Planning and Environmental Consultants

Environmental Impact Assessment Report

Seskin Renewables Wind Farm

Chapter 6 - Biodiversity

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6. BIODIVERSITY

6.1 Introduction

This chapter assesses the likely significant effects (both alone and cumulatively with other projects) that the Proposed Development may have on Biodiversity. Mitigation by design was applied to the finalised Proposed Development layout wherever possible to avoid impacts on Biodiversity. This chapter sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified. The residual impacts on biodiversity are then assessed. Particular attention has been paid to species and habitats of ecological importance. These include species and habitats with national and international protection under the Wildlife Acts 1976 (as amended) and EU Habitats Directive 92/43/EEC. Impacts on avian receptors are considered in Chapter 7 of this EIAR. The full description of the Proposed Development is provided in Chapter 4 of this EIAR.

The chapter is structured as follows:

- The Introduction provides a description of the legislation, guidance and policy context applicable to Biodiversity.
- This is followed by a comprehensive description of the ecological survey and impact assessment methodologies that were followed to inform the robust assessment of likely significant effects on ecological receptors.
- A description of the Baseline Ecological Conditions and Receptor Valuation is then provided.
- This is followed by an Assessment of Effects which are described with regard to each phase of the Proposed Development: construction phase, operational phase and decommissioning phase. Potential Cumulative effects in combination with other projects are fully assessed.
- Proposed mitigation and best practice measures to avoid, reduce or offset the identified effects are described and discussed. This is followed by an assessment of residual effects taking into consideration the effect of the proposed mitigation and best practice measures.
- The conclusion provides a summary statement on the overall significance of predicted effects on Biodiversity.

For the purposes of this EIAR:

The Proposed Development will be known as the 'Seskin Renewables Wind Farm'.

- Where the 'Proposed Development' is referred to this encompasses the entirety of the project for the purposes of this EIA in accordance with the EIA Directive.
- Where the 'Proposed Wind Farm' is referred to, this refers to the wind turbines and associated foundations and hard-standing areas, meteorological mast, access roads, temporary construction compounds, underground cabling, borrow pit, spoil management, site drainage, biodiversity enhancement, turbine delivery accommodation areas and all ancillary works and apparatus.
- Where the 'Proposed Grid Connection' is referred to, this refers to the 38kV onsite substation, associated temporary construction compound and 38kV underground cabling connecting to the existing Ballyragget 110kV substation, and all ancillary works and apparatus.
- Where the 'Site' is referred to, this relates to the primary study area for the EIAR, as delineated by the EIAR Site Boundary in green as shown on Figure 1-1 of the EIAR and encompasses an area of approximately 302 hectares.

In addition:

- The 'EIAR Site Boundary' comprises the entire area shown in Figures 6-1 and 6-2 and is also referred to as the 'study area' in this Chapter.
- 'Key Ecological Receptor" (KER) is defined as a species or habitat occurring within the zone of influence of the Proposed Development upon which likely significant effects are anticipated.
- Zones of Influence (ZoI) for individual ecological receptors refers to the zone within which potential effects are anticipated. ZoIs differ depending on the sensitivities of particular habitats and species and were assigned in accordance with best available guidance and through adoption of a precautionary approach.

6.1.1 Requirements for Ecological Impact Assessment

National Legislation

The Wildlife Act, 1976 (as amended), is the principal piece of legislation governing protection of wildlife in Ireland. The Wildlife Act provides strict protection for species of conservation value. The Wildlife Act conserves wildlife (including game) and protects certain wild animals and flora. These species are therefore considered in this report as ecological receptors.

Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites. Only NHAs are designated under the Wildlife (Amendment) Act 2017. NHAs are legally protected from damage from the date they are formally proposed for designation[1]. A list of pNHAs were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future.

The Flora (Protection) Order 2022 (S.I. No. 235) lists the species, hybrids and/or subspecies of flora protected under Section 21 of the Wildlife Acts. It provides protection to a wide variety of protected plant species in Ireland including vascular plants, mosses, liverworts, lichens and stoneworts. Under the Flora Protection Order it is illegal to cut, pick, collect, uproot or damage, injure or destroy species listed or their flowers, fruits, seeds or spores or wilfully damage, alter, destroy or interfere with their habitat (unless under licence).

National Policy

Irelands 4th National Biodiversity Action Plan 2023-2030 (Department of Housing, Local Government and Heritage, 2024) (the "**NBAP**") strives for a "whole of government, whole of society" approach to the governance and conservation of biodiversity. It demonstrates Ireland's continuing commitment to meeting and acting on its obligations to protect Ireland's biodiversity for the benefit of future generations and will implement this through a number of key targets, actions and objectives.

The Wildlife (Amendment) Act 2023 introduced a new public sector duty on biodiversity. The legislation provides that every public body, as listed in the Act, is obliged to have regard to the objectives and targets in the NBAP. The NBAP sets out five key objectives as follows:

- **Objective 1: Adopt a Whole-of Government, Whole of-Society Approach to Biodiversity.** Proposed actions include capacity and resource reviews across Government; determining responsibilities for the expanding biodiversity agenda providing support for communities, citizen scientists and business; and

[1] https://www.npws.ie/protected-sites/nha(accessed January 2025).

mechanisms for the governance and review of this National Biodiversity Action Plan.

- **Objective 2: Meet Urgent Conservation and Restoration Needs.** Supporting actions will build on existing conservation measures. Efforts to tackle Invasive Alien Species will be elevated. The protected area network will be expanded to include the Marine Protected Areas. The ambition of the EU Biodiversity Strategy will be considered as part of an evolving work programme across Government.
- **Objective 3: Secure Nature's Contribution to People.** Actions highlight the relationship between nature and people in Ireland. These include recognising the tangible and intangible values of biodiversity, promoting nature's importance to our culture and heritage and recognising how biodiversity supports our society and our economy.
- **Objective 4: Enhance the Evidence Base for Action on Biodiversity.** This objective focuses on biodiversity research needs, as well as the development and strengthening of long-term monitoring programmes that will underpin and strengthen future decision-making. Action will also focus on collaboration to advance ecosystem accounting that will contribute towards natural capital accounts.
- **Objective 5: Strengthen Ireland's Contribution to International Biodiversity Initiatives.** Collaboration with other countries and across the island of Ireland will play a key role in the realisation of this Objective. Ireland will strengthen its contribution to international biodiversity initiatives and international governance processes, such as the United Nations Convention on Biological Diversity.

In addition, the National Biodiversity Data Centre published guidance on Pollinator-friendly management of Wind Farms[2]. This identifies an evidence-based action plan for wind farm operators that can help pollinators by employing changes to existing management strategies.

Such policies have informed the evaluation of ecological receptors recorded within the site and the ecological assessment process. Pollinator friendly measures have been incorporated into the Proposed Development, and these are detailed within the Biodiversity Management and Enhancement Plan (BMEP) (see Appendix 6-4).

European Legislation

Habitats and species of European importance are provided legal protection under the EU Habitats Directive 92/43/EEC (the Habitats Directive) and the EU Birds Directive 2009/147/EC (the Birds Directive). This legislation forms the cornerstone of Europe's nature conservation within the EU. It is built around two pillars: the Natura 2000 network of protected sites (hereafter referred to as European sites[3]) and the strict system of species protection. Both the Habitats and Bird Directives have been transposed into Irish law by Part XAB of the Planning and Development Acts 2000 (as amended) (from a land use planning perspective) and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011).

Annex I of the Habitats Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. marsh fritillary, Atlantic salmon, and Killarney fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as lesser horseshoe bat and otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex

[2] https://pollinators.ie/wp-content/uploads/2022/12/Wind-Farm-Pollinator-Guidelines-2022-WEB.pdf *(accessed January 2025).*
[3] *The term Natura 2000 network was replaced by 'European site' under the EU (Environmental Impact Assessment and Habitats) Regulations 2011 S.I. No. 473 of 2011.*

V include Irish hare, common frog and pine marten. Species can be listed in more than one Annex, as is the case with otter and lesser horseshoe bat which are listed on both Annex II and Annex IV. The disturbance of species under Article 12 of the Habitats Directive (and in particular avoidance of deliberate disturbance of Annex IV species, particularly during the period of breeding, rearing, hibernation and migration and avoidance of deterioration or destruction of breeding sites or resting places) has been specifically assessed in this EIAR.

The Birds Directive instructs Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). According to Recital 1 of the Birds Directive, Council Directive 79/409/EEC on the conservation of wild birds was substantially amended several times and in the interests of clarity and rationality, the Birds Directive codifies Council Directive 79/409/EEC. Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3). A subset of bird species has been identified in the Directive and are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

In summary, the species and habitats provided National and International protection under these legislative and policy documents have been considered in this Ecological Impact Assessment. A detailed assessment of the likelihood of the Proposed Development having either a significant effect or an adverse impact on any relevant European Sites (i.e. SACs, cSACs[4], SPAs or cSPAs) has been carried out in the Appropriate Assessment (AA) Screening Report and Natura Impact Statement. A separate assessment has not been carried out in this chapter, to avoid duplication of assessments. However, the relevant conclusions have been cross-referenced and incorporated.

In addition to the above, the following legislation applies with respect to habitats, fauna, invasive species and water quality in Ireland and has been considered in the preparation of this chapter:

- The International Convention on Wetlands of International Importance especially Waterfowl Habitat (Concluded at Ramsar, Iran on 2 February 1971)
- S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 and S.I. No. 722 of 2003 European Communities (Water Policy) Regulations 2003 which give further effect to EU Water Framework Directive (2000/60/EC).
- The following legislation applies with respect to non-native species - Regulation 49 and 50 of European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011).

Kilkenny County Development 2021-2027

The Kilkenny County Development Plan aims to conserve, sustainably manage and enhance the County's natural heritage and biodiversity and to promote understanding of and sustainable access to it. A number of areas in County Kilkenny have been identified as being of exceptional importance for biodiversity at a national and/or international level. These areas are protected through national and European legislation. In addition, certain plant, animal and bird species found in the county are considered rare or vulnerable and are protected by Irish law.

The Council recognises the important role of the environment through diversity, quality, integrity and quality of life by promoting the protection, conservation and enhancement of the natural environment

[4] *Candidate SAC (cSAC) are afforded the same protection as SACs. The process of making cSAC into SACs by means of Statutory instrument has begun and while the process if ongoing the term SAC will be used to conform with nomenclature used in the National Parks and Wildlife Services (NPWS) databased. The name cSPAs applies to candidate SPAs.*

and will promote appropriate enhancement of the natural environment as an integral part of all development.

Chapter 9 of the Plan (Heritage, Culture and the Arts) covers policies and objectives in relation to biodiversity. The Plan acknowledges that much of the county's biodiversity occurs in the wider countryside in areas not subject to legal protection. The Plan acknowledges the importance of linear and other habitat features (ditches, hedgerows, stonewalls, ponds, woodlands etc.) in particular and their importance in providing vital links and corridors to allow the movement of plant and animal species between networks of protected sites and the wider County. Objectives in relation to biodiversity related to the identification of sites of importance for biodiversity and green infrastructure/corridors as follows:

- **Objective 9A:** Continue to identify and map habitats and green infrastructure of county importance and raise awareness and understanding of the county's natural heritage and biodiversity identifying green corridors and measures to connect them.
- **Objective 9B:** To identify and map green infrastructure assets and sites of local biodiversity value over the lifetime of the Plan.

Other relevant local biodiversity action plans were also reviewed including Durrow Biodiversity Action Plan 2023 – 2028.

Laois County Development Plan 2021-2027

The Laois County Development Plan aims to contribute towards the protection, conservation and management of biodiversity and natural heritage including sites designated at national and EU level and protected species and habitats outside of designated sites and to develop a green infrastructure network in the interests of the proper planning and sustainable development of the county. Laois has a wide range of habitat types and landscapes supporting diverse species both in natural and semi-natural state and managed locations. Natural Heritage Areas includes the upland area of the Slieve Bloom Mountains, scenic river valleys of the Barrow and Nore, woodlands, rolling farmland and a network of mature biodiversity areas such as boglands, riparian habitats and hedgerows.

The Plan recognises the need to conserve and enhance the biodiversity of our protected habitats and species including landscape and heritage protection, to identify, protect and enhance our Green Infrastructure, to ensure the sustainable management of our natural resources, to build climate resilience, to support the transition to a low carbon economy by 2050 and the protection of the healthy natural environment to ensure clean air and water for all. Chapter 11 of the Plan deals with Biodiversity and Natural Heritage policies and objectives. A range of objectives are identified, of relevance to this Biodiversity chapter are the following objectives:

- **Policy Objective BNH 1:** To protect, conserve, and seek to enhance the county's biodiversity and ecological connectivity.
- **Policy BNH 13:** It is a policy objective of the Council to require new developments to identify, protect and enhance ecological features by making provision for local biodiversity (for example, through provision of swift boxes or bricks, bat roost boxes, green roofs, etc.) and improve the ecological coherence of wider green infrastructure.

Durrow Biodiversity Action Plan 2023 – 2028

Durrow Biodiversity Action Plan, compiled with and for the local community of Durrow, aims to provide guidance in the enhancement, restoration and protection of its natural heritage. Durrow with surrounding rivers and woodlands, is a biodiversity haven and this plan will help in maximising the benefits that nature can provide while creating awareness for all. Targets in relation to green infrastructure / corridors as follows:

- **Target 1.13:** Make more room for biodiversity in the farmland in the surrounding landscape.

- **Target 1.14:** Protect and strengthen existing features of biodiversity importance and links between them.

6.1.2 Review of Relevant Guidance and Sources of Consultation

The assessment methodology is based primarily upon the National Road Authority (NRA)*'s Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2* (NRA, 2009a) and the survey methodology is based on the NRA *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes* (NRA, 2009b). Although these survey methodologies relate to road schemes, these standard guidelines are recognised survey methodologies that ensure good practice regardless of the development type.

In addition, the following guidelines were consulted in the preparation of this document to provide the scope, structure and content of the assessment:

- *Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018).

This assessment has been carried out in accordance with the Environmental Impact Assessment guidance as outlined in Chapter 1 of the EIAR.

This assessment has been prepared with respect to the various planning policies and strategy guidance documents listed below:

- Laois County Development Plan 2021-2027.
- Kilkenny City and County Development Plan 2021-2027
- Local Biodiversity Actions Plans (as noted in Section 6.1.1. above)
- Regional Spatial and Economic Strategy for the Southern Region.
- National Planning Framework. Ireland 2040 Our Plan.
- National Development Plan 2021-2030.

6.1.3 Statement of Authority

This EIAR chapter has been prepared by Ciara Hackett (B.Sc. Zoology) and reviewed by Corey Cannon and Caroline Kelly. Corey is a Project Director (Ecology) at MKO and holds a BSc in Zoology and an MSc in Biodiversity Survey. Corey is also a Chartered Ecologist and Full Member of CIEEM. Corey has over 12 years' consultancy experience. Caroline is a Senior Ecologist at MKO and holds a BSc. In Environmental Biology, an MSc. In Applied Ecological Assessment and an Advanced Postgraduate Diploma in Planning and Environmental Law. She has over 9 years' professional experience.

The baseline ecological surveys were undertaken by MKO ecologists Ciara Hackett, David Mesarcik (BSc. Ecology & Evolutionary Biology), Ellen Tuck (B.Sc. Environmental Science), Corey Cannon, Rudraksh Gupta (B.Sc, M.Sc. Biodiversity and Conservation), Timothy O'Ceallaigh (B.Sc., Environmental Science) and Katy Beckett (B.A Environmental Science, MSc. Biodiversity and Conservation). Aquatic surveys were undertaken by Aran Von Der Geest Moroney (B.Sc. Ecology and Environmental Biology) and Niamh Rowan (B.Sc. Biological Sciences). Bat habitat assessment and activity surveys were led by Ryan Connors. Bat survey scope development and project management was overseen by Aoife Joyce (BSc., MSc.) (see further details in Bat Report (Appendix 6-2)).

6.2 Methodology

The following sections describe the methodologies followed to establish the baseline ecological condition of the site and surrounding area. Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to, and at the time of, the project proceeding. Ecological Baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

6.2.1 Desk Study

The desk study undertaken for this assessment included a thorough review of available ecological data including the following:

- Review of NPWS Article 17 maps 2019, 2013 and 2007.
- Review of online web-mappers: National Parks and Wildlife Service (NPWS)[5], EPA maps[6], Water Framework Directive (WFD) and Inland Fisheries Ireland (IFI)[7].
- Inland Fisheries Ireland (IFI) Reports.
- Data on potential occurrence of rare plant and bryophytes – as per NPWS online map viewers; Flora Protection Order 2022 Map Viewer[8].
- Review of the Bat Conservation Ireland (BCI) Private Database.
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper.
- Review of specially requested records from the NPWS Rare and Protected Species Database for the hectads in which the Proposed Development is located. (Note: The Proposed Development is located entirely within hectad S47)
- Potential for cumulative effects have been considered in Chapter 2 of this EIAR and Section 6.6 of this Chapter. This was informed by a review of the EIARs/NISs prepared for other plans and projects occurring in the wider area.

6.2.1.1 Designated Sites

6.2.1.1.1 *Identification of the Designated Sites within the Likely Zone of Influence (ZOI) of the Proposed Development*

The potential for the Proposed Development to impact on sites that are designated for nature conservation was considered in this Biodiversity Chapter.

Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under the EU Habitats Directive and EU Birds Directive, respectively and are collectively known as 'European Sites'. The potential for significant effects and/or adverse impacts on the integrity of European Sites is fully assessed in the AA Screening Report and Natura Impact Statement that accompanies this application. As per EPA Guidance 2022, *"a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement"* but should *"incorporate their key findings as available and appropriate"*. Section 6.5.5 of this EIAR provides a summary of the key assessment findings with regard to European Designated Sites.

[5] https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba *Accessed 21/03/2025*
[6] https://gis.epa.ie/EPAMaps/ *Accessed: 21/03/2025*
[7] https://ifigis.maps.arcgis.com/apps/webappviewer/index.html?id=9a31fedb077c4fb29911184842b7ef025 *Accessed 21/03/2025*
[8] https://heritagedata.maps.arcgis.com/apps/webappviewer/index.html?id=a41ef4e10227499d8de17a8abe42bd1e *Accessed: 21/03/2025*

Natural Heritage Areas (NHAs) are designated under Section 18 the Wildlife (Amendment) Act 2000 and their management and protection is provided for by this legislation and planning policy. The potential for effects on these designated sites is fully considered in this Biodiversity Chapter.

Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these designated sites is fully considered in this Biodiversity Chapter.

The following methodology was used to establish which sites that are designated for nature conservation have the potential to be impacted by the Proposed Development:

- All designated sites within the vicinity of the Proposed Development site were identified. In addition, the potential for connectivity with European or Nationally designated sites at greater distances from the Proposed Development was also considered in this initial assessment.
- The designation features of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report.
- Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Influence and further assessment is required.

6.2.1.2 NPWS Article 17 Reporting

A review of the Irish Reports for Article 17 of the Habitats Directive (92/42/EEC), including the Heath, Bogs and Mires, Irish Semi-Natural Grassland Survey datasets, National Survey of Native Woodlands and Ancient and Long-Established Woodland datasets was carried out as part of this assessment.

6.2.2 Scoping and Consultation

MKO undertook a scoping exercise during preparation of this EIAR, as described in Chapter 2, Section 2.7 of this EIAR.

Copies of all scoping responses are included in Appendix 2-1 of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this chapter. Table 2-6 in Chapter 2 of this EIAR describes where the comments raised in the scoping responses received have been addressed in this assessment. Table 6-1 provides a list of the organisations consulted with regard to biodiversity during the scoping process, and notes where scoping responses were received.

Table 6-1 Organisations consulted with regard to biodiversity.

Consultee	Date	Response	Section Where Item is Addressed
Department of Agriculture, Food and the Marine (DAFM)	07/06/2024	Response from the felling division: *"The developer must obtain a Felling License from The Department for Agriculture, Food, and the Marine before trees are felled or removed. The developer should take note of the contents of Felling and Reforestation Policy document which provide a consolidated source of information on the legal and regulatory framework relating to tree felling."*	N/A
An Taisce	No date	No response received to date	N/A
Bat Conservation Ireland	15/05/2024	Unfortunately, as Bat Conservation Ireland is a very small organisation, with limited resources, we do	N/A

		not have the capacity to get involved in planning issues.	
Birdwatch Ireland	No date	No response	N/A
Kilkenny County Council (Heritage Officer)	No date	No response.	N/A
Kilkenny County Council – Environment Department	No date	No response.	N/A
Laoise County Council (Heritage Officer)	No date	No response.	N/A
Laois County Council - Environment Department	No date	No response.	N/A
Department of the Environment, Climate and Communications	31/05/2024	No response.	N/A
Inland Fisheries Ireland	17/05/2024	IFI requests that: • Baseline ecological assessments of water courses potentially affected by the proposed development, including fish species as well as other biological and physico-chemical surveys. • Maps of all aquatic habitats potentially affected by the project, including all drainage channels (temporary and permanent) potentially impacted by the proposed development. • An assessment of the potential adverse effects of the proposed works on all relevant aquatic receptors, including fish. • Assessments should cover area of the proposed development and the potential upstream and downstream impacts. • An assessment of the cumulative effects of the proposed development along with other existing or approved projects. • The proposed mitigation measures to prevent erosion from soil disturbance in excavation areas and areas where there is significant movement of plant and machinery.	• See Section 6.4.8 and Appendix 6-3 • See Figures 1-1 and 1-2 in Appendix 6-3 • See Section 6.5 • See Section 6.5 • See Section 6.6 • See Chapter 9 Hydrology for detailed mitigation measures
Irish Red Grouse Association	No date	No response.	N/A

Irish Raptor Study Group	No date	No response.	N/A
Irish Wildlife Trust (IWT)	No date	No response.	N/A
Waterways Ireland	03/05/2024	No response.	N/A

6.2.3 Field Surveys

A comprehensive survey of the biodiversity within the Proposed Development site was undertaken to inform this Biodiversity Chapter of the EIAR. The following sections fully describe the ecological surveys that have been undertaken and provide details of the methodologies and guidance followed. Surveys were carried out between April 2024 and January 2025 and are summarised in Table 6-2 below. Bat walkover surveys, as well as an assessment of bat foraging, commuting and roosting habitat, were carried out throughout 2023 and 2024. Further detail on bat surveys carried out within the Proposed Development site are included in the Bat Report in Appendix 6-2. All survey data was recorded in the field using ArcGIS Field Maps app.

Table 6-2: Ecology Surveys Informing the EIAR

Survey Type	Dates	Detailed Survey Findings
Multi-disciplinary walkover (incl. habitats)	• 30.04.2024 • 01.05.2024	Chapter 6 (Section 6.4)
Detailed Botanical Surveys – Irish Vegetation Classification (IVC)	• 30.04.2024 • 01.05.2024	Botanical Report, Appendix 6-1
Hedgerow Condition Assessments	• 28.05.2024 • 29.05.2024 • 11.06.2024 • 12.06.2024 • 17.07.2024 • 18.07.2024	Botanical Report, Appendix 6-1
Badger/Mammal survey and camera trap set up	Camera traps deployed: • 28.05.2024 • 11.06.2024 • 24.06.2024 • 19.12.2024 Camera traps collected: • 11.06.2024 • 24.06.2024 • 17.07.2024 • 14.01.2025	Chapter 6 (Section 6.4)
Bryophyte/spring survey	• 24.06.2024	Chapter 6 (Section 6.4)
Marsh fritillary survey	• 27.08.2024	Chapter 6 (Section 6.4)
Bat Surveys	• Various (detailed in Bat Report)	Bat Report, Appendix 6-2
Bird Surveys	• Various (Detailed in Chapter 7, Ornithology)	Chapter 7 (Ornithology)

Aquatic surveys (including otter)	• 03.07.2024 • 04.07.2024 • 05.07.2024	Aquatics Report, Appendix 6-3
Dedicated Otter Survey (Grid Connection)	• 19.12.2024	Chapter 6 (Section 6.4)

6.2.3.1 Multi-disciplinary Walkover Surveys

Multidisciplinary walkover surveys were undertaken within the Proposed Development site. Surveys were undertaken within the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith *et al.*, 2011). A comprehensive walkover of the entire Proposed Development site was completed with incidental records also incorporated from other dedicated species/habitat specific surveys. During the multidisciplinary surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was conducted.

The walkover surveys were also designed to detect the presence, or likely presence, of a range of protected species. The survey included a search for mammal signs (bats, badger, red squirrel etc.) and areas of suitable habitat to support these species, potential features likely to be of significance to bats and additional habitat features for the full range of other protected species that are likely to occur in the vicinity of the Proposed Development (e.g. otter etc.). Bird species observed during the multi-disciplinary surveys were also recorded.

The multi-disciplinary walkover surveys comprehensively covered the entire study area and based on the survey findings, further detailed targeted surveys were carried out for features and locations of ecological significance. Other targeted surveys undertaken within the Proposed Development site are described in the following subsections.

6.2.3.2 Dedicated Habitat and Vegetation Composition Surveys

All habitats recorded on site and described in this Biodiversity chapter have been classified in accordance with Fossitt (2000). Full details of all the botanical surveys and results are provided in Appendix 6-1 and an assessment of the potential for the site to support Annex I habitats is also provided in this Appendix.

Detailed botanical surveys/relevé assessments of the Proposed Development were also undertaken throughout multidisciplinary walkover surveys carried out in 2024. These surveys provided an understanding of the baseline and informed further survey work following finalisation of the Proposed Development layout.

The habitat assessment surveys described in this report have been undertaken with reference to the following guidelines and interpretation documents:

- Commission of the European Communities (2013) *Interpretation manual of European Union habitats*. Eur 28. European Commission DG Environment.
- NPWS (2019). *The Status of EU Protected Habitats and Species in Ireland*. Volume 2: *Habitat Assessments*. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill
- Martin, J.R., O'Neill, F.H. & Daly, O.H. (2018), *The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats*. Irish Wildlife Manuals, No.

102. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.
- O'Neill, F.H., Martin, J.R., Devaney, F.M. & Perrin, P.M. (2013), *The Irish semi-natural grasslands survey 2007-2012*. Irish Wildlife Manuals, No. 78. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.
- Plant nomenclature for vascular plants follows '*New Flora of the British Isles*' (Stace, 2010).

6.2.3.2.1 Vegetation composition assessment

Detailed habitat classification and assessment was undertaken by MKO at targeted locations within the site, with relevés undertaken within representative habitats at each turbine base and associated Proposed Wind Farm infrastructure, see Appendix 6-1 for all relevé data. The extent of each habitat on site was mapped. A representative photograph was also taken for each of the habitats recorded on site, including all relevés. The location of all quadrats is shown in Appendix 6-1.

