

# Appropriate Assessment Screening Report and Natura Impact Statement

Carrow Wind Farm





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# Table of Contents

1.	<b>INTRODUCTION .....</b>	<b>4</b>
1.1	Background .....	4
1.2	References to Proposed Project .....	4
1.3	Statement of Authority .....	5
1.4	Methodology.....	7
1.4.1	Appropriate Assessment Process.....	7
1.4.2	Desk Study.....	7
1.4.3	Scoping and Consultation.....	8
1.4.4	Ecological Survey Methodologies .....	9
1.4.4.1	Ecological Multidisciplinary Walkover Surveys .....	10
1.4.4.2	Otter Survey .....	10
1.4.4.3	Aquatic Surveys.....	11
1.4.4.4	Invasive Species Survey.....	11
1.4.4.5	Bird Surveys.....	11
1.4.4.6	Other Fauna .....	14
1.5	Structure and Format of this Document .....	14
2.	<b>DESCRIPTION OF PROPOSED PROJECT .....</b>	<b>16</b>
2.1	Site Location .....	16
2.2	Development Components of the Proposed Project.....	18
2.3	Detail on Development Components of the Proposed Wind Farm site .....	20
2.3.1	Wind Turbines.....	20
2.3.1.1	Turbine Locations.....	20
2.3.1.2	Turbine Type.....	21
2.3.1.3	Turbine Foundations.....	21
2.3.1.4	Hardstanding Areas.....	22
2.3.1.5	Assembly Area.....	22
2.3.1.6	Power Output.....	22
2.3.2	Site Roads.....	23
2.3.2.1	Road Construction Types.....	23
2.3.3	Site Underground Electrical and Communications Cabling.....	24
2.3.4	Meteorological Mast.....	25
2.3.5	Temporary Construction Compounds.....	25
2.3.6	Biodiversity Enhancement and Management Plan.....	25
2.3.7	Tree Felling.....	26
2.3.7.1	Forestry Replanting.....	26
2.3.8	Borrow Pit.....	26
2.3.8.1	Spoil Management Plan.....	27
2.4	Detail on Development Components of the Proposed Grid Connection .....	28
2.4.1	Onsite 110kV Substation .....	28
2.4.2	Wind Farm Control Building.....	28
2.4.3	Battery Storage .....	29
2.4.4	Underground Grid Connection Cabling Route .....	29
2.4.4.1	Joint Bays.....	30
2.4.4.2	Watercourse and Service Crossings.....	31
2.4.4.3	Underground Grid Connection Cabling Construction Methodologies.....	31
2.5	Access and Transportation .....	32
2.5.1	Site Entrances.....	32
2.5.2	Turbine Delivery Route .....	33
3.	<b>CHARACTERISTICS OF THE RECEIVING ENVIRONMENT .....</b>	<b>34</b>
3.1	Hydrology.....	34
3.1.1	Regional and Local Hydrology.....	34
3.2	Results of Baseline Ecological Surveys .....	36
3.2.1	Descriptions of Habitats and Flora within the Proposed Wind Farm site.....	36
3.2.2	Habitats and Flora along the Proposed Grid Connection Route.....	49