The survey results were then analysed in accordance the Irish Vegetation Classification (IVC) system. The IVC is a project with aims to classify, describe, and map in detail all aspects of natural and semi-natural vegetation in Ireland within a single, unified framework. The National Vegetation Database (NVD), upon which the IVC is based, holds data for over 30,000 relevés and is the core resource upon which the classification system is based.

A fundamental requirement of the IVC is to *"aid in definition and identification of EU Habitat Directive (92/43/EEC) Annex I habitats*" and to '*inform the planning process, for example through environmental impact assessments*'.

The Engine for Relevés to Irish Communities Assignment (ERICA)[9] is a web application for assigning vegetation data to communities defined by the Irish Vegetation Classification (IVC). Data can be uploaded, checked for errors and analysed and the results can then be downloaded. ERICA works with both quantitative vegetation cover data (such as are recorded in relevés and other types of botanical recording plots) and presence/absence data, such as species lists. ERICA covers grasslands, woodland, duneland, heaths, bogs, fens, mires, freshwater, saline waters, rocky habitats, scrub, strandline, saltmarsh and weed communities (Perrin *et al.*, 2018). The data collected from the botanical assessments was uploaded to ERICA, analysed and the results data downloaded.

The analysis procedure uses a clustering process to assign classification affinity to vegetation plots based on a degree of membership to each of the communities defined by the IVC. Table 6-3 details the categorizing types of plots utilising the clustering analysis. This categorizing procedure was utilised to determine if the grassland plots within the study area had any affinity to Annex I grassland and whether further assessment was required.

Table 6-3: Categorising types of plots using clustering analysis (after Wiser & de Cáceres, 2013).

Plot Type	Definition
Assigned	The plot has membership ≥ 0.5 for one of the vegetation communities and therefore relates to the core definition of that vegetation community.
Unassigned	The plot has membership ≥ 0.5 for the noise class and is poorly represented by the current classification scheme
Transitional	The plot has membership < 0.5 for all vegetation communities and for the noise class. It falls within the scope of the current classification scheme but does not relate to the core definition of any of the vegetation communities.

[9] *Perrin, 2019, ERICA – Engine for Relevés to Irish Communities Assignment V5.0 User's Manual, Online, Available at: https://biodiversityireland.shinyapps.io/vegetation-classification/_w_9cd4889a/manual.pdf, Accessed: 10.10.2020*

Habitats considered to be of ecological significance and in particular having the potential to correspond to those listed in Annex I of the EU Habitats Directive where present were identified and classified as KERs.

6.2.3.3 Hedgerow Appraisal System (HAS)

Hedgerows within the Proposed Development site were assessed using a method adapted from the Hedgerow Appraisal System (Foulkes et al., 2013). This methodology was used to record the extent (i.e. quantitative survey) floristic composition, context, physical structure, condition, and management of hedgerows (i.e. qualitative survey) on the site. This detailed survey methodology for hedgerows was applied to hedgerows within the footprint of the Proposed Development with potential to be impacted (i.e. those hedgerows that fall within the bat felling buffers around each of the turbines and other associated infrastructure (turbine hardstand, road infrastructure etc.). Prior to the initial ecological site visit, all hedgerows identified within the development footprint were mapped using landcover data from *Tailte Éireann's National Land Cover Map 2018 (*Lydon and Smith, 2018*)*. The hedgerows identified were also checked against the *1st Edition Ordnance Survey map (1841)* to identify whether they followed Townland Boundaries. Two definitions of hedgerows are used when applying the HAS. Murray and Foulkes (2006) define hedges or hedgerows as:

"Linear strips (4m wide or less) of woody plants with a shrubby growth form that cover more than 25% of the length of a field or property boundary that have been deliberately established or managed. They often have associated banks, walls, ditches (drains), or trees."

Hedges that have developed into lines of trees which no longer display a shrubby growth form (remnant hedgerows) are also considered for recording purposes. In order to maintain consistency with other habitat surveys in the Republic of Ireland, hedgerows meeting the following definition of Fossitt (2000) were also recorded (abbreviated):

Hedgerows WL1*: Linear strips of shrubs, often with occasional trees, that typically form field or property boundaries. Dimensions of hedgerows are taken here as being mainly less than 5m high and 4m wide. When wider or taller than this, or dominated by trees, the habitat should be considered as a narrow strip of scrub or woodland, or as a treeline -* ***WL2****. Some hedgerows may be overgrown or fragmented if management has been neglected, but they should still be considered in this category unless they have changed beyond recognition. Linear strips of low scrub are included in this category if they occur as field boundaries.*

Hedgerows were surveyed at 30m intervals and labelled with unique identifiers on Fieldmaps and data on each hedgerow collected using a proforma set up on Survey 1,2, 3 database. The following attributes covered by the *HAS Methodology* (Foulkes *et al.,* 2013) were recorded for each 30m sample strip.

Context

Hedgerows were assessed by location, aspect, farm type, and surrounding environment, including adjacent land and habitat links. The purpose of recording these factors was to enable assessment of the potential significance of the surrounding landscape on hedgerow ecology and the structure of the hedge, as distinct from other influences such as management.

Construction

Each hedgerow's construction was determined by its linearity and features like drains, banks, and walls. These characteristics can be indicative of the period of hedgerow origin and are largely of a fixed nature and unlikely to change over time.

Structure and Condition

The structure relates to the physical dimensions of the hedge (height, width, cross sectional profile, quantity and age profile of trees). Condition was assessed by gaps, basal growth density (i.e. in the bottom metre of the hedge), bank erosion and overall vigour. These attributes can vary significantly over time and, where repeat surveys are undertaken, can be the main indicators of quality and condition. Furthermore, by assessing trends, the long-term sustainability of the hedgerow can be determined.

Management

This covers the type and method of hedgerow management, including flailing, laying, coppice management, short- and long-term absence of management, and evidence of past management of the hedge.

Floristic Data

Species were recorded from the 30-metre strips. Hedgerows were categorised into three layers;

a) **Tree layer** - Hedgerow trees are any trees within the hedge that have been deliberately or incidentally allowed to grow, as distinct from the shrub layer of the hedge.

b) **Shrub layer** - The shrub (understorey) layer includes shrubs such as thorns, woody climbers and tree species that have a shrubby growth form, normally due to management such as cutting or laying.

c) **Ground flora** - This includes all herbaceous broadleaved plants, grasses, rushes and ferns found in the hedge bottom, some of which may be indicators of hedgerow age or origin (e.g. derived from scrub, old or ancient woodland). The list of ground flora species to be recorded followed that outlined in Appendix E of the HAS (Foulkes et al., 2013).

Hedgerow Significance

Following data collection the appraisal system was used to identify hedgerows of historical, ecological, or landscape significance and assess their condition based on the recorded data. The system ranks hedgerows on a scale of 0 - 4 (0 being lowest) across five categories: Historical Significance, Species Diversity, Structure/Construction and Associated Features, Habitat Connectivity, and Landscape Significance. A score of 4 in any category indicates a hedgerow of high significance (Heritage Hedgerow). Hedgerows can also be classified as high significance if they score 6 or more in the Historical, Species Diversity, or Structural categories, or a total score of 16 or more across all five categories. These hedges should be prioritised for retention and management. Hedges with lower scores may still hold value depending on the context. The assessment criteria used to determine hedgerow significance by Foulkes *et al.*, 2013 is detailed within Appendix 6-1.

6.2.3.4 Terrestrial Fauna Surveys

The results of the desk study, scoping replies, incidental records of protected species during ecological survey work and multidisciplinary walkover surveys were used to inform the scope of targeted ecological surveys required. Dedicated surveys for badger, otter, and marsh fritillary were undertaken on the dates set out in Section 6.2.3. above, with the methodologies followed also provided in the following sections. Dedicated surveys for bats were undertaken across the site and are detailed in the Bat Report in Appendix 6-2. During the multidisciplinary walkover surveys, where observed, incidental records of other fauna, invertebrates etc. were recorded.

6.2.3.4.1 Badger Survey

The badger survey was conducted adhering to best practice guidance (NRA, 2009b) and CIEEM best practice competencies for species surveys[10]. Areas identified as providing potential habitat for badger were subject to specialist targeted survey. The badger survey aimed to determine the presence or absence of badger within Proposed Development site and wider survey area. This involved a search for all potential badger signs (latrines, badger prints, mammal tracks and setts). Where potential setts were identified these were mapped and classified according to their status (i.e. main, annexe, subsidiary, outlier) and level of usage (disused, well-used, active). Where setts were identified as potentially being used/active camera traps were set up to confirm if they were in active use by badger. The badger survey was not constrained by vegetation given the nature of the habitats within the site and the timing of the surveys.

6.2.3.4.2 Otter Survey

Otter surveys were conducted adhering to best practice guidance (NRA, 2009b) and CIEEM best practice competencies for species surveys[11]. Otter surveys were undertaken during the detailed aquatic surveys in July. All watercourses considered to provide potential habitat for otter and were subject to targeted surveys for this species. This involved a search for all otter signs (e.g. spraints, scat, prints, slides, trails, couches and holts). Due to the quantity of otter signs recorded during the initial surveys along the River Nore an additional dedicated otter survey was undertaken in the winter season when vegetation had died back to ensure any potential resting sites (holts/couches) could be identified.

6.2.3.4.3 Marsh Fritillary Surveys

Taking account of the findings of the desk study, which showed records of marsh fritillary in hectad S47, and following the identification of suitable habitat for this species (e.g. presence of devil's-bit scabious) within the Proposed Wind Farm site during baseline ecological walkover surveys, targeted larval web surveys for the species were undertaken. The surveys were undertaken within the optimal period i.e. August – September, on dry days, with no rain and no to little wind. The survey methodology followed best practice guidance (NRA, 2009b). Suitable marsh fritillary habitat was identified and is shown in Figure 6-9 and a systematic search of the area to locate larval webs was undertaken.

6.2.3.4.4 Bat Surveys

Detailed description of the survey methodologies undertaken in relation to bats is provided in the Bat Report included in Appendix 6-2 of this EIAR, together with full details of the survey times and the surveyors who carried out the bat survey and assessment work.

Survey design and effort in 2022 was created in accordance with the best practice guidelines available, '*Bat Surveys: Good Practice Guidelines'* prepared by the Bat Conservation Trust (Collins 2016). Surveys undertaken were undertaken in accordance with those prescribed in NatureScot (2021) '*Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*'. This is in line with standard best practice industry guidelines.

6.2.3.5 Aquatic surveys

The aquatic baseline assessment focused on aquatic ecology including fisheries and biological water quality, as well as protected aquatic species and habitats in the vicinity of the Proposed Development.

[10] *CIEEM, 2013, Technical Guidance Series – Competencies for Species Survey: Badger, Online, Available at: https://cieem.net/wp-content/uploads/2019/02/CSS-BADGER-April-2013.pdf*
[11] *CIEEM, 2013, Technical Guidance Series – Competencies for Species Survey: Otter, Online, Available at: https://cieem.net/wp-content/uploads/2019/02/CSS-EURASIAN-OTTER-April-2013.pdf*

Undertaken on a catchment-wide scale, the baseline surveys focused on the detection of freshwater habitats and species of high conservation value. These included river habitat assessments, surveys for white-clawed crayfish (*Austropotamobius pallipes*), freshwater pearl mussel (*Margaritifera margaritifera*) (eDNA only), macro-invertebrates (biological water quality), otter, and fish species, inclusive of supporting nursery and spawning habitat. The surveys also documented macrophyte and aquatic bryophyte communities including Annex I habitat associations where present. This holistic approach informed the overall aquatic ecological evaluation of each site in context of the Proposed Development and ensured that any habitats and species of high conservation value would be detected. Full details of the methodology followed for the aquatic surveys as well as details of the locations of survey sites is provided in the Aquatic Baseline Report, Appendix 6-3. Aquatic survey locations are shown in Figure 1-1 and 1-2 of the Aquatics Report and the survey locations are referenced throughout this report as WF 1, WF 2, WF 3, WF 4, WF 5, WF 6, WF 7, and GC 1.

6.2.3.6 Karst Features (Spring)

A botanical survey of an identified spring (associated with a swallow hole) north of Turbine 6 was undertaken to determine if the spring could potentially correspond to the Annex I habitat Petrifying springs with tufa formation (7220). This Annex I habitat type consists of bryophyte dominated springs with tufa (a porous rock made of calcium carbonate) formation. Bryophytes (mosses and liverworts) and certain vascular plants can be used to indicate the ecological value and condition of petrifying springs. The list of indicator species can be found in *Guidelines for the Assessment of Annex I Priority Petrifying Springs in Ireland* (Denyer et al., 2023).

Surveys were also undertaken by Hydro-Environmental Services (HES) to test if calcium carbonate deposit (tufa) was present at the spring using 10% hydrochloric acid. The presence/absence of tufa is a determining factor for this to be considered the priority Annex I habitat, Petrifying Soring with Tufa Formation [7220].

6.2.4 Methodology for Assessment of Impacts and Effects

6.2.4.1 Identification of Target Receptors and Key Ecological Receptors

The criteria used to assess the ecological value and significance of the study area for habitats and species present follows *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA,2009a) and *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018).

6.2.4.2 Valuing Ecological Receptors

The importance of the ecological features identified within the study area was determined with reference to a defined geographical context. This was undertaken following a methodology that is set out in Chapter 3 of the NRA guidelines. These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

- International
- National
- County
- Local Importance (Higher Value)
- Local Importance (Lower Value)

The guidelines clearly set out the criteria by which each geographic level of importance can be assigned. Internationally Important sites are either designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna. Specific criteria for assigning each of the other levels of importance are set out in the guidelines and have been followed in this assessment. Where appropriate, the geographic frame of reference set out above was adapted to suit local circumstances. In addition, and where appropriate, the conservation status of habitats and species is considered when determining the significance of ecological receptors.

In accordance with these guidelines impact assessment is only undertaken of KERs. KERs are within the ZoI of the Proposed Development and are 'both of sufficient value to be material in decision making and likely to be affected significantly'. To qualify as KERs, features must be of Local Ecological Importance (Higher Value) or higher. Features valued at Local Ecological Importance (Lower Value) are not considered to be KERs and therefore not subject to impact assessment. This is not to say that they are of no biodiversity value, but that impacts on these habitat types in their local context are not likely to result in a significant effect on biodiversity. It should be noted that this relates to the impact on the habitat itself as distinct from considering the role these habitat types play in supporting KER fauna species.

6.2.4.3 Characterisation of Impacts and Effects

The Proposed Development will result in a number of impacts. The ecological effects of these impacts are characterised as per the CIEEM '*Guidelines for Ecological Impact Assessment in the UK and Ireland*' (2018). The headings under which the impacts are characterised follow those listed in the guidance document and are applied where relevant. A summary of the impact characteristics considered in the assessment is provided below:

- **Positive or Negative**. Assessment of whether the Proposed Development results in a positive or negative effect on the ecological receptor.
- **Extent**. Description of the spatial area over which the effect has the potential to occur.
- **Magnitude** to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
- **Duration** is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. For example, five years, which might seem short-term in the human context or that of other long-lived species, would span at least five generations of some invertebrate species.
- **Frequency and Timing**. This relates to the number of times that an impact occurs and its frequency. A small-scale impact can have a significant effect if it is repeated on numerous occasions over a long period.
- **Reversibility.** This is a consideration of whether an effect is reversible within a 'reasonable' timescale. What is considered to be a reasonable timescale can vary between receptors and is justified where appropriate in the impact assessment section of this report.

6.2.4.4 Determining the Significance of Effects

The ecological significance of the effects of the Proposed Development are determined following the precautionary principle and in accordance with the methodology set out in Section 5 of CIEEM (2018).

For the purpose of Ecological Impact Assessment (EcIA), 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local (CIEEM, 2018).

When determining significance, consideration is given to whether:

- Any processes or key characteristics of key ecological receptors will be removed or changed.
- There will be an effect on the nature, extent, structure and function of important ecological features.
- There is an effect on the average population size and viability of ecologically important species.
- There is an effect on the conservation status of important ecological habitats and species.

6.2.4.5 Incorporation of Mitigation

Section 6.5 of this Biodiversity chapter assesses the potential effects of the Proposed Development to ensure that all effects on sensitive ecological receptors are adequately addressed. Where significant effects on key ecological receptors are predicted, mitigation is incorporated into the project design or layout to address such effects. The implemented mitigation measures avoid or reduce potential significant residual effects, post mitigation.

6.2.5 Limitations

The information provided in this document accurately and comprehensively describes the baseline ecological environment; provides an accurate prediction of the likely ecological effects of the Proposed Development; prescribes mitigation as necessary; and describes the residual ecological impacts. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines. No significant limitations in the scope, scale or context of the assessment have been identified.

6.3 Establishing the Ecological Baseline

6.3.1 Desk Study

The following sections describe the findings of the desk study. It provides a baseline of the ecology known to occur in the existing environment based on data sources reviewed to inform the ecological impact assessment as outlined in Section 6.2.1.

6.3.1.1 Designated Sites

A map of all the European Sites within the vicinity of the Proposed Development is provided in Figure 6-1 with all Nationally Designated Sites shown in Figure 6-2.

Table 6-4 provides details of all relevant Nationally designated sites initially considered to potentially be within the zone of influence (ZoI) of the Proposed Development. All European Designated Sites are fully described and assessed in the Natura Impact Statement (NIS) submitted with this planning application. In summary, two European sites were identified to be within the ZoI of the Proposed Development, namely:

- River Barrow and River Nore SAC [002162]
- River Nore SPA [004233]

The River Barrow and River Nore SAC and River Nore SPA are located approximately 1.0km and 0.36km, respectively, downstream of the Proposed Development and are hydrologically linked to it via watercourses which drain the site, while the Proposed Grid Connection Route crosses both the River Barrow and River Nore SAC and the River Nore SPA at one point. Potential for likely significant effects was identified in relation to deterioration on water quality (and associated indirect effects on QI species) and potential for direct effects to QI species during construction in the absence of mitigation.

The following pNHA's were identified as being within the likely ZoI of the Proposed Development:

- River Nore / Abbeyleix Woods Complex pNHA [002076]

Table 6-4 Identification of Nationally designated sites within the Likely ZoI

Designated Site	Distance from Proposed Development (km)	Zone of Likely Impact Determination
Natural Heritage Areas (NHA)		
Coans Bog NHA [002382]	13.9km from the Proposed Development site (12.3km from the Proposed Grid Connection Route)	There will be no direct effects as the Proposed Development is located entirely outside the designated site. The NHA is located 13.9km to the east of the Proposed Development site. There is no hydrological link between the NHA and Proposed Development, given this and due to the distance between the Proposed Development and the NHA, and the terrestrial nature of the habitat, there is no potential for any direct or indirect effects on this NHA. **The NHA is considered to be outside the ZoI and no further assessment is required.**
Proposed Natural Heritage Area (pNHA)		
River Nore/ Abbeyleix Woods Complex [002076]	0.33km from the Proposed Development site (0m from the Proposed Grid Connection Route)	This pNHA include the River Nore which is known to support Freshwater Pearl Mussel, Twaite Shad, wet grassland, mixed deciduous woodland of great antiquity and species diversity, with specimen oaks. The Proposed Development site is located entirely outside of this designated site. The Proposed Grid Connection crosses this designated site. However, no instream works are required as part of the Proposed Grid Connection crossing. The watercourse crossing will be by Horizontal Directional Drilling (HDD) the launch pits of which will be located outside any woodland/scrub habitat and located within agricultural lands. However, given the proximity of the works to the river there is potential pathway for impacts on water quality during construction in the absence of mitigation. **A pathway for effect on this pNHA was identified. The site is considered to be within the ZoI of the Proposed Development and is therefore considered further in this assessment.**
The Curragh and Goul River Marsh [000420]	3.5km from the Proposed Development site (5.3km from the Proposed Grid Connection Route)	There is no potential for direct effects as the Proposed Development is located entirely outside of this designated site.

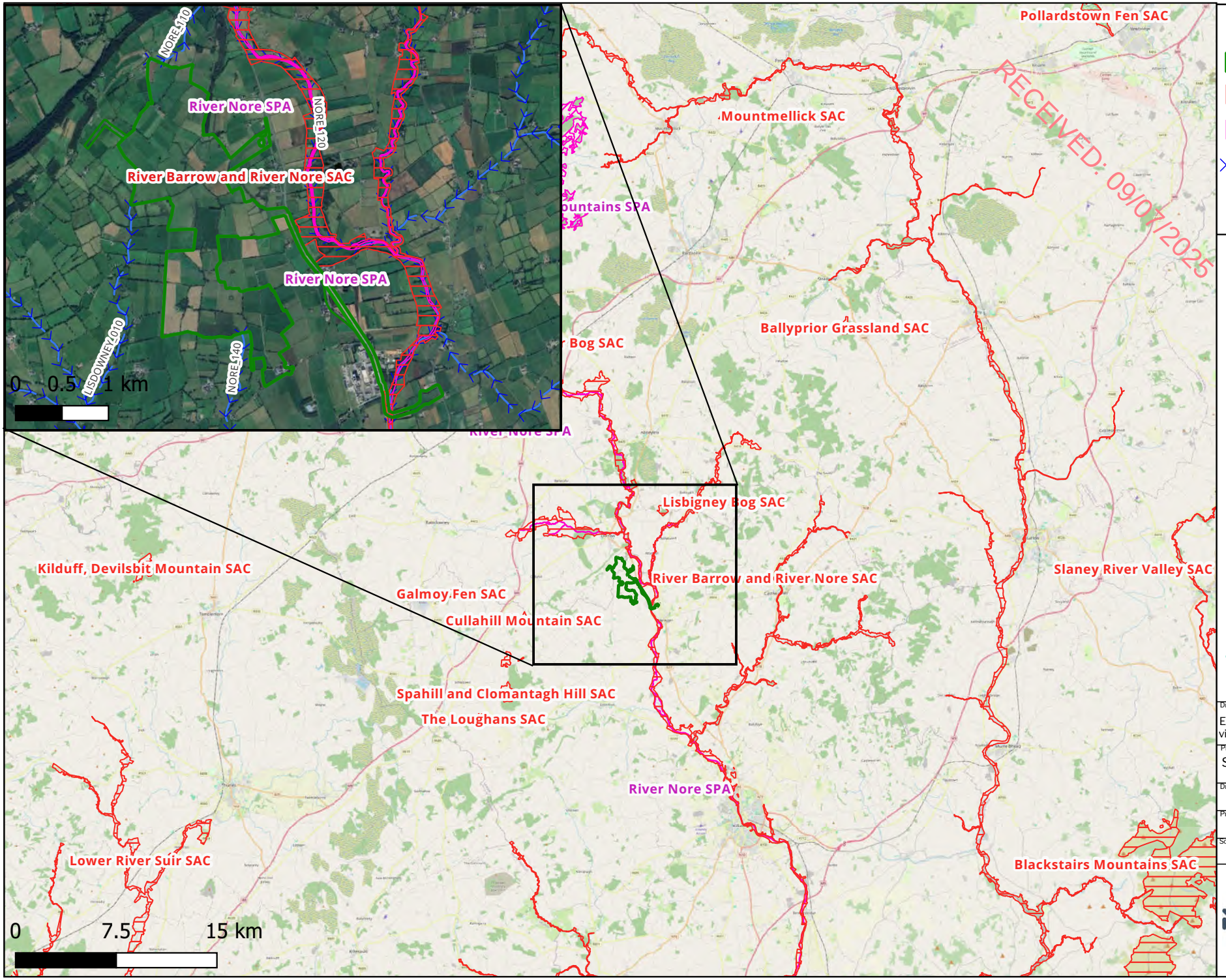
Designated Site	Distance from Proposed Development (km)	Zone of Likely Impact Determination
		This pNHA is designated for wet meadow, river and Greenland white-front geese. There is no hydrological connection between this pNHA and the Proposed Development site. Given this and the due to the distance between the pNHA and the Proposed Development, there is no potential for indirect effects on the pNHA. **The pNHA is considered to be outside the ZoI for the Proposed Development and no further assessment is required.**
Lisbigney Bog [000869]	4.3km from the Proposed Development site (5.1km from the Proposed Grid Connection Route)	There is no potential for direct effects as the Proposed Development is located entirely outside of this designated site. This pNHA is designated for Desmoulin's whorl snail and Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*. There is no hydrological connection between the pNHA and the Proposed Development site. Given this and due to the distance between the Proposed Development, there is no potential for indirect effects on the pNHA. **The pNHA is considered to be outside the ZoI for the Proposed Development and no further assessment is required.**
Inchbeg [000836}	5.4km from the Proposed Development site (4.8km from the Proposed Grid Connection Route)	There is no potential for direct effects as the Proposed Development is located entirely outside of this designated site. Inchbeg pNHA is located in the floodplain of the River Nore south of the Proposed Development site. The main habitats of interest are lowland wet grassland, freshwater marshes, and semi-natural deciduous woodland. There is hydrological connection with this pNHA and the Proposed Grid Connection. However, due to the terrestrial nature of the habitats, there is no potential for indirect effects on the pNHA. **The pNHA is considered to be outside the ZoI for the Proposed Development and no further assessment is required.**
Cullahill Mountain [000831]	6.7km from the Proposed Development site (8.1km from the Proposed Grid Connection Route)	There is no potential for direct effects as the Proposed Development is located entirely outside of this designated site. Culahill Mountain pNHA is designated for semi-natural dry grasslands and scrubland

Designated Site	Distance from Proposed Development (km)	Zone of Likely Impact Determination
		facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites). Given the terrestrial nature of this habitat and the distance between the Proposed Development site and this pNHA, there is no potential for indirect effects on this site. **The pNHA is considered to be outside the ZoI for the Proposed Development and no further assessment is required.**
Esker Pits [000832]	9.3km from the Proposed Development site (7.9km from the Proposed Grid Connection Route)	There is no potential for direct effects as the Proposed Development is located entirely outside of this designated site. This pNHA is a gravel quarry located south-east of the Proposed Development site. The site comprises a mosaic of habitats including species-rich calcareous grassland, dry gravel banks, small ponds, scrub woodland, and marsh areas which are flooded in the winter. There is no hydrological connection between the Proposed Development site and this pNHA. Due to the intervening distance between the Proposed Development and the pNHA, there is no potential for indirect effects on this designated site. **The pNHA is considered to be outside the ZoI for the Proposed Development and no further assessment is required.**
Ardaloo Fen [000821]	9.7km from the Proposed Development site (8.9km from the Proposed Grid Connection Route)	There is no potential for direct effects as the Proposed Development is located entirely outside of this designated site. This pNHA is a wetland area located downstream of the Proposed Development site. There is hydrological connection with this pNHA and the Proposed Grid Connection. However, due to the terrestrial nature of the habitats, there is no potential for indirect effects on the pNHA. **The pNHA is considered to be outside the ZoI for the Proposed Development and no further assessment is required.**
Grantstown Wood and Lough [000417]	8.3km from the Proposed Development site (10.3km from the Proposed Grid Connection Route)	There is no potential for direct effects as the Proposed Development is located entirely outside of this designated site. This pNHA is designated for wet woodland on base-rich soils and is located north-west of the Proposed Development site. There is no hydrological connection between the Proposed Development site and the site. Due to the intervening distance and the lack of

Designated Site	Distance from Proposed Development (km)	Zone of Likely Impact Determination
		hydrological connection, there is no potential for indirect effects on this site. **The pNHA is considered to be outside the ZoI for the Proposed Development and no further assessment is required.**
Cuffsborough [000418]	8.5km from the Proposed Development site (10.5km from the Proposed Grid Connection Route)	There is no potential for direct effects as the Proposed Development site is located entirely outside of this designated site. This pNHA is predominantly improved grassland, and are of little botanical interest, however, the pastures have been used for feeding by Greenland White-fronted Geese. Given the terrestrial nature of this habitat, and the distance between the Proposed Development site and this pNHA, there is no potential for indirect effects on this site. **The pNHA is considered to be outside the ZoI for the Proposed Development and no further assessment is required.**
Coolacurragh Wood [000862]	Approx. 8.7km from the Proposed Development site (10.5km from the Proposed Grid Connection Route)	There is no potential for direct effects as the Proposed Development is located entirely outside of this designated site. This woodland site occurs on fen peat over marl and is dominated by native tree species such as Downy Birch (*Betula pubescens*), Alder (*Alnus glutinosa*), Ash (*Fraxinus excelsior)*, willow (*Salix spp.*) and Holly (*Ilex aquifolium*). Human land use of the wood is of low intensity. Overall, the site appears quite undisturbed and in a semi-natural state. There is no hydrological connection to this Nationally Designated site and given the distance between the Proposed Development site and this pNHA, there is no potential for indirect effects on this site. **The pNHA is considered to be outside the ZoI for the Proposed Development and no further assessment is required.**
Spahill and Clomantagh Hill [000849]	10.3km from Proposed Development site (11.8km from the Proposed Grid Connection Route)	There is no potential for direct effects as the Proposed Development is located entirely outside of this designated site. This Nationally Designated site is designated for semi-natura; dry grasslands and scrubland facies on calcareous substrates. Given the terrestrial nature of this site, the lack of hydrological connectivity, and the intervening distance, there is no potential for indirect effects on this site.

Designated Site	Distance from Proposed Development (km)	Zone of Likely Impact Determination
		The pNHA is considered to be outside the ZoI for the Proposed Development and no further assessment is required.
Dunmore Cave [000401]	Approx 10.8km the Proposed Development site (9.6km from the Proposed Grid Connection Route)	There is no potential for direct effects as the Proposed Development is located entirely outside of this designated site. This pNHA is a fossil cave used by at least 50 Natterer's bats (*Myotis nattereri*) during the summer months. Given the intervening distance between the Proposed Development site and this Nationally Designated site, there is no potential for indirect effects on this site. **The pNHA is considered to be outside the ZoI for the Proposed Development and no further assessment is required.**
Galmoy Fen [001858]	11.7km from the Proposed Development site (13.2km from the Proposed Grid Connection Route)	There is no potential for direct effects as the Proposed Development is located entirely outside of this designated site. Galmoy fen pNHA comprises a cutover raised bog that has become flooded with base-rich groundwater and that now supports alkaline fen vegetation. It lies in a depression and is underlain by Carboniferous limestone. Given the intervening distance between the Proposed Development site and the pNHA and no identified hydrological connectivity, there is no potential for indirect effects on the pNHA. **The pNHA is considered to be outside the ZoI for the Proposed Development and no further assessment is required.**
Shanahoe Marsh [001923]	12.3km from the Proposed Development site (13.9km from the Proposed Grid Connection Route)	There is no potential for direct effects as the Proposed Development is located entirely outside of this designated site. Shanahoe marsh is an area of wet grassland, hay meadow, and freshwater marsh. The main ecological interest of this site is that it is a major feeding and roosting area for a small flock of Greenland white-fronted geese during winter. Given the intervening distance between the Proposed Development site and the pNHA and no identified hydrological connectivity,

Designated Site	Distance from Proposed Development (km)	Zone of Likely Impact Determination
		there is no potential for indirect effects on the pNHA. **The pNHA is considered to be outside the ZoI for the Proposed Development and no further assessment is required.**



Map Legend

- EIAR Site Boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- WFD River Waterbodies

Drawing Title
European Designated Sites within the vicinity of the Proposed Developemnt

Project Title
Seskin Renewables Wind Farm

Drawn By	Checked By
CH	CC
Project No.	Drawing No.
231103	Figure 6-1
Scale	Date
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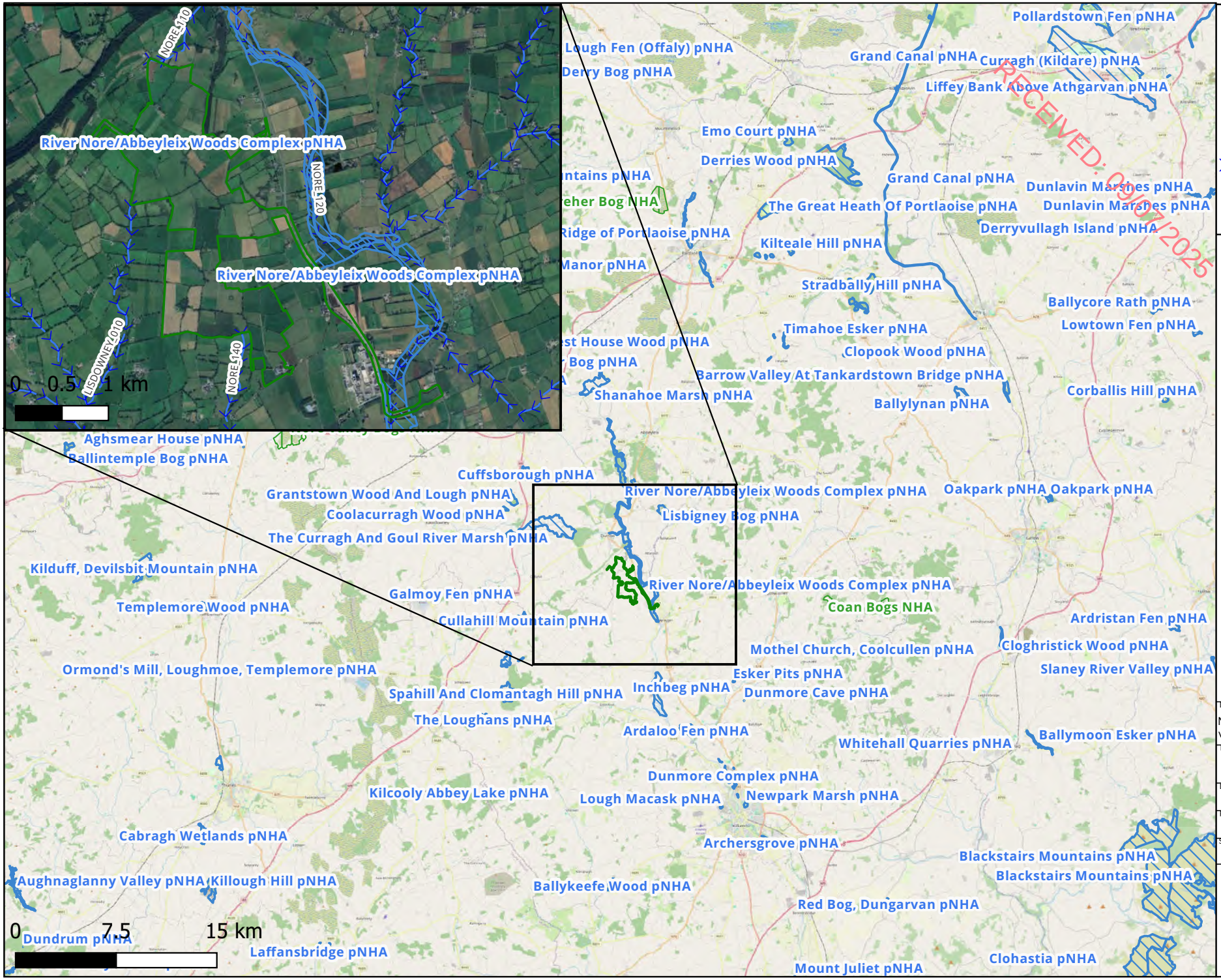

Map Legend

- EIAR Site Boundary
- Natural Heritage Area (NHA)
- Proposed Natural Heritage Area (pNHA)
- WFD River Waterbodies

Drawing Title: Nationally Designated Sites within the vicinity of the Proposed Developemnt

Project Title: Seskin Renewables Wind Farm

Drawn By	Checked By
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231103	Figure 6-2
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6.3.1.2 Annex I Habitats

The most recent NPWS data on the recorded distribution of EU Habitats Directive Annex I listed habitats was reviewed in relation to the Proposed Development.

Available NPWS datasets were downloaded and overlain on the Proposed Development. No polygon or point data contained within datasets was identified within the EIAR Site Boundary. Following a review of the Irish Semi-natural Grasslands Survey (ISGS) no areas of the lands within the EIAR Site Boundary were found to have been surveyed as part of the ISGS.

A 94.5ha area of alluvial woodland is located approx. 0.75km upstream of survey site WF 7, and a further 47ha of alluvial woodland is located 5.8km and 7.2km upstream of the mainstem River Nore confluences with the Erkina and Durrow_Townparks watercourses, along which survey sites WF 7 and WF 6 are located, respectively.

6.3.1.3 New Flora Atlas

A search was carried out on the NPWS web-mapper for records for Vascular Plants, Charophytes and Lichens listed in and legally protected under the Flora (Protection) Order 2022. A search was made in the *New Atlas of the British & Irish Flora* (Preston et al., 2002) to investigate whether any rare or unusual plant species listed as Annex II of the Habitats Directive which are listed as rare on the *Red Data List* (Curtis and McGough 1988) or protected under the Flora (Protection) Order 2022 had been recorded in the relevant 10km squares in which the study site is situated (S47), during the 1987-1999 atlas survey.

The search indicted that no vascular Plants, Charophytes and Lichens listed in and legally protected under the Flora (Protection) Order 2022 have been recorded within or adjacent to the Proposed Development site. The closest recorded is of the species Opposite-leaved pondweed (*Groenlandia densa*) which was recorded in 1991 in S37.

6.3.1.4 Bryophytes

The desktop search (NPWS bryophyte mapper) indicated that no protected bryophytes have been recorded within or adjacent to the Proposed Development site. The closest bryophyte record is of the species *Pallavicinia lyellii*, which was recorded in 1966 in S26.

6.3.1.5 Bats and Birds

Please note the result of desktop studies in relation to bats and birds are detailed in the Bat Report, Appendix 6-2, and Chapter 7 (Ornithology).

6.3.1.6 National Biodiversity Data Centre (NBDC) Records

6.3.1.6.1 Fauna

A search of the NBDC website was conducted to inform survey effort and provide a baseline of likely species composition in the area. Records of protected fauna recorded from hectad S47 are provided in in Table 6-4.

Table 6-4: NBDC records for protected species and species of conservation interest (excl. birds) in hectad S47

Common name	Scientific name	Legal Protection
Common Frog	*Rana temporaria*	Wildlife Act, Annex V
Smooth Newt	*Lissotriton vulgaris*	Wildlife Act
Marsh Fritillary	*Euphydryas aurinia*	Annex II,
White-clawed crayfish	*Austropotamobius pallipes*	Wildlife Act, Annex II, Annex V
Hedgehog	*Erinaceus europaeus*	Wildlife Act,
Otter	*Lutra lutra*	Wildlife Act, Annex II, Annex IV
Pine Marten	*Martes martes*	Wildlife Act, Annex V
Badger	*Meles meles*	Wildlife Act
Irish Hare	*Lepus timidus subsp. hibernicus*	Wildlife Act, Annex V
Daubenton's Bat	*Myotis daubentonii*	Wildlife Act, Annex IV
Natterer's Bat	*Myotis nattereri*	Wildlife Act, Annex IV
Leisler's Bat	*Nyctalus leisleri*	Wildlife Act, Annex IV
Soprano Pipistrelle	*Pipistrellus pygmaeus*	Wildlife Act, Annex IV
Common Pipistrelle	*Pipistrellus pipistrellus*	Wildlife Act, Annex IV
Brown Long-eared Bat	*Plecotus auritus*	Wildlife Act, Annex IV
Red Squirrel	*Sciurus vulgaris*	Wildlife Act
Pygmy Shrew	*Sorex minutus*	Wildlife Act
Desmoulin's Whorl Snail	*Vertigo moulinisiana*	Annex II

Annex II, Annex IV, Annex V – Of EU Habitats Directive, Annex I – Of EU Birds Directive, WA – Irish Wildlife Acts (1976 as amended)

6.3.1.6.2 Invasive Species

The NBDC database also contains records of invasive species identified within the relevant hectads. A number of species subject to restrictions under Regulations 49 and 50 and included in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 were known to be present in hectad S47 as shown in Table 6-5 below.

Table 6-5: NBDC records for invasive species (Hectad S47)

Common Name	Scientific Name
Japanese knotweed	*Reynoutria japonica*[12]
Cherry laurel	*Prunus laurocerasus*
Japanese Rose	*Rosa rugosa*
Budapest Slug	*Tandonia budapestensis*
Common Garden Snail	*Cornu aspersum*
Jenkin's Spire Snail	*Potamopyrgus antipodarum*
Keeled Slug	*Tandonia sowerbyi*
Wrinkled Snail	*Candidula intersecta*
American Mink	*Mustela vison*

6.3.1.1 NPWS Protected Species Records

National Parks and Wildlife Service (NPWS) online records were searched to see if any rare or protected species of flora or fauna have been recorded from hectad S47. An information request was also sent to the NPWS scientific data unit requesting records from the Rare and Protected Species Database on the 2nd May 2024. A response was received on the 16th May 2024. Table 6-6 lists rare and protected species records obtained from NPWS.

Table 6-6: NPWS records for rare and protected species (Hectad S47)

Common name	Scientific name	Legal Protection/Status
Sand Martin	*Riparia riparia*	Amber (BoCCI)
Skylark	*Alauda arvensis*	Amber (BoCCI)
Swallow	*Hirundo rustica*	Amber (BoCCI)
Kingfisher	*Alcedo atthis*	Amber (BoCCI)
Snipe	*Gallinago gallinago*	Red (BoCCI)
Teal	*Anas crecca*	Amber (BoCCI)
Mute swan	*Cygnus olor*	Amber (BoCCI)
Grey Wagtail	*Motacilla cinerea*	Red (BoCCI)
Little Egret	*Egretta garzetta*	Green (BoCCI)

[12] Named *Fallopia japonica* in the Regs.

Common name	Scientific name	Legal Protection/Status
Spotted Flycatcher	*Muscicapa striata*	Amber (BoCCI)
Common sandpiper	*Actitis hypoleucos*	Amber (BoCCI)
Willow warbler	*Phylloscopus trochilus*	Amber (BoCCI)
House martin	*Delichon urbica*	Amber (BoCCI)
Mallard	*Anas platyrhynchos*	Amber (BoCCI)
Smooth newt	*Lissotron vulgaris*	Wildlife Act
Common Frog	*Rana temporaria*	Wildlife Act, Annex V
White-clawed Crayfish	*Austropotamobius pallipes*	Wildlife Act, Annex II, Annex V
Fallow Deer	*Dama dama*	Wildlife Act
Otter	*Lutra lutra*	Wildlife Act, Annex II, Annex IV
Badger	*Meles meles*	Wildlife Act
Irish Stoat	*Mustela erminea subsp. hibernica*	Wildlife Act
Irish Hare	*Lepus timidus subsp. hibernicus*	Wildlife Act, Annex V
Red Squirrel	*Sciurus vulgaris*	Wildlife Act
Desmoulin's Whorl Snail	*Vertigo moulinsiana*	Annex II
Greater Broomrape	*Orobanche rapum-genistae*	
Green-winged Orchid	*Orchis morio*	VU

FPO = Flora Protection Order; VU = Vulnerable, NT=Near Threatened, WA = Wildlife Act

6.3.1.2 Inland Fisheries Ireland Data

The IFI online database[13] was reviewed for fish species records within the catchments downstream of the Proposed Wind Farm site and the Proposed Grid Connection Route. The Proposed Wind Farm site is within the South-eastern River Basin District and within hydrometric area 15 (Nore). Atlantic Salmon (*Salmo salar*), Brown Trout (*Salmo trutta*), European Eel (*Anguilla anguilla*), Lamprey sp. (*Petromyzontidae*), Minnow (*Phoxinus phoxinus*) and Stone Loach (*Barbatula barbatula*) were recorded in the South Eastern River Basin District in the vicinity of the Proposed Wind Farm and associated Proposed Grid Connection by Inland Fisheries Ireland (IFI) during water sampling for the

[13] *https://opendata-ifigis.hub.arcgis.com/datasets/1034e20d4cce499695a5bd020e594331_0/explore?location=52.730463%2C-7.616216%2C8.84*

Water Framework Directive (WFD) from 2008-2022. Surveys were conducted by IFI in the immediate vicinity of survey sites WF 3, WF 5 and WF 7 in July-October 2021.

6.3.1.3 Freshwater Pearl Mussel (*Margaritifera margaritifera*)

The Proposed Development located within the Nore Upper *Margaritifera* catchment and the Nore Middle *Margaritifera* catchment. The Nore Upper is classified as 'Catchments of SAC Populations listed in S.I. 296 of 2009', while the Nore Middle is classified as 'Catchments of other extant populations'. The Proposed Wind Farm site is hydrologically connected to the Nore Upper *Margaritifera* catchment, via the Durrow townparks watercourse, while the Proposed Wind Farm site is hydrologically connected to the Nore Middle via the Ballyconra stream and the Lisdowney Stream. The proposed Grid Connection is also hydrologically connected to both the Nore Upper and Nore Middle via the River Nore, which runs adjacent and is intersected by the Proposed Grid Route. One record from 2005 was available for freshwater pearl mussel for the River Nore in grid square S47 and was located downstream of the River Nore. Therefore, there is hydrological connection between the Proposed Development and a known freshwater pearl mussel point record. Three other records (from 2005) were available for freshwater pearl mussel for the River Nore in grid square S47, however, they were all located upstream of the development.

6.3.1.4 Regional and Local Hydrology and Hydrogeology

6.3.1.4.1 Regional Hydrology

Proposed Wind Farm

The WFD hierarchy of watercourses and catchment units comprise of river waterbodies (short sections of rivers, typically 1-10km) located in river sub-basins (which are typically 10-50km^2). These sub-basins are located within larger sub-catchments (typically 100-200km^2) denoted with _SC within the nomenclature. The sub-catchments such as the Nore_SC_70 below, contain various sub-basins (such as the Nore_120) and accompanying sections of river waterbodies. The sub-catchments are located within larger catchments (such as the Nore catchment), and these catchments are in turn located within Hydrometric areas.

With respect to regional hydrology, the Proposed Wind Farm site is located within the Nore catchment, within Hydrometric Area 15 (Nore) of the Irish River Basin district. On a more local scale, the Proposed Wind Farm site is contained within the Nore_SC_070 sub-catchment, with a small section to the north of the site located in the Nore_SC_050 sub-catchment. The River Nore is located ~450 meters east of the Proposed Wind Farm site (parallel to N77 road) and flows south through Ballyragget. The majority of the Proposed Wind Farm site drains into the River Nore via the Lisdowney Stream, including its tributaries: Archerstown stream, Aharney stream, and the Ballyconra stream. The Durrow Townparks watercourse drains the northeast of the site to the River Nore just south of Durrow.

The closest major watercourse to the Proposed Wind Farm site is the River Nore situated 450 meters to the east. The river is monitored with measurements by the EPA located at a bridge at E244048, N171562.

The River Erkina is located ~2km north of the site and flows east before discharging into the River Nore approximately ~1.2km north of the Site. The Newtown stream is mapped ~1.8km west of the Proposed Wind Farm site, which flows north before discharging to the River Goul which flows east and discharges to the River Erkina. The Lisdowney stream is mapped directly south of the Site, which flows southeast and discharges into the River Nore approximately ~4km south of the Proposed Wind Farm site. The Loughill river is mapped ~1km east of the site, which flows west and discharges into the River Nore.

A regional hydrology map is shown in Figure 9-1 of Chapter 9 of this EIAR.

Proposed Grid Connection Route

The Proposed Grid Connection undergoing cabling route is located within the catchments of the Nore_120 and Nore_130 waterbodies, i.e. within the Nore_SC_060, Nore_SC_070 and Nore_SC_080 subcatchments. These surface water catchment areas and waterbodies are illustrated in Figure 9-1 of the Chapter 9 Water. The Proposed Grid Connection underground cabling route runs south along the N77 and crosses the River Nore. There is 1 no. watercourse crossing along the Proposed Grid Connection underground cabling route. The co-ordinates of the Proposed Grid Connection underground cabling route crossing are given in Table 6-7 below.

Table 6-7: Watercourse crossings

Townland	River	Easting	Northing
Ballyragget	Nore_130 – River Nore	E243998	N171854

6.3.1.4.2 Local Hydrology

Proposed Wind Farm site

Within the Proposed Wind Farm, there is 1 no. mapped small stream. The Ballyconra stream is mapped by the EPA as beginning in a field ~15m south of the Site boundary and ~480m southeast of turbine T8, however there is also a seepage face leading to a field drain situated ~500m northwest of this point. This seepage face exists along the approximate location of the mapped fault, and the topography and overall nature of the ground near this stream indicates that the seepage face is associated with the transition between the Bregaun flagstone Fm[14]/Kileshin Siltstone Fm and the Carboniferous Limestones of the Clogrenan Fm and Ballyadams Fm. Generally, the flow rate from this seepage face is low, typically 0.25-0.5 l/s.

There is a further unmapped short watercourse north of the Ballyconra stream. This unmapped stream emerges as a small seepage face near E241750, N173608. This seepage then travels along a relatively steep stream channel towards a swallow hole at E241925, N173397, located ~180m north of turbine T6. This stream exists along the mapped fault between the sandstone/shale to the west/northwest and the Limestone to the east, which is further supported with drilling data from MW3 at Turbine T6 (located 140m southwest of swallow hole) and geophysics conducted at the proposed turbine location and across the area of the swallow hole.

The Ballyconra stream is a tributary to the Lisdowney stream.

The Archerstown 15 stream flows south from the northwestern edge of the Wind Farm. The Archerstown 15 stream is not located within the Wind Farm, with the origin point situated ~30m from the site boundary and ~380m southwest of turbine T4. The Archerstown 15 stream flows south where it discharges into the Lisdowney stream.

The topography broadly slopes southeast across the site, although local variations do exist. Any surface water runoff from the Proposed Wind Farm site is expected to flow in this direction (apart from at T4 where the ground slopes southwest).

No field drains were observed across the site, apart from at the origin point of the Ballyconra stream, where it appears the channel has been dug out to encourage drainage from the spring seepage which emerges to the northwest. The agricultural fields are primarily improved grassland, which are well drained.

[14] *Fm – Bedrock Formation; consists of a certain number of bedrock strata that have a comparable lithology, facies or other similar properties.*

A local hydrology map including mapped surface water bodies is shown in Figure 9-2 of Chapter 9 of this EIAR.

Proposed Grid Connection

Drainage along the Proposed Grid Connection underground cabling route is broadly localised to the River Nore which flows along the N77 road. The River Nore meets the N77 National Road approximately ~2.3km north of the Proposed Wind Farm site, and subsequently runs approximately parallel to the N77 road, varying between 0.1-1km east of the road carriageway. Drainage from the road carriageway will primarily drain in the direction of the River Nore, however under typical moderate rainfall conditions, the surface water will likely infiltrate through the soil/subsoil before reaching the river as shallow baseflow, due to the soils (Sand and gravel) and subsoils (High permeability) along the Proposed Grid Connection underground cabling route.

6.3.1.4.3 Water Quality

Biological Q-rating data for EPA monitoring points are available from locations along the River Nore, as well as the River Erkina, River Goul, and the Lisdowney stream. The Q-Rating is a water quality rating system based on both the habitat and the invertebrate community assessment and is divided into status categories ranging from 0-1 (Poor) to 4-5 (Good/High). Q-values are assigned using a combination of habitat characteristics and structure of the macro-invertebrate community within the waterbody. Individual macro-invertebrate families are classified according to their sensitivity to organic pollution and the Q-value is assessed based primarily on their relative abundance within a sample.

The River Nore achieved a Q3-Q4 (Moderate) rating ~ 0.3km to the southeast of the Wind Farm site and a Q4 (Good) rating 0.7~km to the northeast of the Proposed Wind Farm site. These ratings were achieved in 2020 and 2022 respectively.

The River Erkina achieved a Q3 (Poor) status based on sampling from 2022. The River Goul also achieved a Q3 (Poor) rating from sampling completed in 2022. The Lisdowney stream achieved a Q3-Q4 (Moderate) rating from sampling completed in 2022.

A summary of the Q ratings is given below in Table 6-8.

Table 6-8: Water quality status of watercourses within or in proximity of the Proposed Wind Farm site

Waterbody	Substation Code	Year	Q rating	Status
R. Nore	RS15N011380	2020	3-4	Moderate
R. Nore	RS15N011300	2022	4	Good
R. Erkina	RS15E010300	2022	3	Poor
R. Goul	RS15G020500	2022	3	Poor
Lisdowney stream	RS15L020100	2022	3-4	Moderate

6.3.1.5 Conclusions of the Desktop Study

The desktop study has provided information about the existing environment in hectad S4 within which the Proposed Development is located. The majority of the Proposed Wind Farm site is located in the Nore catchment and the Nore_SC_070 and Nore_SC_050 sub-catchments.

Watercourses that drain the Proposed Wind Farm site, ultimately discharge to the River Barrow and River Nore SAC and Rive Nore SPA, while the Proposed Grid Connection Route runs adjacent to

both European Designated sites and crosses them at one point (see Table 6-7 above). As such, both European sites are within the ZoI of the Proposed Development. One Nationally Designated site is also within the ZoI of the Proposed Development, namely:

- River Nore / Abbeyleix Woods Complex pNHA

The desk study identified that a variety of protected faunal species are known to occur within the wider study area, including bats, otter, badger, pine marten etc. The mammal species recorded during the desk study informed the survey methodologies undertaken during the site visits. The mammal species recorded within the relevant hectad have widespread range and distributions in Ireland and are likely to be recorded frequently throughout Ireland (Marnell et al, 2009). The Proposed Wind Farm aquatic survey locations WF 6 and WF 7 and Proposed Grid Connection survey location GC1 is located within the Nore Upper *Margaritifera* sensitive area, which is listed as catchment of SAC populations of Freshwater Pearl Mussel listed in S.I. 296 of 2009.

The remaining survey sites are located within the Nore Middle catchment, listed as a catchment of other extant populations of Freshwater Pearl Mussel outside of SAC populations.

The desk study revealed that there are no known Annex I Article 17 habitats present within or in close proximity to the Proposed Wind Farm, similarly no known records of rare or protected flora have been recorded within the site.

The desk study provided useful information to inform the ecological surveys undertaken on site as well as the identification of pathways for potential impact on sensitive ecological receptors.

6.4 Baseline Ecological Survey Results

6.4.1 Habitats within the Proposed Wind Farm site

Detailed botanical data from relevés recorded at turbine base locations across the Proposed Wind Farm site are provided in Appendix 6-1 of this EIAR. A habitat map of the Proposed Wind Farm site is provided in Figure 6-3 and 6-4. A map showing the development footprint overlaying the Habitat Map is shown in Figure 6-5 and 6-6.

A total of fourteen habitats were recorded within the Proposed Wind Farm site including:

- Improved Agricultural Grassland (GA1)
- Wet Grassland (GS4)
- Arable Crops (BC1)
- Tilled Land (BC3)
- (Mixed) Broadleaved Woodland (WD1)
- (Mixed) Broadleaved / Conifer Woodland (WD2)
- Wet Willow-Alder-Ash Woodland (WN6)
- Scrub (WS1)
- Earth Banks (BL2) associated with hedgerows (WL1) and treelines (WL2)
- Hedgerows (WL1)
- Treelines (WL2)
- Drainage Ditches (FW4)
- Eroding/ Upland River (FW1)
- Buildings and Artificial Surfaces (BL3)

6.4.1.1 Improved Agricultural Grassland (GA1)

The majority of the lands within the Proposed Wind Farm site were characterised as Improved Agricultural Grassland (GA1) pasture (See Plate 6.1). The sward within GA1 fields was dominated by perennial ryegrass (*Lolium perenne*) and Yorkshire fog (*Holcus lanatus*) with creeping buttercup (*Ranunculus repens*) abundant in many fields, while species such as annual meadow grass (*Poa annua*), red clover (*Trifolium pratense*) and white clover (*Trifolium repens*) were recorded frequently. Common bent grass (*Agrostis capillaris*), sweet vernal grass (*Anthoxanthum odoratum*), common daisy (*Bellis perennis*), meadow buttercup (*Ranunculus acris*), creeping thistle (*Cirsium arvense*), common dandelion (*Taraxacum officinale*), common sorrel (*Rumex acetosa*), curly dock (*Rumex crispus*), common chickweed (*Stellaria media*) and common mouse-ear chickweed (*Cerastium fontanum*) were recorded occasionally throughout this habitat. Rarely recorded species included meadow foxtail (*Alopecurus pratensis*), Fat-hen (*Chenopodium album*), common wheat (*Triticum aestivum*), springy turf moss (*Rhytidiadelphus squarrosus)* and cuckoo flower (*Cardamine pratensis*). These areas of grassland were under intense agricultural management and grazed by livestock.

Plate 6-1. An example of improved agricultural grassland (GA1) in the vicinity of the proposed location for Turbine 2, in the northwest section of the Proposed Wind Farm site.

6.4.1.2 Wet Grassland (GS4)

Wet Grassland (GS4) was recorded within agricultural fields throughout the Proposed Wind Farm site, with the greatest concentration of this habitat located in the vicinity of Turbine 4 in the centre of the site. This habitat type (see Plate 6-2) within the Proposed Wind Farm site was dominated by grasses such as common bent and yorkshire fog and rushes, such as soft rush (*Juncus effusus*) and hard rush (*Juncus inflexus*) which were recorded in abundance. Other species recorded within this habitat included perennial ryegrass, meadow buttercup, curly dock, broadleaved dock, meadow foxtail grass, white clover, cuckoo flower and common daisy. A small area of wet grassland habitat adjacent to Turbine 4 supported a small number of devil's bit scabious (*Succisa pratensis*) plants. This area had been heavily poached by cattle at the time of survey. Devil's-bit scabious is a positive indicator species for the Annex I habitat type Molinia meadows [6410]. However, as this was the only positive indicator species for this Annex I habitat type recorded, it can be concluded that the Wet Grassland (GS4) habitat recorded within the Proposed Wind Farm site does not align with the Annex I habitat type *Molinia* meadows [6410].

Plate 6-2: Wet grassland (GS4) recorded in the vicinity of the proposed location for Turbine 4.

6.4.1.3 Scrub (WS1)

Scrub (WS1) habitat was only recorded in a small number of areas within the Proposed Wind Farm site and was predominantly associated with areas of mixed broadleaved woodland or where scrub species from hedgerows began to encroach into fields. Where scrub habitat had started to develop it was dominated by willow (*Salix spp.*), gorse (*Ulex europaeus*) and bramble (*Rubus fruticosu*) (see Plate 6-3).

Plate 6-3. An area of scrub habitat (WS1) adjacent to Turbine 6.

6.4.1.4 Hedgerow (WL1)

Hedgerows (WL1) were recorded throughout the Proposed Wind Farm site,the majority forming field boundaries within the site. The majority of the hedgerows were intact and well-managed and were often associated with dry drainage ditches (see Plate 6-4). However, in parts of the site, hedgerows were outgrown and top heavy. Some hedgerows across the Proposed Development site demarcated townland boundaries, and were therefore, of historical significance (See Plate 6-5). These hedgerows had a richer and more diverse floristic composition than other hedgerows across the site. The majority of the hedgerows were dominated by hawthorn (*Crataegus monogyna*), with blackthorn (*Prunus spinosa*), ivy (*Hedera helix*), elder (*Sambucus nigra*), and honeysuckle (*Lonicera periclymenum*). Other hedgerow species also recorded included hazel (*Corylus avellana*), holly (*Ilex aquifolium*), wild rose, and spindle (*Euonymus europaeus*). Individual trees such as beech (*Fagus sylvatica*), ash (*Fraxinus excelsior*), pedunculate oak (*Quercus robur*), goat willow (*Salix caprea*), alder (*Alnus glutinosa*), and aspen (*Populus tremula*) were growing as individual trees within hedgerows.

Some of the hedgerows across the site had well developed understories and a diverse ground flora associated with them with species such as lords and ladies (*Arum maculatum*), cow parsley (*Anthriscus sylvestris),* bluebells (*Hyacinthoides non-scripta*), greater stitchwort (*Stellaria holostea*), primrose (*Primula vulgaris*), golden saxifrage (*Chrysosplenium oppositifolium*), common dog violet (*Viola riviniana*), wood avens (*Geum urbanum*), and lesser celandine (*Ficaria verna*) recorded.

Following the initial site survey, dedicated hedgerow appraisals were carried out as set out in Section 6.2.3.3 above. The results of the hedgerow appraisals are outlined in Section 6.4.3 below and are further detailed in Appendix 6-1, the Botanical Report.

Plate 6-4: Heavily managed Hedgerow (WL1) within the boundaries of the Proposed Wind Farm.

Plate 6-5: Outgrown Hedgerow (WL1) of high significance within the boundaries of the Proposed Wind Farm.

6.4.1.5 Treeline (WL2)

Where linear 'hedgerow' features were over 5m in height and were made up of semi-mature to mature trees, these were characterised as treelines (WL2), with ash(*Fraxinus excelsior),* oak (*Quercus* sp.), beech, and sycamore *(Acer pseudoplatanus)* species making up the majority of the treelines on the Proposed Wind Farm site. Occasional treelines of broadleaved species were also recorded comprising of ash sycamore and silver birch *(Betula pendula)* (Plate 6-6).

Plate 6-6: Mature treeline (WL2) forming a field boundary within the Proposed Wind Farm site.

6.4.1.6 Earth Banks (BL2)

Earh banks (BL2), where present, were generally associated with hedgerows (Wl1) or treelines (WL2). These banks were generally composed of clay and were often bordered by drainage ditches. Most were completely vegetated and usually supported abundant grasses or species such as foxglove (*Digitalis purpurea)*, ferns and ivy. However, some earth banks were bare and species such as the ashy mining bee (*Andrena cineraria*) were recorded nesting within the banks (see Section 6.4.7.6).

6.4.1.7 Drainage Ditches (FW4)

A number of drainage ditches were recorded across the Proposed Wind Farm site. These drains were mostly associated with field boundaries such as hedgerows and treelines and were approximately 0-100cm wide. They varied in vegetation composition. The majority of the drains on site were dry. Species such as nettles (*Urtica dioica*), brambles, and docks (*Rumex* spp.) were recorded in dry drains. Aquatic species such as watercress (*Nasturtium officinale*) were recorded in drains that appeared to be predominantly wet most of the year (see Plate 6.7).

Plate 6-7: Drainage ditch (FW4) dominated by watercress recorded within the boundaries of the Proposed Wind Farm.

6.4.1.8 Buildings and Artificial Surfaces (BL3)

Existing farm tracks within the Proposed Wind Farm site were categorised as Buildings and Artificial Surfaces (BL3). Any private dwellings, agricultural buildings and/or old ruins within the site were also categorised as BL3 (see Plate 6.8)

Plate 6-8: Ruins of an old stone building (BL3) recorded within an area of scrub.

6.4.1.9 Arable Crops (BC1)

A number of agricultural fields within the northern section of the Proposed Wind Farm site were characterised as Arable crops (BC1) (see Plate 6-9). These fields were cultivated and managed for the production of arable crops, including cereals such as wheat, barley and oats. Species such as common poppy (*Papaver rhoeas*) and wild carrot (*Daucus carota*) were recorded along the verges of these fields.

Plate 6-9: Arable crops (BC1) field recorded within the footprint of Turbine 3.

6.4.1.10 Tilled Land (BC3)

An area of Tilled Land (BC3) was recorded in the northern section of the Proposed Wind Farm site (see Plate 6-10). This field had been recently tilled in preparation for planting and was therefore devoid of vegetation.

Plate 6-10: Tilled land (BC3) recorded in the vicinity of Turbine 3.

6.4.1.11 (Mixed) Broadleaved Woodland (WD1)

Several areas of (Mixed) Broadleaved Woodland (WD1) were recorded across the Proposed Wind Farm site and immediately adjacent to the Proposed Wind Farm boundary (see Plate 6-11). These areas were dominated by species such as oak, ash, and sycamore. Understory species recorded within areas included hawthorn, gorse, hazel, elder, holly and willow. Honeysuckle (*Lonicera periclymenum*), bracken (*Pteridium aquilinum)*, fern spp., bluebells, and ivy were recorded within the ground flora.

Plate 6-11: (Mixed) broadleaved woodland (WD1) recorded east of Turbine 1 outside the boundaries of the Proposed Wind Farm.

6.4.1.12 (Mixed) Broadleaved/ Conifer Woodland (WD2)

One small area of (Mixed) Broadleaved / Conifer Woodland (WD2) was recorded within the Proposed Wind Farm site. This area was located north-east of Turbine 6 and was dominated by ash and *Pinus* spp. Understory species recorded within this area included hawthorn, elder, and ivy. Abundant Lady's fern (*Athyrium filix-femina*), lesser celandine, cow parsley, hart's tongue fern (*Asplenium scolopendrium*), and bluebells were recorded in the ground flora (See Plate 6-12). An earth bank (BL2) with a stone wall beneath it ran through this area of woodland. A swallow hole feature was recorded within this area of woodland (further detailed in Section 6.4.5 below).

Plate 6-12: (Mixed) broadleaved / conifer woodland (WD2) recorded north-east of Turbine 6.

6.4.1.13 Wet Willow-Alder-Ash Woodland (WN6)

An area of Wet Willow-Alder- Ash woodland (WN6), dominated by willow and ash species was recorded north-west of Turbine 8 (See Plate 6-13). The ground flora was dominated by bramble and nettles, however, other species recorded included enchanters nightshade (*Circaea lutetiana*), meadowsweet (*Filipendula ulmaria*), herb robert (*Geranium robertianum*), lesser celandine, creeping buttercup, ivy, cleavers (*Galium aparine*), Lords-and-Ladies, water cress, ground ivy, woundwort (*Stachys sylvatica*), feather moss (*Pleurozium schreberi*), royal fern (*Osmunda regalis*), *Carex* spp., and Juniper haircap (*Polytrichum junipercarum).* While some positive indicator species for the Annex I habitat type Alluvial Woodland [91E0] were recorded (namely ash, willow, nettle, meadowsweet, creeping buttercup and *Carex* spp.) this area of Wet Willow-Alder-Ash woodland (WN6) does not align with this Annex I habitat type due to the dominance of scrubby ruderal species, primarily bramble.

Plate 6-13: Area of Wet willow-alder-ash woodland (WN6) recorded north-west of Turbine 8.

6.4.1.14 Eroding Upland Rivers/Streams (FW1)

A section of the Durrow Townparks (Nore_110) was recorded within the north of the Proposed Development site. This was categorised as an Eroding/ upland river (FW1). This watercourse flowed in a north-easterly direction and flowed into the River Nore (See Plate 6-14). At the time of the aquatics survey the section of river within the site was noted to be largely unwetted at the time of survey, with isolated sections of shallowly wetted, undefined channel. Channel substrate was largely clay, earth and silt, with infrequent, largely unwetted stone-based substrata at the upstream extent. Any wetted sections of channel were 0.01–0.05m in depth and heavily silted and turbid even when undisturbed, with a brown water colouration.

Plate 6-14: Durrow townparks classified as an Eroding / upland river (FW1).

6.4.2 Habitats along the Proposed Grid Connection Route

The underground cabling required to facilitate the Proposed Grid Connection Route will be laid beneath the surface of the internal site road network and public road. It is proposed that the Proposed Grid Connection Route will originate at the onsite 38kV substation, which is located within an area of Improved Agricultural Grassland (GA1) in the eastern vicinity of the Proposed Wind Farm site. The cable will run east towards the national road, N77 (Buildings and artificial surfaces (BL3)) and will continue south towards Ballyragget, Co. Kilkenny for 2.2km. The cable will run along the road verge to the point of the launch pit where the cable will travel under the River Nore by Horizontal Directional Drilling (HDD) and arrive at the reception pit within Improved Agricultural Grassland (GA1). From here, the cable will cut through a Hedgerow (WL1) and Improved Agricultural Grassland (GA1) to reach the Ballyragget 110kV substation (see Plates 6-15 and 6-16).

The River Nore which runs in a southerly direction to the east of the Proposed Wind farm was classified as a Depositing / Lowland River (FW2) and was characterised by slow moving, deep glides (See Plate 6-17). While sections of the river surveyed for the Proposed Grid Connection crossing displayed a generally straight channel profile, the River Nore displayed a meandering profile throughout the wider landscape. The channel substrate was predominantly compacted cobble, with a patchy distribution of filamentous green algae growth and moderate siltation atop channel bed substrata. Vegetated earthen banks, dominated by cock's foot, Yorkshire Fog and *Poa spp.*, as well as nettle, creeping buttercup, meadow buttercup, and cuckoo flower extended into adjacent Improved Agricultural Grassland (GA1). Earthen banks were eroded and undercut in places, and in combination

with overhanging vegetation, provided marginal refugia. Water was very clear when undisturbed, with plumes of silt evident when channel substrate was disturbed underfoot, particularly along marginal silt beds (See Plate 6-18). The channel was largely unshaded, with the exception of marginal and emergent stands of reed canary grass (*Phalaris arundinacea*), great willowherb (*Epilobium hirsutum*) and branched bur-reed (*Sparganium erectum*) which provided instream refugia. Overhanging willow branches provided further shading to the channel margins.

Plate 6-15: Improved Agricultural Grassland (GA1) and hedgerow (WL1) through which the Proposed Grid Connection will travel. Photo looking north towards Ballyragget substation.

Plate 6-16: Hedgerow through which the Proposed Grid Connection will travel.

Plate 6-17: The River Nore which was classified as a Depositing / lowland river (FW2).

Plate 6-18: Well vegetated banks either side of the River Nore.

6.4.2.1 Watercourse Crossings

There will be two watercourse crossings as part of the Proposed Development. The first watercourse crossing is within the Proposed Wind Farm site, located north of T8. This drain crossing will involve the construction of a clear span crossing. The second watercourse crossing will involve the crossing of the River Nore for the Proposed Grid Connection. This will require Horizontal Directional Drilling (HDD).

No instream works are required for any watercourse crossings associated with the Proposed Development.

Table 6-9 Bridge/Watercourse crossing infrastructure

Crossing	Works Proposed	Photo
Drainage Ditch (Proposed Windfarm Site)	Clear-span bridge crossing	
River Nore (Grid Route)	HDD (no instream works).	

6.4.2.2 Habitats – Turbine Delivery Route

Accommodation Area

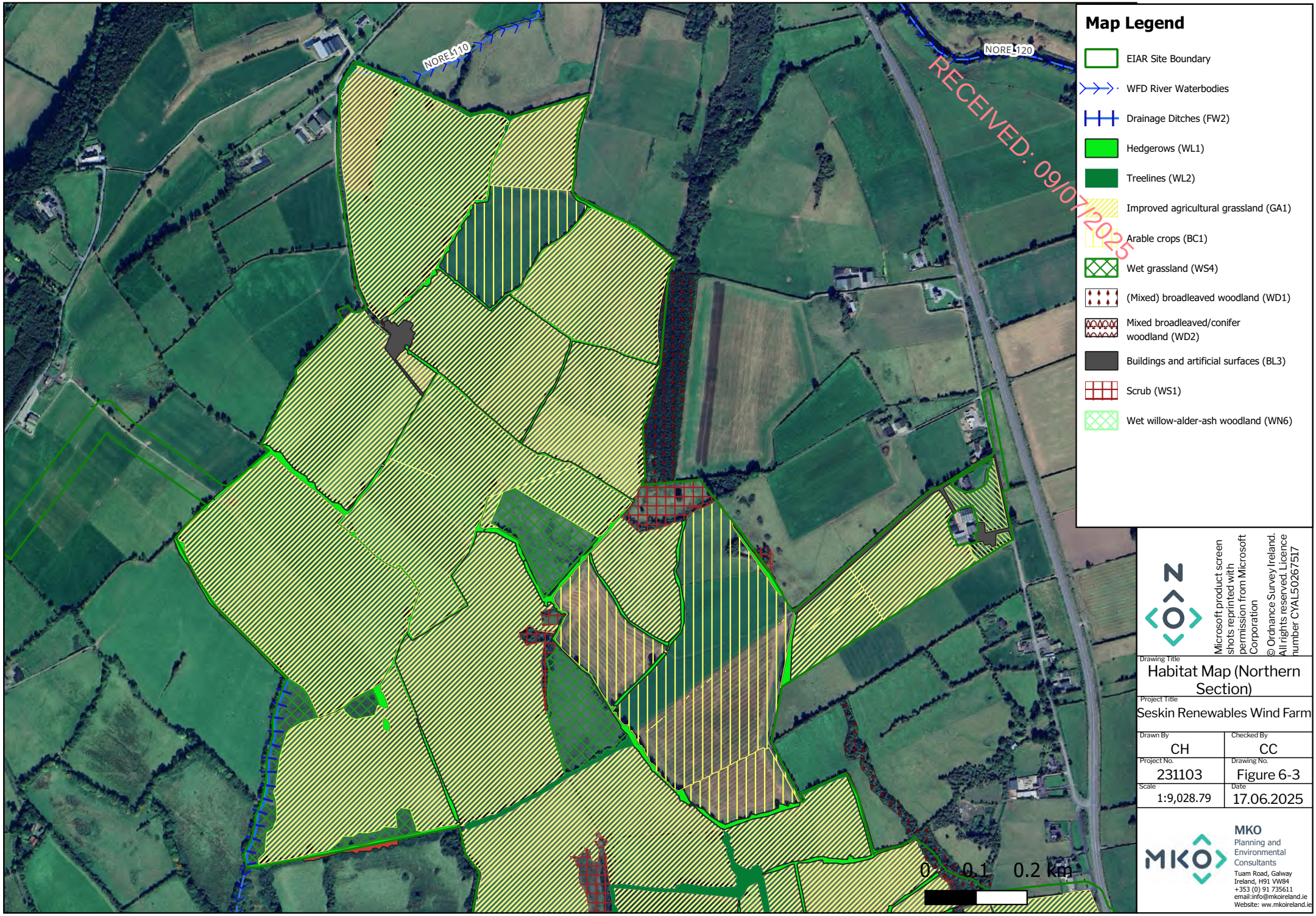
Road and junction widening are sometimes required along proposed turbine delivery routes (TDR) to accommodate the large vehicles used to transport turbine components to site. The proposed transport route for the Proposed Development has been the subject of a route assessment to determine if any works are required along its length. Full details of the assessment are included as part of the traffic impact assessment (Chapter 15) and also detailed in Chapter 4. There are sections on the route where the vertical alignment may require specialist transport vehicles. These sections will be further considered by the appointed transport company following turbine procurement process.

Accommodation areas will be required at two locations on the N77 National Secondary Road between Durrow, Co. Laois, and the main Proposed Development site entrance in the townland of Ballynaslee, Co. Kilkenny. These accommodation areas will be temporary in nature and only used for the purposes of abnormal load delivery. The locations of the accommodation areas are shown in Figures 4-23 to 4-24 of Chapter 4.

It has been identified that accommodation works at Location 1 (see Figure 4-23, Chapter 4) will require the removal of a small number of semi-mature trees, ornamental furniture signage and electricity/telecommunication poles, within and around the green space categorized as Improved amenity grassland (GA2), see Plate 6-19 below.

It has been identified that accommodation works at Location 2 will involve the temporary covering of the grass area categorised as Improved amenity grassland (GA2) with crushed stone. Upon the completion of the construction phase, the accommodation area will be covered with a layer of topsoil and reseeded.

Plate 6-19: Photo showing receiving habitat at along turbine delivery route (TDR) (Accommodation Area 1).



Drawing Title
Habitat Map (Northern Section)

Project Title
Seskin Renewables Wind Farm

Drawn By	Checked By
CH	CC
Project No.	Drawing No.
231103	Figure 6-3
Scale	Date
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Map Legend

- EIAR Site Boundary
- WFD River Waterbodies
- Drainage Ditches (FW2)
- Hedgerows (WL1)
- Treelines (WL2)
- Improved agricultural grassland (GA1)
- Arable crops (BC1)
- Wet grassland (WS4)
- (Mixed) broadleaved woodland (WD1)
- Mixed broadleaved/conifer woodland (WD2)
- Buildings and artificial surfaces (BL3)
- Scrub (WS1)
- Wet willow-alder-ash woodland (WN6)

Drawing Title
Habitat Map (Southern Section)

Project Title
Seskin Renewables Wind Farm

Drawn By	Checked By
CH	CC
Project No.	Drawing No.
231103	Figure 6-4
Scale	Date
1:10,270.6	17.06.2025

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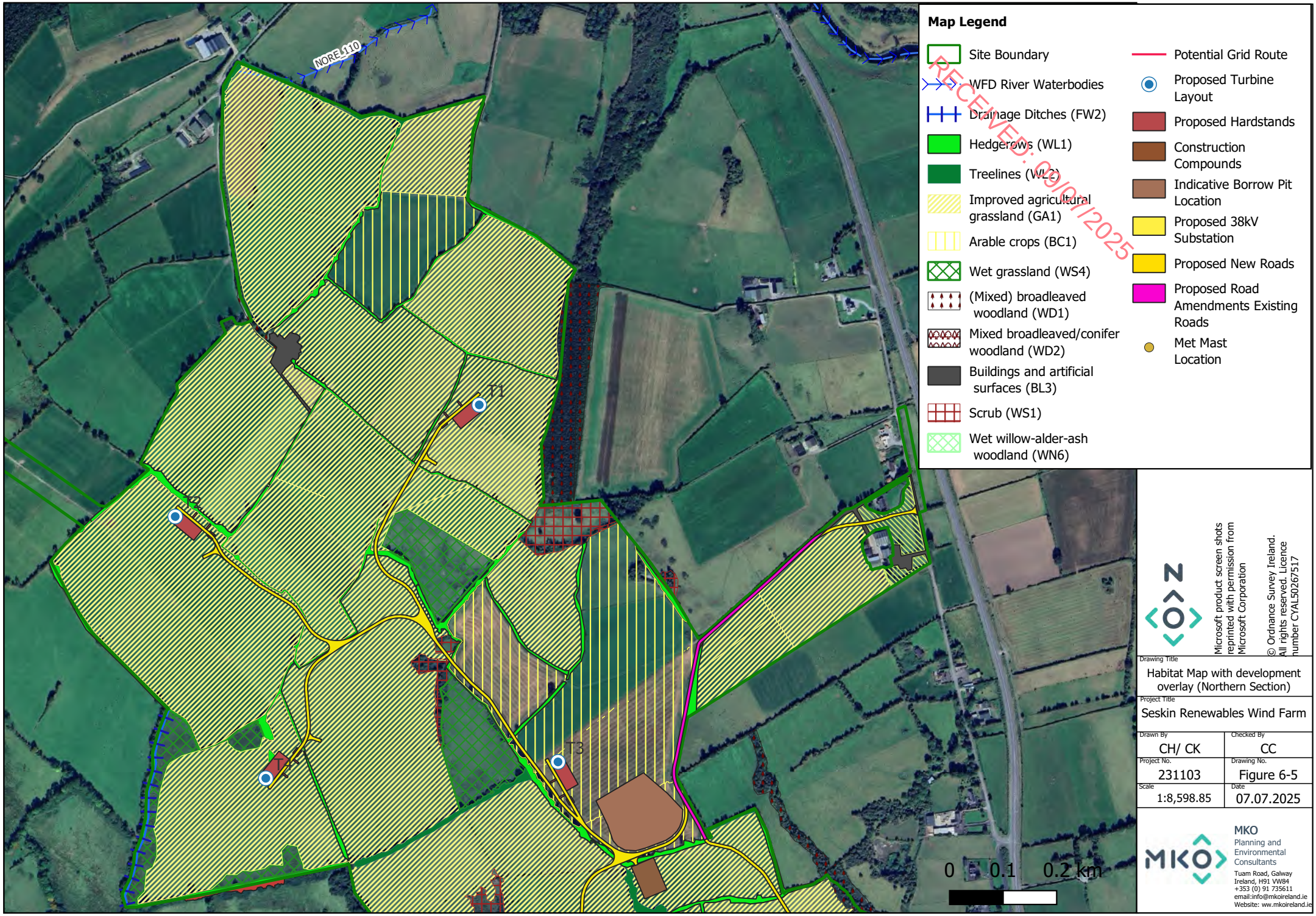
NORE 110
T1
T2
T3
T4
RECEIVED: 09/07/2025
Map Legend
Site Boundary
WFD River Waterbodies
Drainage Ditches (FW2)
Hedgerows (WL1)
Treelines (WL2)
Improved agricultural grassland (GA1)
Arable crops (BC1)
Wet grassland (WS4)
(Mixed) broadleaved woodland (WD1)
Mixed broadleaved/conifer woodland (WD2)
Buildings and artificial surfaces (BL3)
Scrub (WS1)
Wet willow-alder-ash woodland (WN6)
Potential Grid Route
Proposed Turbine Layout
Proposed Hardstands
Construction Compounds
Indicative Borrow Pit Location
Proposed 38kV Substation
Proposed New Roads
Proposed Road Amendments Existing Roads
Met Mast Location
0 0.1 0.2 km
Microsoft product screen shots reprinted with permission from Microsoft Corporation
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Drawing Title
Habitat Map with development overlay (Northern Section)
Project Title
Seskin Renewables Wind Farm
Drawn By
CH/ CK
Checked By
CC
Project No.
231103
Drawing No.
Figure 6-5
Scale
1:8,598.85
Date
07.07.2025
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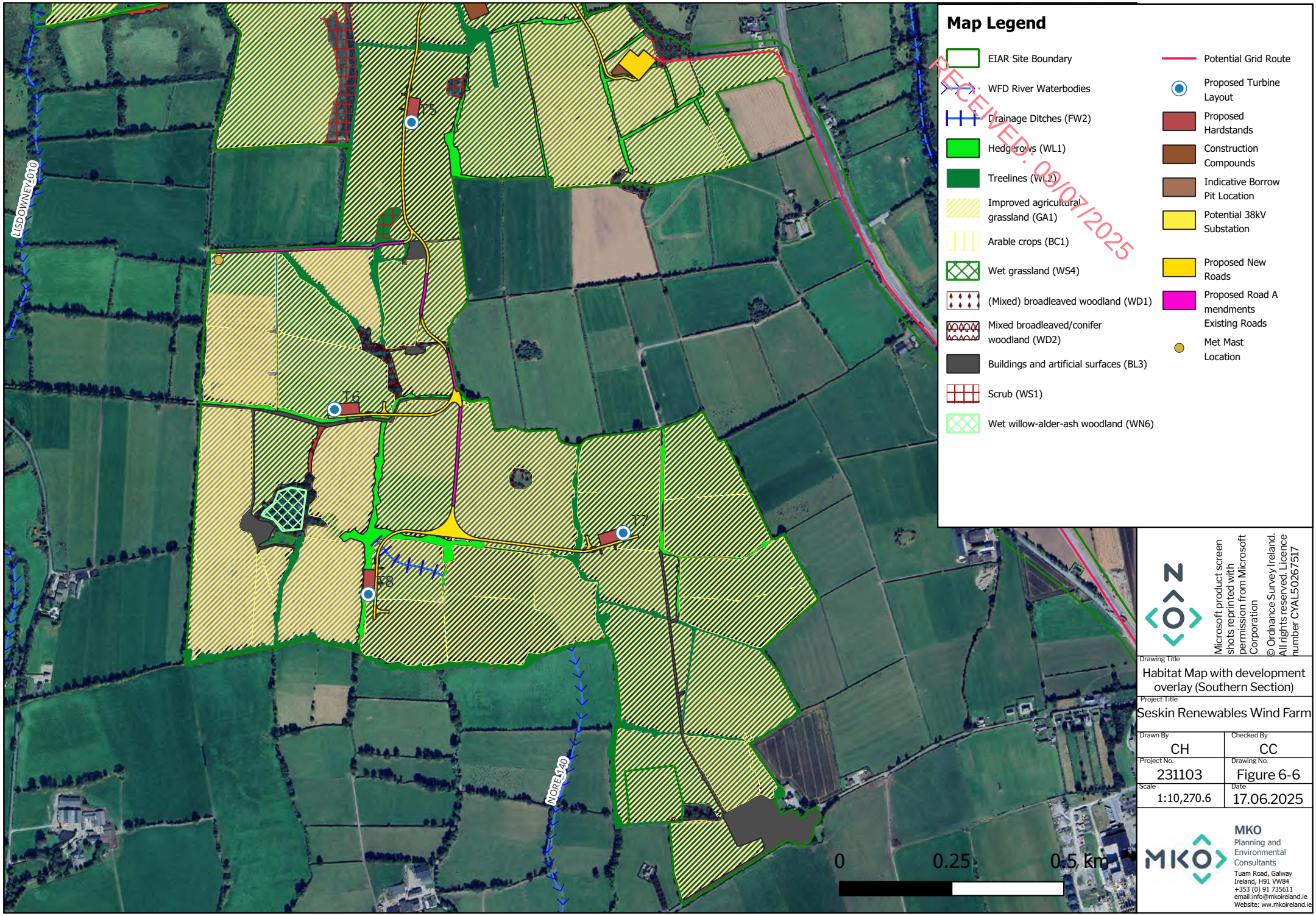

Drawing Title
Habitat Map with development overlay (Southern Section)

Project Title
Seskin Renewables Wind Farm

Drawn By	Checked By
CH	CC
Project No.	Drawing No.
231103	Figure 6-6
Scale	Date
1:10,270.6	17.06.2025

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6.4.3 Hedgerow Appraisal

Detailed hedgerow survey findings are included within the Botanical Report in Appendix 6-1 and summarised in Table 6-10 and 6-11 below. Tables should be read in conjunction with Figures 6-7 and 6-8 below. In summary, a number of the hedgerows across the site were considered to be of high to moderate significance based on the diversity of woody species and ground flora species they supported. Where a number of the hedgerows within the site were found to follow old townland/county boundaries[15], such hedgerows are given a high significance rating in line with the HAS. Townland boundary hedgerows tend to be older than other hedgerows and may therefore be richer in species (e.g. Foulkes and Murray, 2005).

Figures 6-7 and 6-8 show hedgerows to be lost to the Proposed Development infrastructure including required bat felling buffers as outlined in Section 6.1.3 of the Bat Report (see Appendix 6-2).

Table 6-10 HAS survey results (Hedgerows 1-4)

Hedgerow ID:	1A	1B	1C	2A	2B	3A	3B	3C	3D	4A	4B	4C
Hedgerow (woody) Species Diversity*:	2	1	2	4	2	3	2	2	1	4	2	2
Ground Flora Species Diversity:	4	2	3	4	4	4	4	0	4	4	4	4
Hedgerow follows Townland Boundary	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No

Species Diversity Significance is calculated as the highest significance value for hedgerow / ground flora species for any 30 m sample along the hedgerow. Hedgerow Significance: **0 - **Low Significance**; **1** - **Slightly Significant**; **2** - **Moderately Significant**; **3** – **Significant**; **4** - **Highly Significant** - Adapted from HAS guidelines (Foulkes et al., 2013).*

Table 6-11 HAS survey results (Hedgerows 5-8)

Hedgerow ID:	5A	5B	5C	5D	5F	5G	5H	5I	6A	6B	6C	7A	8A
Hedgerow (woody) Species Diversity*:	2	1	1	1	1	0	1	1	1	4	2	2	3
Ground Flora Species Diversity:	4	3	1	0	1	0	1	0	4	4	4	4	4
Hedgerow follows Townland Boundary	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No

[15] *1st Edition Ordnance Survey map (1841)*

641000

642000

675000

674000

N

1A

T1

1B

2A

T2

2B

1C

Out

Out

3A

3C

4B

4C

4A

T4

T3

3B

3D/5A

Out

5F

5B

5H

5G

5I

T5

5C

5D

0

250

500 m

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Map Legend

- Proposed Turbines
- Infrastructure With Bat Buffer
- EIAR Site Boundary
- Townland Boundary

Hedgerow Significance

- High Significant
- Moderate Significant

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

N

SITE LOCATION - NOT TO SCALE

Drawing Title
Map of Hedgerows Surveyed within North of Site

Project Title
AIP Seskin Wind Farm

Project No.	Drawing No.	Scale
231103	Figure 6-7	1:5,500
Drawn By	Checked By	Date
BOC	CK	08/07/2025

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642000
643000
674000
673000
N
5B/5A
5F
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5H
5G
5I
T5
5C
5D
6A
Out
T6
6B
6C
T7
7A
Out
8A
T8
0
250
500 m
RECEIVED: 09/07/2025

Map Legend

- Proposed Turbines
- Infrastructure With Bat Buffer
- EIAR Site Boundary
- Townland Boundary

Hedgerow Significance

- High Significant
- Moderate Significant

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

SITE LOCATION - NOT TO SCALE

Drawing Title
Map of Hedgerows Surveyed within South of Site

Project Title
AIP Seskin Wind Farm

Project No.	Drawing No.	Scale
231103	Figure 6-8	1:5,500
Drawn By	Checked By	Date
BOC	CK	08/07/2025

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6.4.4 Protected Habitats/Flora

In summary, as described in the preceding sections, no Annex I habitats were recorded within the Proposed Development site. Furthermore, no botanical species listed under the Flora (protection) Order or listed in the Irish Red Data Books were recorded on the site. No rare and protected plant species recorded in the desk study, including those obtained from NPWS data request were recorded within the study area.

6.4.5 Karst Feature

Detailed findings regarding the karst feature, classified as a swallow hole by HES are included in Section 9.3.6.4 of the Hydrology Chapter (Chapter 9). This swallow hole is located northeast of T6. Surveys undertaken by HES confirmed that no tufa was present at this location, ruling out the potential for the Annex I Habitat, Petrifying Spring with Tufa formation to be present. Concurrently the ecology team conducted botanical surveys in this area confirming just one positive indicator species usually associated with this Annex I habitat type, namely opposite-leaved saxifrage (*Chrysosplenium oppositifolium*). However, the presence/absence of tufa is a determining factor for this to be considered the priority Annex I habitat, Petrifying Spring with Tufa Formation, and as no tufa was recorded at this location it could be concluded that this Annex I habitat type is not present within the Proposed Development site.

6.4.6 Invasive species

No invasive species listed on the Third Schedule were recorded within the Proposed Wind Farm site or along the Proposed Grid Connection Route.

6.4.7 Fauna in the Existing Environment

The following subsections provide the results of the faunal surveys undertaken within the Proposed Wind Farm site and along the Proposed Grid Connection during the site visits and assessments as outlined in Section 6.2.3 (Field Surveys). Evidence of fauna recorded within the site is depicted in Figure 6-9 and 6-10.

6.4.7.1 Badger

Multiple signs of badger activity were recorded within the Proposed Wind Farm site comprising setts (active and inactive), latrines and snuffle holes (See Figure 6-9, Figure 6-10 and Figure 6-11). Camera traps were deployed at five locations across the site. The results of the data recorded determined that there is one main active badger sett within the site (see Plate 6-20). Two additional setts constituting outlier setts were confirmed within the site. No badger were confirmed using these outlier setts. Due to ongoing persecution of badger in Ireland the locations of the setts within the site are not published within the report. There will be no direct impact on any setts across the site. The main badger sett is located over 136m from the nearest infrastructure, while the outlier setts are located over 100m from the nearest infrastructure. A potential badger sett was also recorded approximately 131m from the grid connection infrastructure.

Plate 6-20: Badger recorded emerging from main sett within the Proposed Development site (Note: An error with camera set up resulted in date showing up incorrectly cameras were deployed in 2024).

6.4.7.2 Pine Marten

Pine marten was documented on several occasions from footage obtained by the camera traps deployed across the Proposed Wind Farm site (see Plate 6-21). The footage showed pine marten were active within the vicinity of Turbine 1 and Turbine 6, however no den was recorded by surveyors.

Plate 6-21: Pine marten recorded on camera footage south-west of Turbine 1.

6.4.7.3 Otter

All watercourses (including drainage ditches) within the Proposed Wind Farm site and along the Proposed Grid Connection route were surveyed for signs of otter. No signs of were recorded within the boundaries of the Proposed Wind Farm site. During aquatic surveys, otter spraint and prints were recorded at two of the aquatic survey locations in the wider locality namely WF 2 and WF 5 (see Appendix 6.3 for further detail). Signs of otter were recorded along the Proposed Grid Connection route where it runs adjacent to, and crosses, the River Nore (See Figure 6-11). Multiple signs of otter

were recorded in the form of prints (See Plate 6-22), spraints and feeding remains (See Plate 6-23). A potential otter holt was recorded along the bank of the River Nore. Following the deployment of a trail camera from 19th December 2024 to 17th January 2025, the holt was confirmed to be active (See Plate 6-24). The holt was in regular use by a single individual during the time of camera deployment. Based on the footage captured it is not considered to be a breeding holt.

Plate 6-2210: Otter print recorded within the vicinity of the Proposed Grid Connection crossing point during the multidisciplinary walkover survey.

Plate 6-23: Otter spraint (left photo) and salmon head (feeding remains) recorded downstream of the Proposed Grid Connection crossing point.

Plate 6-24: Otter recorded by trail camera approximately 165m upstream of Proposed Grid Connection crossing point.

6.4.7.4 Bats

Full details of results of bat surveys undertaken in 2023 and 2024 are provided in the Bat Report (Appendix 6-2) and are summarised in this section. All survey and detector locations are shown in Figures 3-1, 3-2, 4-1 to 4-5 in the Bat Report.

Bat surveys were undertaken within the Proposed Wind Farm site in Spring, Summer and Autumn of 2023 and 2024. Eight static detectors were deployed at or near the Proposed Wind Farm turbine locations during each season in 2023. In complement, a bat habitat appraisal and manual activity surveys were conducted.

The static surveys revealed that the site was mainly used by common pipistrelle (n=106,096). Soprano pipistrelle bat passes (n=63,201) were the second highest bat species recorded on site followed by Leisler's bat (n=10,416) and *Myotis* spp. (n=2,429). Brown long-eared bat (n=555) and Nathusius' pipistrelle (n=444) were present in lower numbers. The bats species used the site consistently over the deployments.

The Median Bat Pass Rate per detector, per survey period demonstrates seasonal and spatial variation in bat activity. In spring, activity was highest at D02, with notable levels also at D04 and D08, while the remaining detectors recorded low activity. Summer showed the highest overall bat activity, led by D03, followed by D02, D06 and D07; in contrast, D01, D04, and D05 recorded minimal activity. In autumn, D03 remained the most active site, with relatively moderate activity at D06 and D07, and reduced levels elsewhere.

Manual transect surveys were carried out during each season, across the Proposed Wind Farm site. The species composition recorded throughout the transects was similar to the static results, with common pipistrelle dominating activity levels, followed by soprano pipistrelle, *Myotis spp.* and Leisler's bat. Bat activity was concentrated along treelines, hedgerows, and linear (road/track) habitats.

During the bat habitat appraisal, three structures containing potential suitable bat roost features were identified within the Site, with several additional structures recorded outside the site boundary. The structures were subject to interior (where accessible) and exterior inspections to search for evidence of bats. They were assessed as having a Low to Moderate suitability for roosting bats. The structures were subject to emergence surveys, as detailed in the bat report. Two structures, a derelict farmhouse shed and inhabited farmhouse, were identified as small common and soprano pipistrelle roosts, respectively.

A single watercourse crossing was assessed as part of the Proposed Grid Connection. While no structure is present at the watercourse crossing, trees along the Proposed Grid Connection underground cabling route were assessed as having *Negligible* to *PRF-I* potential for roosting bats, i.e. *PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats* (Collins, 2023). However, these trees are to be retained as part of the Proposed Development.

Turbine delivery route (TDR) accommodation works will be required at two locations to facilitate the delivery of turbine components and other abnormal loads to the Proposed Wind Farm during the construction phase. In the townland of Durrow Townparks, Co. Laois, along the N77 national secondary road, existing trees, ornamental street furniture, signage and electricity/telecommunication poles will be temporarily removed for the duration of the turbine component delivery phase. Upon completion, the trees, ornamental street furniture, signage and electricity/telecommunication poles will be reinstated. The trees identified for temporary removal were assessed as providing *Negligible* suitability for commuting and foraging bats, with no potential roost features (PRFs) recorded. As such, a short-term loss of potential commuting and foraging habitat is anticipated, with no loss of roosting habitat.

6.4.7.5 Birds

A number of non-target, incidental bird species were recorded during the dedicated bird surveys and are listed in table 6-11 below, along their BoCCI Status (Red, Amber, or Green).

Table 6-11: Non-target bird Species recorded within the Proposed Development site.

Species	Latin	BoCCI Status
Barn Swallow	*Hirundo rustica*	BoCCI Amber List (Breeding)
Blackbird	*Turdus merula*	BoCCI Green List (Breeding)

Species	Latin	BoCCI Status
Blackcap	*Sylvia atricapilla*	BoCCI Green List (Breeding)
Blue Tit	*Cyanistes caeruleus*	BoCCI Green List (Breeding)
Bullfinch	*Pyrrhula pyrrhula*	BoCCI Green List (Breeding)
Chaffinch	*Fringilla coelebs*	BoCCI Green List (Breeding)
Chiffchaff	*Phylloscopus collybita*	BoCCI Green List (Breeding)
Coal Tit	*Periparus ater*	BoCCI Green List (Breeding)
Collared Dove	*Streptopelia decaocto*	BoCCI Green List (Breeding)
Cuckoo	*Cuculus canorus*	BoCCI Green List (Breeding)
Dunnock	*Prunella modularis*	BoCCI Green List (Breeding)
Feral Pigeon	*Columba livia f. domestica*	BoCCI Green List (Breeding)
Goldcrest	*Regulus regulus*	BoCCI Amber List (Breeding)
Goldfinch	*Carduelis carduelis*	BoCCI Green List (Breeding)
Great Spotted Woodpecker	*Dendrocopus major*	BoCCI Green List (Breeding)
Great Tit	*Parus major*	BoCCI Green List (Breeding)
Greenfinch	*Chloris chloris*	BoCCI Amber List (Breeding)
Hooded Crow	*Corvus corone*	BoCCI Green List (Breeding)
House Martin	*Delichon urbicum*	BoCCI Amber List (Breeding)
House Sparrow	*Passer domesticus*	BoCCI Amber List (Breeding)
Jackdaw	*Corvus monedula*	BoCCI Green List (Breeding)
Jay	*Garrulus glandarius*	BoCCI Green List (Breeding)
Lesser Redpoll	*Acanthis flammea*	BoCCI Green List (Breeding)
Linnet	*Linaria cannabina*	BoCCI Amber List (Breeding)
Long-tailed Tit	*Aegithalos caudatus*	BoCCI Green List (Breeding)
Magpie	*Pica pica*	BoCCI Green List (Breeding)
Mistle Thrush	*Turdus viscivorus*	BoCCI Green List (Breeding)
Pheasant	*Phasianus colchicus*	BoCCI Green List (Breeding)
Pied Wagtail	*Motacilla alba yarrelli*	BoCCI Green List (Breeding)
Raven	*Corvus corax*	BoCCI Green List (Breeding)

Species	Latin	BoCCI Status
Reed Bunting	*Emberiza schoeniclus*	BoCCI Green List (Breeding)
Robin	*Erithacus rubecula*	BoCCI Green List (Breeding)
Rook	*Corvus frugilegus*	BoCCI Green List (Breeding)
Sand Martin	*Riparia riparia*	BoCCI Amber List (Breeding)
Siskin	*Spinus spinus*	BoCCI Green List (Breeding)
Skylark	*Alauda arvensis*	BoCCI Amber List (Breeding)
Song Thrush	*Turdus philomelos*	BoCCI Green List (Breeding)
Spotted Flycatcher	*Muscicapa striata*	BoCCI Amber List (Breeding)
Starling	*Sturnus vulgaris*	BoCCI Amber List (Breeding)
Stock Dove	*Columba oenas*	BoCCI Red List (Breeding)
Stonechat	*Saxicola torquatus*	BoCCI Green List (Breeding)
Treecreeper	*Certhia familiaris*	BoCCI Green List (Breeding)
Whitethroat	*Sylvia communis*	BoCCI Green List (Breeding)
Willow Warbler	*Phylloscopus trochilus*	BoCCI Amber List (Breeding)
Woodpigeon	*Columba palumbus*	BoCCI Green List (Breeding)
Wren	*Troglodytes troglodytes*	BoCCI Green List (Breeding)

6.4.7.6 Ashy mining bee

The ashy mining bee (*Andrena cineraria*) which is a species of ground-nesting solitary bee, was recorded nesting within a section of an earth bank (associated with a hedgerow) north of Turbine 6 (See Plate 6-25 and 6-26) and (see Figure 6-10 for location of bank). The earth bank was south facing and was composed of dry, compact soil. Gorse and hawthorn was recorded in association with the bank. A farm track ran adjacent to the bank.

Plate 6-25: South facing dry clay bank located north of Turbine 6.

Plate 6-26: Ashy mining bee recorded nesting within bank north of Turbine 6.

6.4.7.7 Reptiles and Amphibians

Common frog and smooth newt have both been recorded within hectad S47 in which the Proposed Wind Farm site is located. One observation of common frog was recorded in an area of wet grassland near Turbine 4 during the field surveys carried out (see Figure 6-9) . No observations were made of smooth newt. No significant suitable breeding habitat (ponds) for common frog or smooth newt was identified within the Proposed Development site, however, smaller ponded areas and ditches across the site may provide some suitable breeding habitat for these species. Common lizard (*Zootoca vivipara*) have not been recorded within hectad S47 in which the Proposed Wind Farm site is located, and no observations of this species was recorded during the field surveys. The site does not have significant supporting habitat for common lizard, such as stone walls and it is also heavily managed via grazing of livestock and tilling for arable crops.

6.4.7.8 Other Fauna

Irish stoat were also recorded on one occasion at a potential mammal den near Turbine 6 (See Plate 6-27).

Plate 6-27: Stoat recorded by trail camera near Turbine 6.

Red fox was recorded on a single occasion however, suitable habitat is present throughout the Proposed Development site for the species (See Plate 6-28). Rabbit and hare were also recorded across the Proposed Development.

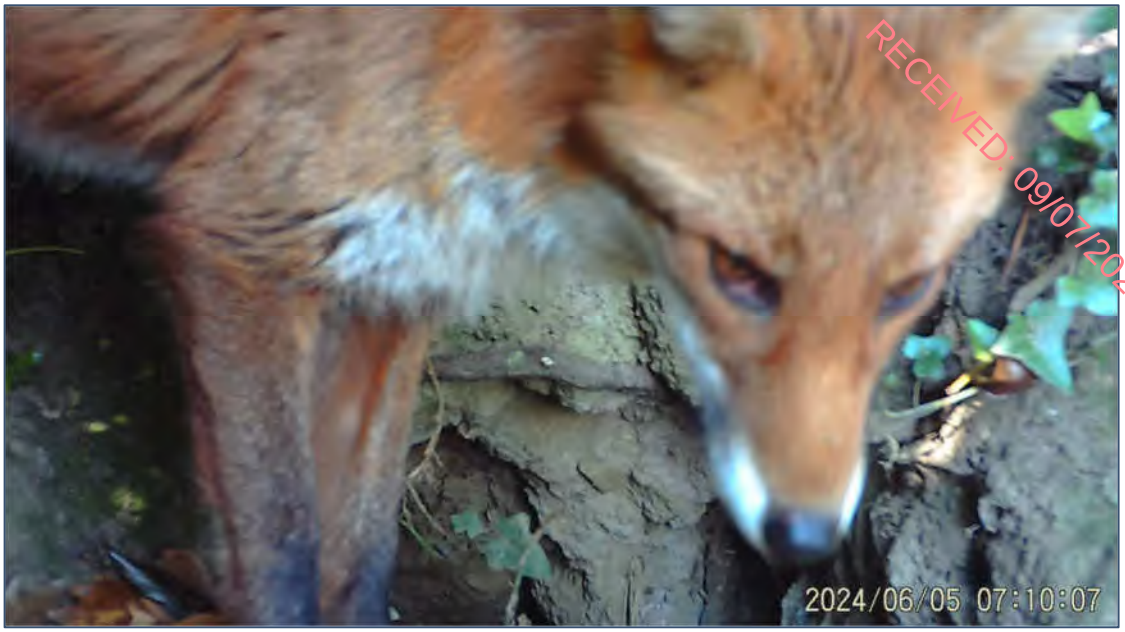
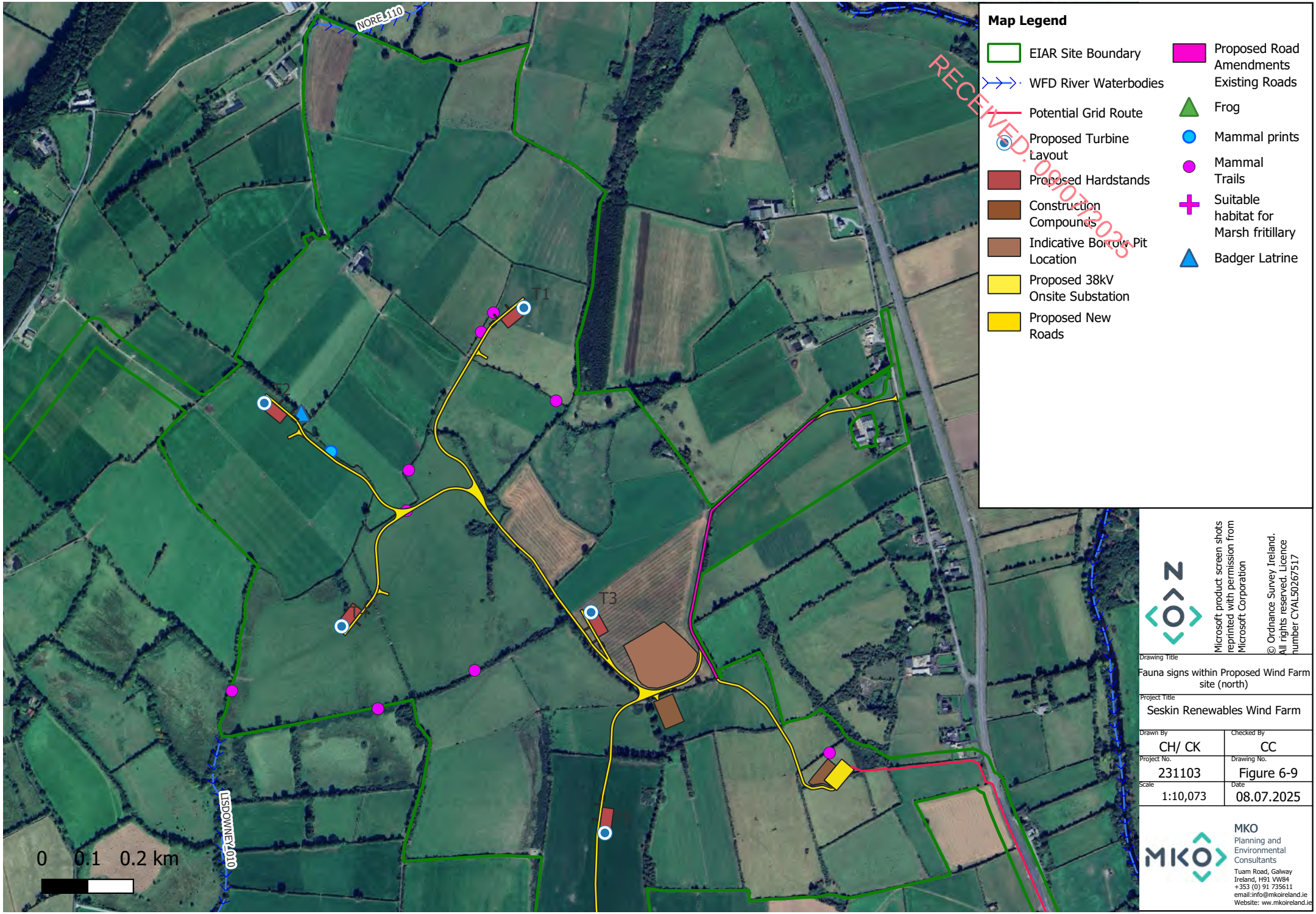


Plate 6-28: Fox recorded by trail camera.



Drawing Title: Fauna signs within Proposed Wind Farm site (north)

Project Title: Seskin Renewables Wind Farm

Drawn By	Checked By
CH/ CK	CC
Project No.	Drawing No.
231103	Figure 6-9
Scale	Date
1:10,073	08.07.2025

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Drawing Title
Fauna signs within the Proposed Wind Farm site (South)

Project Title
Seskin Renewables Wind Farm

Drawn By	Checked By
CH	CC
Project No.	Drawing No.
231103	Figure 6-10
Scale	Date
1:10,073	17.06.2025

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644000
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RECEIVED: 09/07/2025

Map Legend

- Otter holt with 20m buffer
- Otter spraints
- Snuffle holes copy
- Mammal Trails
- otter prints and trails
- HDD Launch Pit and Reception Pit
- Potential Grid Route
- WFD River Waterbodies
- Otter Holt 20m Buffer
- EIAR Site Boundary
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

SITE LOCATION - NOT TO SCALE

Drawing Title
Fauna signs along Proposed Grid Connection

Project Title
Seskin Renewables Wind Farm

Project No.	Drawing No.	Scale
231103	Figure 6-11	1:2,200
Drawn By	Checked By	Date
BOC	CC	12/06/2025

0 100 200 m

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6.4.8 Fisheries and Aquatic Fauna

Full details of results of aquatic surveys undertaken in July 2024 are provided in the Aquatic Baseline Report (Appendix 6-3) and are summarised in this section. All survey locations (n=9) are shown in Figure 1-1 and Figure 1-2 in the Aquatic Baseline report. The following summary has been extracted from the baseline report. In addition, otter surveys were also conducted along the Proposed Grid Connection route.

6.4.8.1 Watercourses

Watercourses surveyed within the vicinity of the Proposed Development Site consisted primarily of modified Eroding/Upland (FW1) watercourses, surrounded predominantly by agricultural and pastural land use. Consequently, many watercourses within the vicinity of the wind farm (WF 1– WF 5, sites inclusive) exhibited visible enrichment, with sewage fungus and excessive filamentous green algae growth across channel bed substrate. Despite the presence of abundant patches of sewage fungus as a result of surrounding, high activity urban land use, site WF 7 provided the highest value fisheries habitat, which displayed a river profile more closely associated with a Depositing/Lowland (FW2) river.

6.4.8.2 Fish Species

The following paragraphs summarise the fish species that were found during the aquatic baseline surveys. The below paragraphs should be read in conjunction with Figure 1-1 and Figure 1-2 (survey locations) in the Aquatic Baseline Report (Appendix 6-3):

- **Salmonids** were present at 5 no. sites in total, with **brown trout** present at 4 of these (i.e. WF 1, WF 2, WF5, WF 7) **Atlantic salmon** present at 3 of these (i.e. WF 3, WF 5, WF 7).
- **Cyprinidae** were present at one site in total, with **Minnow** present at 1 no. sites (i.e. WF 7)
- **European eel** was recorded at 3 sites (WF 2, WF 5, WF 7).

6.4.8.3 White-clawed crayfish & crayfish plague

No white-clawed crayfish were recorded via hand-searching or sweep netting of instream refugia during the survey and no crayfish remains were identified in otter spraint recorded during the survey. However, white-clawed crayfish was detected from eDNA surveys (discussed further below). Crayfish plague was not detected during the eDNA surveys.

6.4.8.4 eDNA analysis

White-clawed crayfish was detected from eDNA in a water sample collected from one site, WF 3. No crayfish eDNA was detected at any of the other sites. eDNA surveys provided no positive results for crayfish plague (*Aphanomyces astaci*) in the vicinity of the Proposed Development Site.

No freshwater pearl mussel eDNA was detected in the vicinity of the Proposed Development Site.

6.4.8.5 Kick-sampling and Q-Value

The following summarise the results of kick-sampling and Q-Value evaluation carried out:

No rare or protected macro-invertebrate species (according to national red lists) were recorded in the biological water quality samples taken from the 7 sites in July 2024. No rare or protected macrophytes/aquatic bryophytes were recorded at any of the aquatic survey locations.

Site WF 5 achieved **Q4 (good status)** water quality and thus met the target good status (≥Q4) requirements of the European Union Environmental Objectives (Surface Waters)(Amendment) Regulations 2019 and the Water Framework Directive (2000/60/EC). The sites WF 2 and WF 3 achieved **Q3-4 (moderate status),** while WF 1 and WF 7 achieved **Q3 (poor status).** Due to a lack of sufficiently wetted channel, kick-sampling and electrofishing could not take place at either survey site WF 4 or WF 6.

The biological water quality of the survey area was generally poor, with the majority of the water courses in the study area significantly impacted via eutrophication, siltation and or historical modifications (hydromorphology).

6.4.9 Identification of Key Ecological Receptors

Table 6-12 below summarises the ecological evaluation of all receptors as outlined in Section 6.2.4. It provides the rationale for the determination and identifies the habitats and fauna that are considered to be Key Ecological Receptors (KERs) and therefore those receptors that are subject to impact assessment and considered in Section 6.5 of this report. Following impact assessment, mitigation measures are incorporated into the Proposed Development where required, to avoid potential significant impacts on these KERs.

Table 6-12: Identification *of Key Ecological Receptors within the ZoI of the Proposed Development*

Ecological feature or species	Reason for inclusion as a KER	KER
Designated Sites		
European Designated Sites	The Proposed Development site is within the ZoI of two European sites, namely the: › River Barrow and River Nore SAC [002162] › River Nore SPA [004233] Potential for Likely Significant Effects (LSEs) on these European sites was identified within the AA screening for the Proposed Development. Potential impacts on these European site are assessed fully in the NIS for the Proposed Development. In the context of this Biodiversity Chapter these sites have been assigned **International Importance** and included as a KER as there is potential for direct and indirect effects on these European sites.	**Yes**
Nationally Designated Sites	The following Nationally designated sites were identified as being within the ZoI of the Proposed Development: › River Nore / Abbeyleix Woods Complex pNHA [002076] › Inchbeg pNHA [000836] › Ardaloo fen pNHA [000821] Potential for likely significant effects on these Nationally Designated sites was identified within Section 6.3.1.1 above. In the context of this Biodiversity Chapter, these sites have been assigned **National Importance** and are included as a KER as there is potential for indirect effects on these National sites via water pollution.	**Yes**
Habitats (Terrestrial)		
Linear Habitats - Treelines (WL2), Hedgerows (WL1)	Based on the hedgerow appraisal survey findings as outlined in Section 6.4.3 (and Appendix 6-1) hedgerows within the site have been assessed as being of **Local Importance (Higher Value)** given their high significance from a historical and biodiversity value (based on the range of flora and fauna they have been found to support within the site). Many of the hedgerows within the site are species rich. Treelines and mature trees associated within hedgerows have also been assessed as being of **Local Importance (Higher value).** These linear habitats provide connectivity to the wider landscape and supporting habitat for a wide variety of faunal species. In order to facilitate construction of the Proposed Development there will be loss of hedgerow and treeline habitat within the Proposed Wind Farm site. For this reason, these habitats have been identified for further assessment as a KER.	**Yes**

Ecological feature or species	Reason for inclusion as a KER	KER
Scrub (WS1)	Areas of scrub (WS1) have been assessed as being of **Local Importance (Higher Value)** as they provide foraging, nesting, breeding, resting and commuting habitat for a number of species including badger and bird species. There will be no loss of scrub associated with the construction of the Proposed Development and therefore has not been identified as a KER.	No
Improved agricultural grassland (GA1)/Wet grassland (GS4)/ Arable Crops	Most of the Proposed Wind Farm infrastructure is located within **Improved agricultural grassland (GA1).** A small amount of infrastructure is proposed to be located within areas of **Wet grassland (GS4**) and **Arable Crops (BC1)**. These are highly modified habitats, common throughout the wider landscape and of relatively low biodiversity value. They are intensively managed for farming and generally had low species diversity. These habitats have been classified as **Local Importance (Lower Value).** For these reasons, these habitats have not been identified as a KERs.	No
(Mixed) broadleaved woodland (WD1)/ (Mixed) broadleaved/conifer woodland (WD2)/ Wet Willow-alder-ash woodland (WN6)	Small areas of **(Mixed) broadleaved woodland (WD1), (Mixed) broadleaved/conifer woodland (WD2)** and **Wet Willow-alder-ash woodland (WN6)** were recorded within the Proposed Wind Farm site. Although these habitats are considered of **Local Importance (Higher value)**, there will be no loss of any of these habitats associated with the construction of any of the infrastructure and therefore, they have not been identified as a KER.	No
Buildings and Artificial Surfaces (BL3)	This habitat type is largely associated with artificial site access tracks throughout the Proposed Wind Farm site and along the Proposed Grid Connection Route, it has little biodiversity value. For these reasons, this habitat has not been identified as a KER.	No
Aquatic habitats		
Eroding upland rivers (FW1) and Depositing Lowland River (FW2)	The majority of the Proposed Wind Farm site drains into the River Nore via three watercourses the Archerstown (Lisdowney_101), Lisdowney Stream (Nore_140) to the south of the site, including its tributaries and the Durrow Townparks (Nore_110) watercourse which drains the northeast of the site to the River Nore just south of Durrow. The River Nore is crossed by the Proposed Grid Connection route. The River Nore has been assigned of **International Importance** given its designation as an SAC. Watercourses draining the site were assigned **Local Importance (Higher Value).**	**Yes**
Drainage ditches (FW4)	The majority of the drainage ditches within the Proposed Development site were associated with hedgerows (WL1) and Treelines (WL2) and were recorded as mainly dry. However, the drainage ditch located to the northwest of Turbine 8 was wet at the time of the survey and is hydrologically connected to the Lisdowney Stream, which drains into the River Nore further downstream. The drainage ditches are assessed as being **Local Importance** (Lower Value), however, they are being considered further as a KER due to their potential connectivity to higher value watercourses.	**Yes**
Swallow hole feature north of Turbine 6	The swallow hole feature located within the woodland north of Turbine 6 has not been identified as a KER given the findings as outlined in Section 6.4.5. Furthermore, the topography at T6 slopes to	**No**

Ecological feature or species	Reason for inclusion as a KER	KER
	the east, as such drainage from the turbine will not flow in the direction of the spring.	
Fauna		
Badger	Badger as an ecological receptor has been assigned **Local Importance (Higher Value).** An active main sett and a small number of outlier setts were recorded across the Proposed Wind Farm site. Therefore, potential for direct and indirect impacts on badger are considered further in this assessment and the species has been included as a KER for further assessment.	**Yes**
Otter	No signs of otter were recorded within the Proposed Wind Farm site, however, signs of otter including spraints, prints and feeding remains were recorded along the River Nore and the Proposed Grid Connection route. An active (non-breeding) otter holt was also recorded in proximity to the Proposed Grid Connection route where it runs adjacent to the River Nore. Potential for direct and indirect impacts on otter are therefore considered further in this assessment and the species has been included as a KER for further assessment. As otter are a QI of the River Barrow and River Nore SAC, this population is assigned **International Importance** and as such they are considered as a KER.	**Yes**
Pine marten / stoat	The Proposed Wind Farm site provides suitable foraging and breeding habitat for both pine marten and stoat. The site supports a locally occurring population of these species No breeding sites were confirmed for either species. No significant impacts on these species are predicted as a result of the Proposed Development with significant supporting habitat being retained within the site following construction of the Proposed Wind Farm. These species have been assessed as being of **Local Importance (Lower Value)** and therefore are not considered to be KERs.	No
Bats	The habitats within and surrounding the Proposed Wind Farm Site and Proposed Grid Connection Route are utilised by a bat population of **Local Importance (Higher Value)**. Bats have been recorded commuting and foraging across the Proposed Wind Farm Site. Two low-value roosts—used by common and soprano pipistrelle bats—were identified within the Proposed Wind Farm Site. These roosts are located outside of the turbine and infrastructure footprint and will be retained and avoided as part of the Proposed Development. Additionally, a number of mature trees containing potential roost features (PRFs) are present within the designated bat felling buffers. These trees were subject to daytime inspections, and no evidence of roosting bats was identified. The Proposed Development has the potential to result in direct and indirect effects on these receptors in the form of habitat loss, disturbance and impacts from turbine interactions. Therefore, bats have been included as a KER for further assessment.	**Yes**
Amphibians (common frog/smooth newt)	It is considered that the Proposed Development will not result in a significant loss of suitable habitat for amphibians, no significant breeding habitat for these species was identified within the site. No evidence of populations of amphibians being significant at more than a local level was recorded (single frog). No significant effects on these species are anticipated as a result of the Proposed Development.	No

Ecological feature or species	Reason for inclusion as a KER	KER
	These species have been assessed as being of **Local Importance (Lower Value)** and therefore are not considered to be KERs.	
Invasive species	No invasive species were recorded within the footprint of the Proposed Wind Farm site.	**No**
Breeding Birds	A number of non-target bird species were recorded during the dedicated bird surveys. Bird within the footprint of the Proposed Development site have been identified as of **Local Importance (Higher Value).** The treelines, hedgerows and grassland habitats within the footprint of the Proposed Development site provide suitable nesting and foraging habitat for common garden, woodland and farmland bird species.	
Additional fauna (e.g. Irish hare, rabbit, etc).	The recorded evidence suggests that the Proposed Development is not utilised by populations of higher than **Local Importance (Lower Value)** and no potential for significantly effects have been identified at the population level. Due to the small footprint and nature of the Proposed Development, they are unlikely to be significantly affected by the Proposed Development. For this reason, other faunal species are not considered as KERs and as such are not considered further in this assessment.	**No**
Aquatic and Fisheries Species		
Aquatic and Fisheries Species	Water courses downstream of the Proposed Wind Farm site and along the Proposed Grid Connection Route are known to support a number of aquatic species (see Section 6.4.1.2 and Appendix 6-3 Aquatic baseline report for further detail). Salmonid spp. were present at WF 1, WF 2, WF3, WF 5, WF 7, while cyprinidae spp. were present at site WF 7. European eel were recorded at WF 3, WF 5, and WF 7. Some watercourses within the site are hydrologically linked to downstream watercourses (and aquatic fauna within them) which have been assigned as of **International Importance** due to their designation as an SAC or as QI's of the SAC (e.g. otter, salmon, white-clawed crayfish etc.). Populations of eel downstream would also be considered of **Local Importance (Higher Value).** There is potential for indirect effect on these ecological receptors as a result of impacts on water quality. Fish and other aquatic species are therefore included as a KER for further assessment.	**Yes**

6.5 Ecological Impact Assessment

6.5.1 Do-Nothing Effect

If the Proposed Development were not to proceed, it is unlikely that any changes would be made to the current land use practice. The majority of the lands within the Proposed Development area would continue to be managed as they are now, either as improved agricultural grassland and associated grazing. The other habitats identified within the Proposed Wind Farm site and Grid Connection Route, including treelines, hedgerows, woodland, watercourses etc. would likely remain in a similar condition.

In some areas where scrub succession is establishing, this scrub may develop if not managed by the landowners and in time, this may undergo succession to small areas of woodland. The general biodiversity on the Proposed Wind Farm site and Grid Connection Route, as described in this chapter, would likely remain similar to its current state as activity levels and land use would not change.

6.5.2 Likely Significant Effects During Construction Phase

6.5.2.1 Effects on Habitats During Construction

Table 6-13 below provides details of the extent of the habitats that will be lost to facilitate the footprint of the Proposed Development. The Proposed Development will result in the loss of approx. 4.77ha of improved agricultural grassland (GA1) and 0.23ha of Arable crops (BC1) all of which have been assessed as being of Local Importance (lower value). The loss of these common and widespread habitats is not considered significant at any geographic scale as discussed in Table 6-12 above.

Buildings and artificial surfaces (BL3) are present along existing farm tracks within the footprint but were not mapped in detail and this habitat is therefore not listed below. A map showing the Proposed Development footprint overlaying the habitat map is provided in Figure 6-5 and Figure 6-6.
The area of non-KER habitats to be lost is included in the table below for completeness but these habitats are not discussed further in the assessment.

Table 6-13: Habitats occurring within the site.

Habitat (KER	Area to be lost to development footprint (hectares(ha)/kilometers(km)	KER?
Improved agricultural grassland (GA1)	4.77ha	No
Arable Crops (BC1)	0.23ha	No
Linear habitats: Hedgerows (WL1) and Treeline (WL2)	1.8km	**Yes**

The Proposed Grid Connection Route will not result in any significant habitat loss. The works will be restricted to the existing road (N77) categorised as Buildings and Artificial Surfaces (BL3) for the majority of the route. The Grid Connection will result in the temporary loss of agricultural grassland and approximately 6m of hedgerow to facilitate the grid route through two fields into Ballyragget substation (see Figure 6.11). This habitat loss is not significant at any geographic scale.

The effects on habitats that are identified as KERs are described in the below tables.

6.5.2.1.1 Assessment of Potential Effects on Linear Habitats - Hedgerow (WL1) and Treeline (WL2)

Table 6-14: Assessment of Potential Effects on Linear Habitats - Hedgerow (WL1) and treeline (WL2)

Description of Effect	The footprint of the Proposed Wind Farm, including new internal roads, road widening, and construction of the turbines, will result in the loss of 1.8 km of linear habitats comprising hedgerow and treeline habitat.
Assessment of Significance prior to mitigation	The permanent loss of these habitats is considered to be significant at a local geographic scale as these habitats, although not widespread within the Proposed Development site, are widespread and common within the local farmlands surrounding the Proposed Development. Removal of the hedgerows has the potential to cause fragmentation of habitat connectivity within the landscape. The loss of approx. 1.8km of linear habitats, which equates to 6% of the total length of this habitat type within the EIAR Site Boundary, is considered **significant at the local geographic scale only.**
Mitigation	In order to compensate for the loss of 1.8km of linear habitats, 2.1km of hedgerow reinstatement and 2.4km of hedgerow enhancement will be undertaken within the Proposed Development site. Hedgerow reinstatement will comprise both translocation of existing hedgerows and new hedgerow planting across the site associated with any new or realigned access tracks and well as planting within existing agricultural fields. The locations for hedgerow reinstatement (proposed planting and translocation) have been considered to ensure connectivity within the wider landscape for fauna species, in particular bats, and also in consultation with the landowners who are supportive of the proposal. The proposed reinstatement areas are presented in Figures 2-3 and 2-4 of the Biodiversity Management and Enhancement Plan (BMEP) (Appendix 6-4). This will result in a net gain in this habitat within the site. Species planted in these locations will be of a similar composition to those occurring on site and will be of local provenance. Translocation of hedgerows will also help with retention of the ground flora seed bank associated with hedgerows on site. Further details with regard to species, planting locations and management is contained within the BMEP.
Residual Effect following Mitigation	Following implementation of mitigation, no potential for significant residual effect exists at any geographic scale in the long-term. However, there will be a **negative residual effect at the local geographic scale in the short to medium term**[16] (5-15 years) while newly planted hedgerows across the site establish into mature hedgerows.

[16] *Duration of effects defined in line with EPA guidance (Section 3 page 51) https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf (accessed May, 2025).*

6.5.2.1.2 Assessment of Potential Effects on Groundwater, Surface Watercourses and Sensitive Aquatic Faunal Species

Table 6-15: Potential for impact on Watercourses and Sensitive Aquatic Species

Description of Effect	The effects on water quality are fully described in Chapter 9 'Water' of this EIAR and are described here in relation specifically to ecology. This section assesses the potential for likely significant effects on groundwater/surface watercourses and associated aquatic faunal species, including, lamprey, white-clawed crayfish, European eel, salmonids, coarse fish, and other aquatic species identified during the desk study and dedicated aquatic surveys and likely to occur within or downstream of the Proposed Development site. **Surface Watercourses (and associated aquatic species)** *Direct impacts (mortality)* There are two minor surface water pathways which exist between the Proposed Wind Farm site and downgradient watercourses (Archerstown stream and Ballyconra stream). Surface water in the area of T4 will drain southwest towards the Archerstown stream which is situated 380m from T4. Surface water from T8 may drain towards a field drain which leads to the Ballyconra stream. This field drain is 50m from T8. A new watercourse crossing will be emplaced at this location (field drain northwest of turbine T8. The Proposed Grid Connection underground cabling route includes a total of 1 no. new crossing over the River Nore. Horizontal Directional Drilling (HDD) will be utilised for this proposed crossing. A detailed description of the HDD construction method to be employed is described in Chapter 4 (Section 4.8.2.4.1) of the EIAR. No instream works are required as part of the proposed development as such there is no potential for direct impacts on any aquatic receptors associated with the Proposed Wind Farm and Proposed Grid Connection Route. *Indirect impacts (water quality)* As noted above, direct surface water pathways exist between the Proposed Wind Farm site and downgradient watercourses. There is a risk that pollutants and sediment laden surface water run-off could discharge to surrounding ditches and watercourses impacting on sensitive watercourses and aquatic species downstream including QI species associated with the River Nore SAC. Potential sources of pollution to surface waters within the Proposed Wind Farm site and along the Proposed Grid Connection Route: › Hydrocarbons and cement bound products › Slit laden surface water run-off; › Drainage and seepage water resulting from infrastructure excavations; › Stockpiled excavated material providing a point source of exposed sediment; › Construction of the Grid Connection underground cabling, resulting in entrainment of sediment from the excavations during construction; and, › Erosion of sediment from emplaced site drainage channels (although these are limited in scale and channel length). **Groundwater** Potential effect on groundwater flows and ground water levels are detailed in Chapter 9 (Hydrology). Significant impacts on groundwater are not predicted and site investigations did not identify any significant karst features within the underlying bedrock. No groundwater level effect are anticipated from the construction of the

	Proposed Wind Farm or Grid Connection Route. Furthermore no groundwater dependent habitats or species were identified within the Proposed Windfarm Site.
Assessment of Significance prior to mitigation	In the absence of mitigation and following the precautionary principle, there is potential for works associated with the Proposed Wind Farm site and Proposed Grid Connection Route works to result in a significant indirect effect on the identified aquatic habitats and species at a **local geographic scale** in the form of pollution during the construction phase. This would also result in impacts on aquatic receptors ranging from **Local (Higher Value)** to a receptor of **International Importance** (i.e. the River Barrow and River Nore SAC and associated QI species).
Mitigation	Detailed mitigation measures in relation to the protection of surface water during construction is detailed in Chapter 9 (Hydrology). Mitigation measures relating to the protection of surface water drainage regimes and surface water quality within the Site have been detailed in Section 9.4.2.1 (earthworks), Section 9.4.2.5 (surface water), Section 9.4.2.6 (hydrocarbons), Section 9.4.2.7 (wastewater), Section 9.4.2.8 (cement-based products) and Sections 9.4.2.9 and 9.4.2.10 (morphological changes). Although no significant impacts to groundwater are predicted as part of the development of the Proposed Development, measures to protect groundwater during construction are included in Section 9.4.2.2 (groundwater recharge), Section 9.4.2.3 (groundwater levels), Section 9.4.2.4 (piled foundations), Section 9.4.2.6 (hydrocarbons), Section 9.4.2.7 (wastewater) and Section 9.4.2.8 (cement- based products). In summary the key mitigation measure during the construction phase is the avoidance of sensitive aquatic areas where possible, by application of suitable buffer zones (i.e. 50m to main watercourses, and 10m to all mapped drains). A self-imposed buffer zone of 50m has been put in place for on-site streams. All of the key infrastructure areas are located significantly away from the delineated 50m watercourse buffer zones with the exception of the new watercourse crossing included as part of the development along the Grid Connection route, whereby the River Nore will be crossed by HDD, however, the launch pits will be located 50m from the River Nore. Mitigation measure in relation to site drainage and design is also included in Section 4.6 (Chapter 4 of this EIAR). This section provides details of how water quality will be protected during the construction of the Proposed Wind Farm site including a drainage plan. The drainage and maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works with regular inspections of all installed drainage systems undertaken throughout the Proposed Development. The Proposed Development design has been optimised to utilise the existing infrastructure (i.e. existing site roads) where practicable. Only 1 no. new crossing is proposed. • The proposed new stream crossing will be clear span crossing and the existing banks will remain undisturbed. No in-stream excavation works are proposed at these locations and therefore there will be no direct impact on the stream at the proposed crossing locations. Abutments will be constructed from precast units combined with in-situ foundations; • All guidance / mitigation measures required by the OPW and/or the Inland Fisheries Ireland (IFI) is incorporated into the design of the proposed crossings; • All drainage measures will be installed in advance of the works; • Plant and equipment will not be permitted to track across the watercourse; • A foundation base will be excavated to rock or competent ground with a mechanical excavator with the foundation formed in-situ using a semi-dry concrete lean mix. The base will be excavated along the stream bank with no instream works required;

	• Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of a temporary precast concrete or metal bridge across the watercourse to provide temporary access for the excavator. Plant and equipment will not be permitted to track across the watercourse; • Once the foundation base has been completed, the clear-span structure will be installed with no contact with the watercourse; • Once the crossing is in position stone backfill will be placed and compacted against the structure up to the required level above the foundations; • As a further precaution, near stream construction work, will only be carried out during the period permitted by IFI for in-stream works according to the IFI (2016) guidance document "*Guidelines on protection of fisheries during construction works in and adjacent to waters*", i.e., July to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI); • Where works are necessary inside the 50m buffer double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase; and • All new river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent.
Residual Effect following Mitigation	Following the implementation of mitigation, there will be no significant residual effect on aquatic habitats or species as a result of the Proposed Development.

6.5.2.2 Effects on Fauna During Construction

The Proposed Development has the potential to result in habitat loss and disturbance impacts on faunal species included as KERs, see Table 6-12. Therefore, these species were taken forward for further assessment. The following species have been brought forward for further assessment, as identified in Table 6-12:

- Badger
- Otter
- Bats

The potential for significant effects on aquatic species is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Section 6.5.2.1.2 above and is not repeated below.

6.5.2.2.1 *Assessment of Potential Effects on Badger*

Table 6-16: Assessment of Potential Impacts on badger

Description of Effect	**Habitat Loss/Fragmentation** Given the nature of the Proposed Development, there will be some minimal loss of suitable badger foraging habitat i.e., agricultural grassland (GA1), associated with the footprint of the Proposed Wind Farm infrastructure. However, this habitat loss will not be significant in the context of the widespread alternative foraging habitat available within the site and the

	wider area surrounding the site. There will be no significant loss/fragmentation of badger habitat as a result of the Proposed Development. **Disturbance/Mortality** One active main badger sett and a number of outlier setts were recorded across the Proposed Wind Farm site. Badger were also recorded by camera traps during surveys. Noise and earth works during construction have the potential to disturb badgers occupying setts in close proximity to Proposed Wind Farm infrastructure during construction. Badger tunnel systems can extend some distance from sett entrances (over 20m in some cases[17]) and therefore any excavation by heavy machinery in close proximity to sett entrances risks causing damage to setts and/or direct harm to badgers in the absence of mitigation. The confirmed active main sett is located approximately 136m from the nearest infrastructure as such there will be no direct impacts on the badger sett or any other potential setts identified across the site (all are over 100m from nearest infrastructure). However, numerous signs of badger activity was recorded within the site (latrines, snuffle holes, prints). There is potential for new badger setts to be created or disused (outlier setts) to become active again during the interim between baseline ecological surveying and commencement of construction, therefore a potential for impact via disturbance/mortality of badger exists should new setts be created in close proximity to the development works. In the event that a new badger sett is established within or near the footprint of the Proposed Wind Farm during the interim between baseline ecological surveys and commencement of construction, there is potential for disturbance/mortality to badger using the setts as a result of noise/tunnel or sett collapse during construction.
Assessment of Significance prior to mitigation	**Habitat Loss/Fragmentation** No significant overall loss or fragmentation of badger foraging habitat is anticipated at any geographic scale. **Disturbance/Mortality** Any potential for physical damage or significant disturbance of occupied setts (if established prior to construction) would be considered **significant at the local geographic scale** in the absence of mitigation.
Mitigation	**Habitat Loss/Fragmentation** No specific mitigation is required for habitat loss. **Disturbance/Mortality** Due to time that can elapse between the original surveys, any future planning consent and construction, a pre-construction badger survey will be carried out to identify the presence of any new setts that may have been established in the intervening period. Any setts identified within 50m of the Proposed Wind Farm infrastructure will subsequently be monitored for a minimum period of 2 weeks using remote cameras in order to ascertain use by badgers and levels of activity. If an active badger sett is identified and works can be undertaken safely (as to avoid sett collapse) then an exclusion zone will be set up around the sett as follows: › Exclusion zone fencing and appropriate signage will be put in place between working areas and badger sett exclusion zones to ensure that there will be no encroachment of the badger sett exclusion zones by construction activities. If a newly established and active sett was identified within an area where works could not avoid direct impacts on the sett then the sett would likely need to be excluded prior to

[17] *National Roads Authority (2006a) Guidelines for the treatment of badgers prior to the construction of National Road Schemes.*

	works commencing. This would need to be undertaken in line with current guidelines by an appropriately qualified ecologist in advance of construction works commencing.
Residual Effect following Mitigation	Following the incorporation of the mitigation measures described above, no significant negative effects to badger is anticipated at any geographic scale.

6.5.2.2.2 Assessment of Potential Effects on Otter

Table 6-17: Assessment of Potential Impacts on otter

Description of Effect	Watercourses within The Proposed Wind Farm site were not suitable to support otter, however, number signs of otter were recorded at water courses in the wider area as outlined in Aquatic Baseline Report (see Appendix 6-3). The Proposed Grid Connection crosses one watercourse, the River Nore. Multiple signs of otter were recorded along this section of the River Nore. A confirmed non-breeding otter holt was recorded over 45m from the Proposed Grid Connection underground cabling route and over 150m from the proposed HDD launch pit. The holt was in regular use by a single individual during the time of camera deployment. Based on the footage captured it is not considered to be a breeding holt. **Habitat Loss/Fragmentation, Disturbance, Mortality** For the Proposed Grid Connection Route, only minor underground cabling installation works are proposed within the verge of the public road (N77) while crossing of the Nore will be by HDD. Given the proposed works no significant habitat loss will occur affecting otter. There will be no loss of holts/resting sites related to the proposed works and all works will be outside any zone of disturbance for otter (150m for breeding natal holts and 20m for active non-breeding holts). Therefore, there is no potential for the Proposed Development to result in mortality, habitat loss/fragmentation for otter and no significant disturbance impacts are predicted. Given the scale and nature of the works and distance from the non-breeding holt no significant impacts to otter are predicted. No works will be undertaken within 20m of the otter holt. **Habitat Degradation (impacts on water quality)** Otter have been confirmed as using the River Nore for commuting and foraging. There is potential for construction works to result in the run-off of silt and other pollutants such as hydrocarbons and cementitious material into watercourses downstream of the Proposed Wind Farm and along the Proposed Grid Connection Route. This represents a potential indirect effect on otter in the form of habitat degradation/loss of prey resource through water pollution.
Assessment of Significance prior to mitigation	**Habitat Loss/Fragmentation, Disturbance, Mortality** Significant effects regarding habitat destruction, barrier effect, disturbance and mortality are not anticipated as a result of the Proposed Development. **Habitat Degradation (impacts on water quality)** Although otter as a KER has been valued of international importance (due to otter being a qualifying interest species of the nearby SAC) water quality impacts if they did occur in the absence of mitigation would be considered **significant at the local geographic scale only**.
Mitigation	Given that otter were found to be very active in the vicinity of the Proposed Grid Connection route and due to time that can elapse between the original surveys and any future planning consent and construction, a pre-construction otter survey will be

	carried out to identify any changes to the baseline in the intervening period. Any changes to the baseline would need to be addressed following National and European legislation. Detailed mitigation measures in relation to the protection of surface water during construction would be the same as outlined in Section 6.5.2.1.2 above. In addition, a 20m exclusion zone will be demarcated around the confirmed non-breeding otter holt to ensure no significant disturbance effects to this species during works.
Residual Effect following Mitigation	Following the incorporation of the mitigation measures described above, no significant negative effects to otter is anticipated at any geographic scale.

6.5.2.2.3 *Assessment of Potential Effects on Birds*

Table 6-18: Assessment of Potential Impacts on birds

Description of Effect	**Loss of bird nesting habitat** The loss of habitats (grassland/linear features) potentially utilised by local farmland nesting bird species would not be considered significant at any geographic scale given that there is ample bird nesting habitat in the immediate and wider landscape. **Disturbance/ Mortality** The trees, hedgerow and grassland habitats within the existing site provide suitable nesting habitat for a range of bird species. If site/vegetation clearance coincided with the bird nesting season, it would likely result in the mortality/disturbance to nesting birds.
Assessment of Significance prior to mitigation	**Disturbance/Mortality** Mortality/disturbance bird species as a result of vegetation clearance in the nesting season would be considered significant **at the local geographic scale.**
Mitigation	**Disturbance/Mortality** To avoid disturbance/mortality impacts to nesting birds', vegetation clearance will be undertaken outside the bird nesting season which runs from the 1st of March to the 31st of August. Any cutting vegetation that may be required outside the season described above will be supervised by a suitably qualified ecologist to ensure that no bird nests are present. Should nesting birds be encountered, the trees/vegetation will be left until nesting activity has ceased.
Residual Effect following Mitigation	With the implementation of mitigation measures outlined above no significant residual effects are anticipated on local bird populations as a result of the Proposed Development.

6.5.2.2.4 Assessment of Potential Effects on Bats

The impact assessment in relation to bats has been undertaken in accordance with NIEA[18] and NatureScot Guidance[19]. As per the NatureScot Guidance, wind farms present five potential risks to bats:

- Collision mortality, barotrauma and other injuries
- Loss or damage to commuting and foraging habitat
- Loss of, or damage to, roosts
- Displacement of individuals or populations
- Disturbance

For each of these five risks, the detailed knowledge of bat distribution and activity within the site has been utilised to predict the potential effects of the Proposed Development on bats. Potential risk of collision, barotrauma and other injuries relate to the operational phase and are presented in Section 6.6.3.2.1.

Table 6-19: Assessment of Potential Impacts on Bats

Description of Effect	**Loss of, or Damage to, Roosts** Two low value bat roosts (each supporting 2 individuals) were identified within the Proposed Wind Farm site. Additionally, three structures with some potential suitability for roosting bats were recorded; however, none of these will be directly impacted by the Proposed Development. The Site primarily comprises agricultural grassland, with hedgerows containing mature trees that offer roosting potential for bats delineating field boundaries. Some hedgerow removal will be required to facilitate the creation of the bat felling buffers (refer to Section 6.1.3 of the Bat Report). However, no roosts were identified during the surveys undertaken and no direct loss of identified roosts is anticipated. Along the Proposed Grid Connection Route, no tree or forestry removal is proposed; therefore, no loss of potential tree roosting habitat is expected. At the River Nore water crossing, Horizontal Directional Drilling (HDD) is proposed. As there are no structures present at the crossing point, no significant effects on roosting bats are anticipated in this area. Furthermore, there will be no loss of potential roosting habitat associated with the turbine component delivery route.
	Loss or Damage to Commuting and Foraging Habitat In the absence of appropriate design, the loss or degradation of commuting and foraging habitat has the potential to reduce feeding opportunities and/or displace local bat populations. During surveys, bats were observed foraging and commuting along hedgerows and treelines throughout the Proposed Wind Farm site, which features linear habitats of varying maturity. The development of the Proposed Wind Farm will involve the construction and/or widening of access roads and tracks, the installation of associated infrastructure, and the implementation of the bat felling buffers which will require the felling of existing trees and hedgerow.

[18] *Northern Ireland Environment Agency Natural Environment Division (NED) published Guidance on Bat Surveys, Assessment and Mitigation for Onshore Wind Turbine Developments in Northern Ireland (NIEA, 2021).*
[19] *NatureScot published Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation. Version: August 2021 (NatureScot, 2021).*

	Approx. 1.8km of hedgerow habitat will be permanently removed within and around the footprint of the Proposed Wind Farm. Vegetation removal is necessary both to facilitate construction and to achieve the required buffer distance for the protection of bats, from the turbines to the canopy of the nearest habitat feature, as recommended by the Natural England (2014) and NatureScot (2021). Further details on buffer calculations can be found in Section 6.1.3 of the Bat Report (Appendix 6-2).
	Displacement of Individuals or Populations The Proposed Wind Farm is predominantly located within agricultural grasslands surrounded by a network of linear features. A number of trees and hedgerows within the bat felling buffers to be removed provide potential roosting and foraging/commuting habitat.
	Disturbance Factors such as increased noise and artificial lighting during construction have the potential to lead to displacement and disturbance effects on bats where working hours coincide with periods of bat activity.
Assessment of Significance prior to mitigation	**Loss of, or Damage to, Roosts** All structures will be avoided as part of the Proposed Project, and thus no significant loss or damage to the identified or potential roosts within buildings/structures is anticipated. A number of trees identified during the roost surveys as having potential to host roosting bats were located within the bat mitigation buffers detailed in Section 6.1.3. No evidence of bat use was identified during daytime inspection of the trees. However, a potential for indirect effects on bats was identified in the form of loss of roosting habitat resources, as well as direct effects such as temporary disturbance and harm or death as a result of the proposed hedgerow removal. Loss of tree roosting habitat therefore represents a potentially significant effect on bat populations at the local level. No damage to potential roosting habitat is expected along the Proposed Grid Connection route as a result of the proposed works. Construction works associated with the turbine delivery route (TDR) have the potential to result in effects considered temporary in nature and are unlikely to represent a significant effect on local populations.
	Loss or Damage to Commuting and Foraging Habitat A degree of foraging and commuting habitat loss will occur within the Site to facilitate the construction of infrastructure and from the implementation of bat felling buffers, as detailed in Section 6.1.3 of the Bat Survey Report (see Appendix 6-2), as well as new road construction, and construction works. In the absence of mitigation, this loss of commuting and foraging habitat represents a potentially significant effect on bat populations at the local level.
	Displacement of Individuals or Populations There will be no net loss of linear landscape features for commuting and foraging bats and there will be no loss of any roosting site of ecological significance. The habitats on the Proposed Wind Farm site will remain suitable for bats and no significant displacement of individuals or populations is anticipated.
	Disturbance Potential disturbance as a result of an increase in noise and artificial lighting during the construction phase represents a potential short-term not significant effect on local bat

	populations. Impacts from noise and lighting have the potential to result in temporary negative effects on the bat populations recorded at the site during construction, this would be considered significant at the local geographic scale only in the absence of mitigation.
Mitigation	**Loss or Damage to Commuting and Foraging Habitat** Linear vegetation features within the turbine bat buffers will be removed. A replanting plan has been designed to ensure habitat connectivity continues throughout the site and bats are not directed towards proposed turbines. To comply with NatureScot recommendations in relation to habitat buffering to avoid bat fatalities and including the removal of linear habitat to facilitate new roads, a total of 1.8km of hedgerow/tree habitat will be removed. There is an extensive network of existing linear landscape features in the wider area that will be retained, and the loss of hedgerow/trees is not anticipated to have a significant effect on local bat populations. However, it is proposed to plant new linear features and bolster existing habitat features to offset any potential loss in linear habitat features and to provide additional new opportunities for commuting and foraging bats. Approximately 2.4km of heavily managed hedgerow will be enhanced through additional planting with native species. It is proposed to plant native tree species within the hedgerow habitat to further increase the biodiversity value within the Site. In total 2.1 km of hedgerow reinstatement and 2.4 km of hedgerow enhancement will be undertaken within the Proposed Development site. The enhancement of existing hedgerows, translocation of existing hedgerow and hedgerow creation will improve the ecological value and provide benefits for commuting/foraging bats. Please refer to Appendix 6-4 for full details of the Biodiversity Management and Enhancement Plan (BMEP). The proposed mitigation will result in a net gain of linear habitat features within the Proposed Wind Farm site.

	Loss of, or Damage to, Roosts
	
	Structures:
	No specific mitigation proposed.
	
	Trees:
	A number of mature trees presenting potential roosting features were identified within the bat buffers. Areas subject to removal are shown in Figure 6-1. Although no evidence of bats was found at these locations during the inspections, bats comprise mobile species that can move regularly between tree roosts. As such, the trees with potential roosting features have been considered as a “roost resource” and recommendations have been provided to account for the loss of the resource. The following procedures are proposed prior to removal of trees with PRFs:
	
	› A pre-commencement survey will be carried out by a suitably qualified ecologist on trees with PRFs proposed for removal
	› If a bat roost is identified within any of the trees to be removed/pruned, a bat derogation licence will be obtained from the NPWS, prior to removal and the removal activity will be supervised by a qualified ecologist.
	› On a precautionary basis, works will be undertaken at an appropriate time of year, as determined by a suitably qualified ecologist, to avoid disrupting sensitive life cycle periods for bats. Removal of mature deciduous trees will be carried out according to the following standard mitigating procedures:
	  › Trees with suitable potential roost features proposed for removal will be checked for bats by a suitably qualified arborist/ecologist at the time of removal.
	  › Trees will be nudged two or three times prior to limb removal, with a pause of 30 seconds in between, to allow bats to wake and move.

- Rigged tree removal shall be used to lower the limbs and trunk carefully to ground level and cavities searched by a qualified ecologist.
- Felled trees will be left in-situ for a minimum of 24 hours prior to sawing or mulching, to allow any bats present to escape (National Roads Authority, 2006b).

Replacement features for the loss of trees will be introduced by providing alternative potential roosting features through the provision of bat boxes:

- A bat box monitoring scheme is proposed in Appendix 6-4 BMEP of the EIAR to provide additional roosting opportunities throughout the site.

Displacement of Individuals or Populations

No significant displacement effects on bats are anticipated. Nonetheless, the following best practice and site-specific mitigation measures will be employed to avoid and reduce the potential for significant displacement/ disturbance effects on local bat populations (as fully detailed in Section 6 of the Bat Survey Report (Appendix 6-2):

Habitat Connectivity
Additional enhancement planting and hedgerow creation have been proposed to offset the loss of linear commuting and foraging habitat utilised by local bats. In total, 5.3km of hedgerow enhancement, translocation and creation are proposed within the Site. Species proposed for planting will enhance the existing linear features and create new routes for commuting and foraging bats. The proposed enhancement and creation planting areas within the Site have been carefully selected to reduce any risks of bats collision with operational turbines.

A full description of the mitigation measures proposed during construction are described in Section 6.1 of the Bat report, available in Appendix 6-2.

Disturbance

Noise Restrictions
During the construction phase, plant machinery will be turned off when not in use and all plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001SI 359/1996).

Lighting Restrictions
Where lighting is required, directional lighting will be used to prevent overspill on to woodland/forestry edges. Exterior lighting, during construction (and post construction), shall be designed to minimize light spillage, thus reducing the effect on areas outside the Site, and consequently on bats i.e. Lighting will be directed away from mature trees/treelines around the periphery of the Site boundary to minimize disturbance to bats. Directional accessories can be used to direct light away from these features, e.g. through the use of light shields (Stone, 2013). The luminaries will be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands.

Pre-construction Inspection Survey

Where trees with identified PRFs are proposed for removal, a pre-confirmatory inspection will be carried out by a suitably qualified ecologist prior to removal to ensure there are no bats present. The requirement for a pre-construction survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. The function of this survey will be to assess any changes in baseline environment since the time of undertaking the surveys in 2023/2024.

Residual Effect following Mitigation	Taking into consideration the sensitive design of the Proposed Development, the proposed best practice and adaptive mitigation measures, significant residual effects on bats as a result of loss or damage to roosts, displacement of individuals or populations, and disturbance, are not anticipated. Following implementation of mitigation in relation to replating and enhancement of linear features across the site, no potential for significant residual effect on commuting and foraging bats is likely in the long-term. However, there will be a **temporary residual effect at the local geographic scale in the short to medium term**[20] (5-15 years) on foraging and commuting bats while newly planted hedgerows across the site establish into mature hedgerows.

6.5.3 Likely Significant Effects During Operational Phase

6.5.3.1 Effects on Habitats during Operation

The operation of the Proposed Development will not result in any additional land take or loss of habitats and as such there is no potential for any significant effects in this regard.

The implementation of the Biodiversity Management and Enhancement Plan (see Appendix 6-4) will ensure that any treeline or hedgerow habitats lost to facilitate the Proposed Development will be replaced within the site.

6.5.3.2 Effects on Fauna during Operation

Potential for significant effects on bat species resulting from the operation of the Proposed Development were identified and therefore, these are identified as KERs during the operational phase and discussed further in Section 6.6.3.2.1 below.

There is no potential for significant negative effects on non-volant terrestrial fauna (otter, badger, pine marten, stoat) during the operational phase of the Proposed Development. Implementation of the Biodiversity Management Plan measures during the operational phase of the development will result in a net gain of linear features of value for local faunal species, providing more foraging opportunities for fauna, as well as additional shelter for birds and mammals, and commuting links for bats.

6.5.3.2.1 *Assessment of Potential Effects on Bats during operation*

Potential for significant effects on bat species resulting from the operation of the Proposed Development were identified in the form of collision mortality, barotrauma and other injuries.

Table 6-20: Assessment of Potential Effects on Bats

Description of Effect	The following high-risk species were recorded during the dedicated surveys: › Leisler's bat, › Common pipistrelle › Soprano pipistrelle › Nathusius' pipistrelle Together with the following low risk species: › *Myotis spp.* › Brown long-eared bat

[20] *Duration of effects defined in line with EPA guidance (Section 3 page 51) https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf (accessed May, 20205).*

	Overall activity levels for brown long-eared bat and *Myotis spp.* were generally low. While there was High median activity recorded for brown long-eared bat at D08 in spring, the overall activity levels for the species were low; therefore, no significant collision related effects are anticipated. Site-level collision risk for high collision risk bat species was typically Medium, except for Nathusius' pipistrelle, for which was considered Low. However, following per detector analysis, detectors D02, D03, and D05 showed high median activity levels across at least one season, in particular for Leisler's bat and common and soprano pipistrelles.
Assessment of Significance prior to mitigation	No significant collision related effects are anticipated on *Myotis* spp. and brown long-eared bats, as the species are considered low-risk for collision. A potential for long-term negative effects was identified for Common and Soprano pipistrelles, as well as Leisler's bat, due to the high levels of activity recorded within the Proposed Wind Farm site and their classification as high-risk species. The potential unmitigated effects on these high-risk species as a result of their potential interaction with wind turbines are **considered significant at a local geographic scale**. No significant effects are anticipated at any other geographic scale.
Mitigation	**Bat Buffer** In accordance with NatureScot and NIEA Guidance, a minimum 50m buffer to all habitat features used by bats (e.g., hedgerows, tree lines etc.). A full description of the mitigation measures proposed during operational phase are described in Section 6.1 of the Bat Report. Details of this mitigation and how it is calculated is provided in Appendix 6-2. **Blade Feathering:** On a precautionary basis, and in addition to buffers applied to habitat features, it is proposed that all wind turbines are subject to 'feathering' of turbine blades when wind speeds are below the cut-in speed of the proposed turbine. This means that the turbine blades are pitched at 90 degrees or parallel to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021). **Bat Mitigation and Monitoring Plan:** Full details of the proposed operational bat monitoring programme for the Proposed Project are provided in Section 6.2.1 of the Bat Report (Appendix 6-2). The post-construction surveys will be carried out as per the pre-construction survey effort. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision. Static monitoring shall take place at each turbine during the bat activity season (between April and October) (NatureScot, 2021, NIEA, 2021). Carcass searches, to monitor and record bat fatalities, shall be conducted at each turbine in accordance with NIEA Guidance. This shall include searcher efficiency trials and an assessment of scavenger removal rates to determine the appropriate correction factor to be applied in relation to determining an accurate estimate of collision mortality. Monitoring surveys shall continue in Year 2 and 3, and where a curtailment requirement has been identified, the success of the curtailment strategy shall be assessed in line with the baseline data collected in the preceding year(s). **Lighting:**

	With regard to the potential for lighting to increase collision risk, it is noted that there will be limited illumination of the turbines in the form of aviation lighting. Post construction monitoring will be carried out (as outlined below) to assess any potential changes in bat activity patterns and collision risk. The proposed lighting around the Proposed Wind Farm shall be designed with consideration of the Institute of Lighting Professionals Guidance Note 08/23 Bats and Artificial Lighting at Night (ILP, 2023). Significant effects as a result of lighting are not anticipated; however, if in the course of this monitoring, any potential for significant effects on bats is identified, the site-specific mitigation measures will be reviewed and any changes necessary will be implemented to avoid any such impacts.
Residual Effect following Mitigation	Taking into consideration the sensitive design of the Proposed Development, the proposed best practice and adaptive mitigation measures, significant residual effects on bats as a result of collision and barotrauma are not anticipated.

6.5.4 Likely Significant Effects During Decommissioning phase

Decommissioning is fully described in Chapter 4 (Section 4.10). There will be no additional habitat loss associated with the decommissioning of the Proposed Development and therefore there will be no significant effects in this regard.

Following the end of the operational life of the wind farm, the wind turbines may be retained and the operational life extended or replaced with a new set of turbines, subject to planning permission being obtained. In the event that neither of the above options are implemented, the Proposed Development will be decommissioned fully as agreed with the Planning Authority. The onsite substation will remain in place as it will be under the ownership of the ESB and will form a permanent part of the national electricity grid.

Upon decommissioning of the Seskin Renewables Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected. The turbines will be disassembled with a similar model of crane that was used for their erection. The turbine will likely be removed from site using the same transport methodology adopted for delivery to site initially. The turbine materials will be transferred to a suitable recycling or recovery facility.

The underground electrical cabling connecting the turbines to the on-site substation will be removed from the cable ducts. The cabling will be pulled from the cable ducts using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at the original cable jointing pits which will be excavated using a mechanical excavator and will be fully re-instated once the cables are removed. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance. The cable materials will be transferred to a suitable recycling or recovery facility.

All above ground turbine components would be separated and removed off-site for recycling. Turbine foundations would remain in place underground and would be covered with earth and reseeded as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in unnecessary environment emissions such as noise, dust and/or vibration.

Site roadways could be in use for purposes other than the operation of the Proposed Development by the time the decommissioning of the Proposed Development is to be considered, and therefore it may be more appropriate to leave the Site roads in situ for future use. It is envisaged that the roads will provide a useful means of transport as agricultural roads for the pastoral farming on the Site.

The underground grid connection cabling and on-site substation will remain in place as it will be under the ownership and control of the ESB and Eirgrid.

A Decommissioning Plan has been prepared and included as Appendix 4-5 of this EIAR, which will be agreed with the local authority prior to any decommissioning. The plan provides details of the methodologies that will be adopted, throughout decommissioning, the environmental controls that will be implemented, the Emergency Response Procedure to be adopted, methods for reviewing compliance and an indicative programme of decommissioning works.

The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will agreed with the competent authority at that time. The potential for effects during the decommissioning phase of the proposed renewable energy development have been assessed in this EIAR.

As noted in the Scottish Natural Heritage report (SNH) Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms (SNH, 2013) reinstatement proposals for a wind farm are made approximately 30 years in advance, so within the lifespan of the wind farm, technological advances and preferred approaches to reinstatement are likely to change. According to the SNH guidance, it is therefore:

"best practice not to limit options too far in advance of actual decommissioning but to maintain informed flexibility until close to the end-of-life of the wind farm".

6.5.5 Effects on Designated Sites

6.5.5.1 European Designated Sites

The Proposed Wind Farm is located completely outside of the boundary of any European site. The Proposed Grid Connection Route runs adjacent and under to the River Barrow and River Nore SAC, while watercourses within the Proposed Wind Farm site have a direct hydrological link to the River Barrow and River Nore SAC. A potential for likely significant effect was therefore identified on the following European site:

- River Barrow and River Nore SAC
- River Nore SPA

In relation to European sites, an Appropriate Assessment Screening Report and Natura Impact Statement (NIS) have been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment for the Proposed Development in compliance with Article 6(3) of the Habitats Directive.

As per the EPA Guidance (2022), *"A biodiversity section of an EIAR, for example, should not repeat the detailed assessment of potential effects on European sites contained in documentation prepared as part of the Appropriate Assessment process, but it should refer to the findings of that separate assessment in the context of likely significant effects on the environment, as required by the EIA Directive"*. This section provides a summary of the key assessment findings with regard to potential impacts on European sites. *

The Stage 1 Screening Assessment concluded as follows:

'It cannot be excluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the Proposed Development, individually or in combination with other plans and projects, would be likely to have a significant effect on the following European Sites:

- *River Barrow and River Nore SAC*
- *River Nore SPA*

As a result, an Appropriate Assessment is required and a Natura Impact Statement shall be prepared in respect of the Proposed Development.'

The findings presented in the NIS are that:

'Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction and operation of the Proposed Development does not adversely affect the integrity of European sites.

Therefore, it can be objectively concluded that the Proposed Development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site'.

6.5.5.2 Nationally Designated Sites

The following pNHA was identified to be within the Likely Zone of Influence of the Proposed Development:

- River Nore / Abbeyleix Woods Complex pNHA [002076]

River Nore / Abbeyleix Woods Complex pNHA is known to support a large population of the internationally important species freshwater pearl mussel (*Margaritifera margaritifera*). The river Nore is also important spawning area for twaite shad (*Alosa fallax*). A potential pathway for impact on these species via pollution to surface waters during construction of the Proposed Grid Connection was identified. Freshwater pearl mussel were not detected within any of the watercourses during the aquatic surveys (See Aquatic report included in Appendix 6-3). However, mitigation measures will be implemented which will ensure that water quality within the River Nore will be protected during all phases of the Proposed works. These mitigations are outlined in Sections 9.4.2.1 (earthworks), 9.4.2.5 (surface water), 9.4.2.6 (hydrocarbons), 9.4.2.7 (wastewater), 9.4.2.8 (cement-based products), 9.4.2.9 and 9.4.2.10 (morphological changes) and 9.4.3.2 (designated sites).

6.6 Cumulative Impact

The Proposed Development was considered in combination with other plans and projects in the area that could result in cumulative impacts on the KERs identified in Section 6.5.3 of this report, including European Designated Sites and Nationally Designated Sites. This included a review of online Planning Registers and served to identify past, present and future plans and projects, their activities and their predicted environmental effects. The projects considered are listed in Chapter 2: Background of the Proposed Development. The full list of projects has been considered and relevant ones from this list are discussed in this section.

6.6.1 Assessment of Plans

The following development plans have been reviewed and taken into consideration as part of this assessment:

- Laois County Council Development Plan 2021 - 2027
- Kilkenny City and County Development Plan 2021-2027
- 4th National Biodiversity Action Plan 2023-2027
- Regional Spatial and Economic Strategy for the Southern Region (2020-2032)

The review focused on policies and objectives that relate to designated sites for nature conservation, biodiversity and protected species. Policies and objectives relating to the conservation of Annex I habitats were also reviewed. An overview of the search results with regard to plans is provided in Table 6-21.

Potential for cumulative impacts on European sites are considered within the Natura Impact Statement that accompanies this application.

Table 6-21: Assessment of Plans

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of Proposed Development compliance with policy
Laois County Council Development Plan 2021-2027	**Policy Objectives for Biodiversity and Designated Sites** **BNH 1:** Protect, conserve, and seek to enhance the county's biodiversity and ecological connectivity. **BNH 2:** Conserve and protect habitats and species listed in the Annexes of the EU Habitats Directive (92/43/EEC) (as amended) and the Birds Directive (2009/147/EC), the Wildlife Acts 1976 and 2010 (as amended) and the Flora Protection Orders. **BNH 3:** Support and co-operate with statutory authorities and others in support of measures taken to manage proposed or designated sites in order to achieve their conservation objectives and maintain the favourable conservation status and conservation value of Sites under National and European legislation and International Agreements and maintain and /develop linkages between them where feasible. **BNH 4:** Protect and maintain the conservation value of all existing and future Natural Heritage Areas, Nature Reserves, Ramsar Sites, Wildfowl Sanctuaries and Biogenetic Reserves in the county. **BNH 5:** Projects giving rise to significant cumulative, direct, indirect or secondary impacts on Natura 2000 sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall not be permitted on the basis of this Plan (either individually or in combination with other plans or projects)[1]. Screening for AAs and AAs undertaken shall take into account invasive species as relevant. **BNH 6:** Assess, in accordance with the relevant legislation, all proposed developments which are likely to have a significant effect (directly or through indirect or cumulative impact) on designated natural heritage sites, sites proposed for designation and protected species.	The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the biodiversity, protected species and designated sites. The overall aim of the policies and objectives set out in the County Development plan in relation to Biodiversity aim to protect and enhance biodiversity within the county. No potential for negative cumulative impacts were identified when considered in conjunction with the Proposed Development. No developments or projects identified within the Development Plan were found to occur in the wider area surrounding the Proposed Development. The BMEP for the Proposed Development aims to implement and align with Green Infrastructure policies outlined in the Laois County Development Plan by enhancing biodiversity within the Proposed Wind Farm site, in particular through providing an overall net gain in linear habitats throughout the Proposed Wind Farm site. The AA Screening for the Laois County Development Plan identified potential for likely significant effects on the following SACs and SPAs: › Slieve Bloom Mountains SAC › Cullahill Mountain SAC › Clonaslee Eskers and Derry Bog SAC › Lisbigney Bog SAC › Mountmellick SAC › River Barrow and River Nore SAC

	BNH 7: Protect Natural Heritage Areas (NHA) from developments that would adversely affect their special interests. **BNH 8:** Recognise and protect the significant geological value of sites in County Laois and safeguard these sites, in consultation with the Geological Survey of Ireland and in accordance with the National Heritage Plan and "Geological Heritage Guidelines for the Extractive Industry". **BNH 10:** Support the objectives of the All Ireland Pollinator Plan 2015-2020 by encouraging the planting of pollinator friendly trees and plants within grassverges along public roads and existing and future greenways, new hedgerows, public parks and public open spaces in towns and villages, including part of mixed use and residential developments.	› Ballyprior Grassland SAC › Coolrain Bog SAC › Knockcoller Bog SAC › Galmoy fen SAC › Slieve Bloom Mountains SPA › River Nore SPA As such the potential for cumulative impacts were identified in-combination with the Proposed Development specifically in relation to the River Barrow and River Nore SAC. However, with the implementation of mitigation measures outlined within this Biodiversity Chapter and the NIS for the Proposed Development and the mitigation measures outlined within the NIS[21] for the Laois County Development plan **no potential for significant in-combination effects are identified.**
	Green Infrastructure - Policies **It is the policy of the Council to:** **BNH 19:** Ensure that areas and networks of Green Infrastructure are identified, protected, enhanced, managed and created to provide a wide range of environmental, social and economic benefits to communities. **BNH 20:** Develop and implement a Green Infrastructure Strategy for Laois in partnership with key stakeholders and the public which reflects a long-term perspective, including the need to adapt to climate change. Ensure the Green Infrastructure Strategy for Laois protects existing Green Infrastructure resources and plans for future Green Infrastructure provision. **BNH 23:** Encourage, pursuant to Article 10 of the Habitats Directive, the management of features of the landscape, such as traditional field boundaries and laneways, important for the ecological coherence of the Natura 2000	

[21] https://consult.carlow.ie/ga/consultation/draft-carlow-county-development-plan-2022-2028/chapter/ii-natura-impact-report-support-appropriate-assessment

	network and essential for the migration, dispersal and genetic exchange of wild species. **BNH 24:** To identify and map Green Infrastructure assets and sites of local biodiversity value over the lifetime of the Plan. **DM BNH 3:** Require all proposals for large scale development such as road or drainage schemes, wind farms, housing estates, industrial parks or shopping centres to submit a Green Infrastructure Plan as an integral part of a planning application.	
	Policy Objectives for Trees, Woodlands, and Hedgerows **BNH 27:** Protect existing hedgerows, particularly of historical and archaeological importance of townland boundaries, from unnecessary removal in order to preserve the rural character of the countryside ad promote biodiversity. **BNH 28:** Ensure that hedgerow removal to facilitate development is kept to an absolute minimum and, where unavoidable, a requirement for mitigation planting will be required comprising a hedge of similar length and species composition to the original, established as close as is practicable to the original and where possible linking in to existing adjacent hedges. Native plants of a local provenance should be used for any such planting. **BNH 30:** Ensure that hedgerow and mature tree removal to facilitate development is kept to an absolute minimum and, where unavoidable, a requirement for mitigation planting will be required comprising a hedge of similar length and species composition to the original, established as close as is practicable to the original and where possible linking in to existing adjacent hedges. Native plants of a local provenance should be used for any such planting. **DM BNH 5: Hedgerows**	

	In dealing with applications for new developments, the Planning Authority will have regard to the following: a) Retention of a connected network of good quality hedgerows; b) The value of hedgerows as green infrastructure (landscape,biodiversity, shelter, supporting services to agriculture/horticulture; c) The avoidance of the unnecessary removal of hedgerows; d) If it is necessary to remove a hedgerow, developers should be reminded of their obligations under the Wildlife Acts not to remove or interfere with them during the bird nesting season, between March 1st and 31st August. Also, replacement or compensatory planting of hedgerows using indigenous species such as whitethorn or blackthorn only will be required; e) Proposals to integrate hedgerows into the layout of a new linear feature such as a road/ pedestrian/cycle track; f) Depending on the potential risks of anti-social activity or requirements for a more garden look the margins of these new hedgerows/woodlands/new shrubberies could be planted with colourful non natives (for amenity) or spiny shrubs to deter vandals. g) By occasionally mowing the grass margin of hedgerows (or part of it), they will look managed. As litter will accumulate in long grass along their margins arrangements will have to be made to carry outregular clean ups; h) Encouragement should be given to develop a new linear feature of biodiversity value such as a hedgerow or dry stone wall,particularly if this type of habitat is found adjacent to the development site; i) The use of native tree and shrub species similar to those found in adjacent hedgerows in new or replacement hedgerows; j) The wholesale removal of hedgerows to facilitate the achievement of adequate sightline visibility for one-off houses in the countryside will not be encouraged.	

	Policy Objectives for Waterways and Wetlands: **BNH 37:** Protect the Nore Pearl Mussel through the measures set out in the Freshwater Pearl Mussel Nore Sub-Basin Management Plan (2009).	
Kilkenny City and County Development Plan 2021-2027	**It is the Policy of the Council to**: **Objective 1A:** To implement the provisions of Articles 6(3) and 6(4) of the EU Habitats Directive and ensure that any plan or project within the functional area of the Planning Authority is subject to appropriate assessment in accordance with the Guidance Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities, 20091 or any subsequent version, and is assessed in accordance with Article 6 of the Habitats Directive in order to avoid adverse impacts on the integrity and conservation objectives of the site. **Objective 9A:** Continue to identify and map habitats and green infrastructure of county importance, and raise awareness and understanding of the county's natural heritage and biodiversity identifying green corridors and measures to connect them. - To ensure that development proposals, where relevant, improve the ecological coherence of the Natura 2000 network and encourage the retention and management of landscape features that are of major importance for wild fauna and flora as per Article 10 of the Habitats Directive. - To protect and where possible enhance wildlife habitats and landscape features which act as ecological corridors/networks and stepping stones, such as river corridors, hedgerows and road verges, and to minimise the loss of habitats and features of the wider countryside (such as ponds, wetlands, trees) which are not within designated sites.	The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the biodiversity, protected species and designated sites. The overall aim of the policies and objectives set out in the County Development plan in relation to Biodiversity aim to protect and enhance biodiversity within the county. The BMP for the Proposed Development aligns with Objective 9B of the County Development plan by enhancing the Proposed Development site for local biodiversity including linear habitats, such as hedgerows, bats, and otter. No potential for negative cumulative impacts were identified when considered in conjunction with the Proposed Development. No developments or projects identified within the Development Plan were found to occur in the wider area surrounding the Proposed Development. The AA Screening for the Kilkenny City and County Development Plan identified potential for likely significant effects on the following SACs and SPAs: › River Barrow and River Nore SAC › Hugginstown Fen SAC › The Loughans SAC › Cullahill Mountain SAC › Spahill and Clomantagh Hill SAC › Galmoy Fen SAC

	- To ensure that appropriate mitigation and/or compensation measures to conserve biodiversity, landscape character and green infrastructure networks are required in developments where habitats are at risk or lost as part of a development. **Objective 9B:** To identify and map green infrastructure assets and sites of local biodiversity value over the lifetime of the Plan. - Require all developments in the early pre-planning stage of the planning process to identify, protect and enhance ecological features and habitats, and making provision for local biodiversity (e.g. through protection of existing breeding sites, and provision of appropriate new infrastructure such as swift, bat and barn owl boxes, bat roost sites, green roofs, etc.) and provide links to the wider Green Infrastructure network as an essential part of the design process. **Objective 10B:** To implement the measures of the River Basin Management Plan, including continuing to work with communities through the Local Authority Waters Programmes to restore and improve water quality in the identified areas of action.	› Lower River Suir SAC › Thomastown Quarry SAC › River Nore SPA › Lisbigney Bog SAC As such the potential for cumulative impacts were identified in-combination with the Proposed Development specifically in relation to the River Barrow and River Nore SAC. However, with the implementation of mitigation measures outlined within this Biodiversity Chapter and the NIS for the Proposed Development and the mitigation measures outlined within the NIS[22] for the Kilkenny County Development plan **no potential for significant in-combination effects are identified.**
4th National Biodiversity Action Plan 2023-2027	Irelands 4th National Biodiversity Action Plan 2023-2030 (Department of Housing, Local Government and Heritage, 2024) (the "**NBAP**"). The NBAP strives for a "whole of government, whole of society" approach to the governance and conservation of biodiversity. It demonstrates Ireland's continuing commitment to meeting and acting on its obligations to protect Ireland's biodiversity for the benefit of future generations and will implement this through a number of key targets, actions and objectives. The Wildlife (Amendment) Act 2023 introduced a new public sector duty on biodiversity. The legislation provides that every public body, as listed in the Act, is obliged	The objectives set out in the NBAP aim to protect and enhance and promote biodiversity, nature restoration on the Island of Ireland and also contribute to International biodiversity initiative. Mitigation and enhancement measures as outlined in the EIAR and NIS for the Proposed Development also aim to protect and enhance biodiversity as such no cumulative impacts were identified upon review of the Plan in conjunction with the Proposed Development. The Proposed Development will not contravene the proposed outcomes of the NBAP.

[22] https://kilkennycoco.ie/eng/services/planning/development-plans/city-and-county-development-plan/adopted-city-and-county-development-plan.html

	to have regard to the objectives and targets in the NBAP. The NBAP sets out five key objectives as follows.	
	Objective 1: Adopt a Whole-of Government, Whole of-Society Approach to Biodiversity. Proposed actions include capacity and resource reviews across Government; determining responsibilities for the expanding biodiversity agenda providing support for communities, citizen scientists and business; and mechanisms for the governance and review of this National Biodiversity Action Plan.	
	Objective 2: Meet Urgent Conservation and Restoration Needs. Supporting actions will build on existing conservation measures. Efforts to tackle Invasive Alien Species will be elevated. The protected area network will be expanded to include the Marine Protected Areas. The ambition of the EU Biodiversity Strategy will be considered as part of an evolving work programme across Government.	
	Objective 3: Secure Nature's Contribution to People. Actions highlight the relationship between nature and people in Ireland. These include recognising the tangible and intangible values of biodiversity, promoting nature's importance to our culture and heritage and recognising how biodiversity supports our society and our economy.	
	Objective 4: Enhance the Evidence Base for Action on Biodiversity. This objective focuses on biodiversity research needs, as well as the development and strengthening of long-term monitoring programmes that will underpin and strengthen future decision-making. Action will also focus on collaboration to advance ecosystem accounting that will contribute towards natural capital accounts.	
	Objective 5: Strengthen Ireland's Contribution to International Biodiversity Initiatives. Collaboration with other countries and across the island of Ireland will play a key role in the realisation of this Objective. Ireland will strengthen its contribution to international biodiversity initiatives and international governance processes, such as the United Nations Convention on Biological Diversity.	

Regional Spatial and Economic Strategy for the Southern Region (2020-2032)	**RPO 1.b.** The RSES seeks to protect, manage, and through enhanced ecological connectivity, improve the coherence of the Natura 2000 Network in the Southern Region. **RPO 5. Population Growth and Environmental Criteria Increased population growth should be planned with regard to environmental criteria, including:** › Assimilative capacity of the receiving environment; › Proximity of Natura 2000 sites and potential for adverse effects on these sites, and their conservation objectives; › Areas with flood potential. **RPO 117 Flood Risk Management and Biodiversity** It is an objective to avail of opportunities to enhance biodiversity and amenity and to ensure the protection of environmentally sensitive sites and habitats, including where flood risk management measures are planned. Plans and projects that have the potential to negatively impact on Natura 2000 sites are subject to the requirements of the Habitats Directive **RPO 124 Green Infrastructure** a. It is an objective to promote the concept of connecting corridors for the movement of wildlife and encourage the retention and creation of features of biodiversity value, ecological corridors and networks that connect areas of high conservation value such as woodlands, hedgerows, earth banks, watercourses and wetlands. The RSES recognises the necessity of protecting such corridors and the necessity to encourage the management of features of the landscape that support the Natura 2000 network;	The Regional Spatial and Economic Strategy for the Southern Region was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the Natura 2000 network and other natural heritage interests. No potential for cumulative effects when considered in conjunction with the current proposed development were identified.

	b. Green infrastructure will be integrated into the preparation of statutory land-use plans in the Region, which will include identifying Green infrastructure and strengthening this network; c. All Development Plans and Local Area Plans shall protect, enhance, provide and manage Green infrastructure in an integrated and coherent manner addressing the themes of biodiversity protection, water management and climate action; and should also have regard to the required targets in relation to the conservation of European sites, other nature conservation sites, ecological networks, and protected species; d. Any future development of greenways, blueways, peatways, cycleways or walkways will include an assessment by the relevant authorities of any impacts that may arise from increased visitor pressures, in particular, on sensitive European sites and the design of the network will consider the provision of protective measures on sites sensitive to disturbance/visitor pressure.	

6.6.2 Assessment of Projects

As described in Section 2.9 of the EIAR, relevant projects have been assessed in-combination with the Proposed Development and include planning applications in the vicinity of the Proposed Development site, within the zone of influence of all habitats and species considered in this report, and include other wind energy applications within the wider area. These have not been repeated here to reduce the duplication of information within this EIAR. However, they have been fully considered in the assessment with further detail provided below. In addition, Section 6.6.3 concludes on their potential for impact on biodiversity.

Other smaller developments within the wider study area, as fully described in Section 2.4.1 of this EIAR, have been considered within this cumulative impact assessment. In order to avoid repetition within the EIAR, these have not been repeated below.

The table below provides the cumulative study areas for individual EIAR topics that are also relevant in relation to ecological receptors i.e., hydrological connectivity is important for assessing potential for effects on designated sites. Potential for cumulative effects in relation to birds is assessed separately within Chapter 7 of this EIAR.

Table 6-22: Cumulative Study Areas in relation to ecological receptors (birds are assessed separately within Chapter 7 of this EIAR)

Individual Topic	Maximum Extent	Justification
Biodiversity (including Bats)	10 km from the Proposed Wind Farm 200 m from Proposed Grid Connection Route. Consideration for the Biodiversity cumulative extent is also given to the Birds and Water Cumulative geographical boundaries.	Using the precautionary approach and given the nature and scale of the Proposed Development, the geographical boundary for terrestrial ecological aspects, i.e. habitats, is 10 km for cumulative assessment for the Proposed Wind Farm and 200 m from the Proposed Grid Connection Route.
Water	**Proposed Wind Farm:** Nore Catchment for large infrastructural developments such as wind farms, energy and public transport developments. River Sub Basins for all smaller proposed, permitted or existing plans or projects (i.e. private and commercial type developments). **Proposed Grid Connection Route:**	Regional surface water catchments are used for cumulative impact assessment with regard large infrastructural developments such as wind farms, energy and public transport developments. The potential for cumulative effects for these developments likely exists on a regional catchment scale (i.e. significant works likely existing in several sub-basins). Therefore, other wind-farm developments are considered within the Shannon Catchment for cumulative effects. River Sub Basins are used for smaller developments (i.e. private & commercial type developments). These developments

	Within a 200m buffer zone of the Proposed Grid Connection Route.	are not likely to present a significant cumulative impact risk on a regional catchment scale as any effects would likely be imperceptible as a result of the setback distances and localised nature of the associated works. Given the nature and scale of the proposed works and the lack of hydrological cumulative impact potential beyond the river sub basin scale, the Water cumulative study area is defined by river sub basins in which the Proposed Wind Farm is located. Due to the narrow nature of the Proposed Grid Connection Route trench (~0.6m wide), a 200m buffer zone is an appropriate scale when considering potential cumulative effects on the water environment.

6.6.2.1 Proposed Grid Connection

A desk-based planning search was undertaken to identify permitted developments within 200m vicinity of the Proposed Grid Connection Route. The projects within this boundary are described in Appendix 2-3 and are not repeated in detail here. Generally, the projects identified within this area consisted of the construction of individual private dwellings, extensions to existing dwellings, as well as agricultural, energy and telecoms developments. Such projects include a cable connection for Ballyragget and Parksgrove Solar PV Farms, a wind farm development at Ballynalacken and a renewable energy development at Bricksalagh. The Biodiversity Chapter's and NIS's for these projects were reviewed. Potential for in-combination effects in relation to European sites are fully assessed in Section 8 in the NIS accompanying this application. The Biodiversity Chapters for these projects all contain mitigations to prevent identified impacts to biodiversity. No additional pathways for cumulative effects were identified in conjunction with the Proposed Project. With the implementation of mitigation measures proposed as part of the above-mentioned projects and the Proposed Project no potential for cumulative impacts were identified.

6.6.2.2 Other Wind Farm Projects

For the purposes of this cumulative assessment, wind farms within a 10-kilometre radius of the Proposed Development area were considered in further detail below. Wind farm projects >10km from the Proposed Development area were considered where a hydrological connection, or other source-pathway-receptor connection, was evident and the project was deemed to be relevant to this assessment. Wind farms identified as being within the cumulative study boundary, in the context of terrestrial ecology, are outlined in Table 6-23 below. Potential for in-combination effects in relation to European sites are fully assessed in Section 8 in the NIS accompanying this application.

Table 6-23: Wind Farm developments considered to be within the cumulative study area (Biodiversity) of the Proposed Development

Wind Farm	Planning Status	Number of Turbines	Separation Distance (turbine to turbine)	County
Lisdowney Wind Farm	Existing	4	c.4.1km	Co. Kilkenny
Ballynalacken Wind Farm	Proposed	12	c.5.6km	Co. Kilkenny
Pinewoods Wind Farm	Permitted	11	c.9.9km	Co. Laois/ Co. Kilkenny

6.6.2.3 Lisdowney Wind Farm

Lisdowney Wind Farm is an existing wind farm consisting of 4 no. turbines and is approx. 4.1km from the Proposed Development site. Given the lack of residual effects predicted as a result of the Proposed Development, and in light of the fact that Lisdowney wind farm has already been constructed there is no potential for significant cumulative effects.

6.6.2.4 Ballynalacken Wind Farm

This wind farm consists of 11 no. turbines and is approx. 9.9km from the Proposed Development site. The site of the Ballynalacken Wind Farm and that of the Proposed Development are both hydrologically linked to the River Barrow and River Nore SAC and River Nore SPA. The potential for the Proposed Development to result in significant cumulative effects when assessed alongside Ballynalacken Wind Farm was considered. The conclusion of the Biodiversity Chapter for Ballynalacken Wind Farm was that the residual impact on biodiversity, as a result of the wind farm development would be neutral, s with the implementation of mitigation measures outlined in the report. Given the lack of residual effects predicted as a result of the Proposed Development, there is no potential for significant cumulative effects.

6.6.2.5 Pinewood Wind Farm

This wind farm consists of 11 no. turbines and is approx. 9.9km from the Proposed Development site. The potential for the Proposed Development to result in significant cumulative effects when assessed alongside Pinewood Wind Farm was considered. The conclusion of the Biodiversity Chapter for Pinewood Wind Farm was that there would be no residual significant effects on biodiversity with the implementation of mitigation measures outlined in the report. Given the lack of residual effects predicted as a result of the Proposed Development, there is no potential for significant cumulative effects.

6.6.2.6 Existing Habitats and Land Uses

The potential for the Proposed Development to result in a cumulative loss or deterioration of habitats, or impact on the KER species identified, was considered in relation to the existing land uses in the area.

The Proposed Development is located primarily within agricultural grassland bounded by hedgerows and treelines. The development will result in the loss of 1.8km of linear features (hedgerow/treelines) which have been shown to be utilised by a range of protected faunal species. The loss of linear habitats including treelines and hedgerow will be mitigated through the replanting and enhacement measures described in the BMEP (Appendix 6-4). The Proposed Development will not contribute to any loss of protected habitats and has been deliberately designed to be located on habitats of low value for faunal species (agricultural grassland).

The review of the relevant planning registers documented relevant general development planning applications in the vicinity of the site, the majority of which relate to the provision and/or alteration of one-off rural housing and the provision of agricultural buildings.

6.6.3 Overall Assessment of Cumulative Effects

The residual construction, operational and decommissioning impacts of the Proposed Development are considered cumulatively with other plans and projects as described in Sections 6.6.1, and 6.6.2. Particular focus has been placed on those plans and projects that are in closest proximity to the Proposed Development and those that could potentially result in cumulative impacts on designated sites, surface water, habitats and species. A cumulative impact assessment specific to the potential for impacts on bats is provided in Appendix 6-2 and summarised here also.

Following the detailed surveys undertaken and impact assessment provided in Section 6.5 (including mitigation measures), it is concluded that there will be no significant residual habitat loss, disturbance, deterioration of water quality associated with the Proposed Development and therefore it cannot contribute to any cumulative effect when considered in-combination with other plans and projects. The other wind farms in the area were considered (among other projects) but the Proposed Development has been deliberately designed to minimise the effects on biodiversity through the siting of the Proposed Wind Farm infrastructure on habitats of low ecological value where possible and an emphasis on protection of surface water features (and associated aquatic fauna) during construction of the Proposed Development. The Proposed Development also includes a Biodiversity Management Plan, which further minimises /mitigates any potential for individual or cumulative negative effects on biodiversity and proposes enhancement measures for habitats and species within the EIAR boundary.

No significant effects as a result of the Proposed Development in relation to disturbance, displacement or mortality of faunal species has been identified. Therefore, there is no potential for the Proposed Development to contribute to any cumulative effect in this regard.

The Proposed Development will not result in any significant residual effects on biodiversity and will not contribute to any cumulative effect when considered in combination with other plans and projects.

In the review of the projects and plans that was undertaken, no connection that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the Proposed Development.

6.7 Conclusion

With the implementation of mitigation measures as outlined in Sections 6.5.2-6.5.5 of the Biodiversity Chapter it can be concluded that the Proposed Development will not result in any significant residual

effects on any of the identified KERs in the long term. It has been concluded that there will be a temporary residual effect at the local geographic scale in the short to medium term (5-15 years) on linear features (hedgerows and treelines) and bats until newly planted/translocated hedgerows across the site have time to establish and mature.

The potential for effects on the European Designated sites is fully described in the NIS that accompanies this application. The NIS concluded that in view of best scientific knowledge and on the basis of objective information, the Proposed Development either individually or in-combination with other plans or projects, is not likely to have an adverse effect on the European sites that were assessed as part Appropriate Assessment process. Similarly, with the prescribed mitigations in place, there is no potential for impact on any nationally designated site.