3.2.3	Habitats and Flora along Turbine Delivery Route.....	51
3.2.4	Otter Surveys .....	52
3.2.5	Aquatic Surveys.....	52
3.2.6	Invasive Species.....	53
3.2.7	Bird Surveys.....	53
4.	<b>STAGE 1 - APPROPRIATE ASSESSMENT SCREENING .....</b>	<b>55</b>
4.1	Identification of Relevant European Sites.....	55
4.2	Appropriate Assessment Screening Conclusion .....	69
5.	<b>STAGE 2 – NATURA IMPACT STATEMENT (NIS) .....</b>	<b>70</b>
5.1	Identification of relevant Qualifying Features and Desk Study .....	71
5.1.1	Lower River Suir SAC (002137).....	71
5.1.1.1	Identification of Individual Qualifying Features with the Potential to be Affected .....	72
5.1.1.2	Site Specific Pressures and Threats.....	77
5.1.1.3	Habitat Specific Information.....	77
5.1.1.4	Species Specific Information.....	79
5.1.2	Lower River Shannon SAC (002165).....	87
5.1.2.1	Identification of Individual Qualifying Features with the Potential to be Affected .....	88
5.1.2.2	Site Specific Pressures and Threats.....	96
5.1.2.3	Habitat Specific Information.....	96
5.1.2.4	Species Specific Information.....	102
5.1.3	Philipston Marsh SAC (001847).....	107
5.1.3.1	Identification of Individual Qualifying Features with the Potential to be Affected .....	108
5.1.3.2	Site Specific Pressures and Threats.....	109
5.1.3.3	Habitat Specific Information.....	109
5.1.4	Slievefelim to Silvermines Mountains SPA (004165).....	111
5.1.4.1	Identification of Individual Qualifying Features with the Potential to be Affected .....	112
5.1.4.2	Site Specific Pressures and Threats.....	113
5.1.5	River Shannon and River Fergus Estuaries SPA (004077).....	114
5.1.5.1	Identification of Individual Qualifying Features with the Potential to be Affected .....	115
5.1.5.2	Site Specific Pressures and Threats.....	119
5.1.5.3	Special Conservation Interests' Specific Information.....	119
6.	<b>ASSESSMENT OF POTENTIAL EFFECTS &amp; ASSOCIATED MITIGATION .....</b>	<b>135</b>
6.1	Potential for Direct Effects on the European Sites .....	135
6.1.1	Disturbance/Displacement .....	135
6.1.1.1	Construction Phase.....	135
6.1.1.2	Operational Phase.....	137
6.1.1.3	Decommissioning Phase.....	137
6.2	Potential for Indirect Effects on European Sites .....	138
6.2.1	Deterioration of Surface Water Quality .....	138
6.2.1.2	Construction Phase.....	139
6.2.1.3	Operational Phase.....	152
6.2.1.4	Decommissioning Phase.....	153
6.2.2	Invasive Species.....	154
6.2.2.1	Construction Phase.....	155
6.2.2.2	Operational Phase.....	155
7.	<b>ASSESSMENT OF RESIDUAL ADVERSE EFFECTS .....</b>	<b>156</b>
8.	<b>ASSESSMENT OF CUMULATIVE EFFECTS .....</b>	<b>157</b>
8.1	Plans.....	157
8.2	Assessment of Projects.....	157
8.2.1	Other Projects within the Hydrological Sub-catchment .....	158
8.2.2	Proposed Grid Connection Route.....	159
8.2.3	Other Wind Farm Projects.....	160
8.3	Conclusion of Assessment of Cumulative Effects .....	168
9.	<b>CONCLUDING STATEMENT .....</b>	<b>169</b>
	<b>BIBLIOGRAPHY .....</b>	<b>170</b>

## TABLE OF FIGURES

<i>Figure 2-1 Site Location Map</i> .....	17
<i>Figure 2-2 Proposed Wind Farm Layout</i> .....	19
<i>Figure 3-1 Regional and Local Hydrology</i> .....	35
<i>Figure 4-1 European Designated Sites</i> .....	56

## APPENDICES

<b>Appendix 1:</b> .....	Bird Survey Effort
<b>Appendix 2:</b> .....	Aquatic Report
<b>Appendix 3:</b> .....	Detailed Site Layout Drawings
<b>Appendix 4:</b> .....	Invasive Species Management Plan (ISMP)
<b>Appendix 5:</b> .....	Review of Plans and Projects
<b>Appendix 6:</b> .....	Construction and Environmental Management Plan (CEMP)
<b>Appendix 7:</b> .....	Drainage Design Drawings

# 1. INTRODUCTION

## 1.1 Background

MKO has been appointed by Carrow Renewable Energy Ltd. to provide the information necessary to allow the competent authority to conduct an Article 6(3) Appropriate Assessment for the construction of a proposed 14-Turbine Wind Farm Development and Proposed Grid Connection in Carrow and adjacent townlands, near the villages of Dundrum and Hollyford, Co. Tipperary.

Screening for Appropriate Assessment is required under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). Where it cannot be excluded that a project or plan, either alone or in combination with other projects or plans, would have a significant effect on a European Site then same shall be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives. The current project is not directly connected with, or necessary for, the management of any European Site. Consequently, the project has been subject to the Appropriate Assessment Screening process.

This Appropriate Assessment Screening Report (AASR) and Natura Impact Statement (NIS) has been prepared in accordance with:

- › European Commission's Assessment of Plans and Projects Significantly affecting Natura 2000 Sites.
- › Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC (EC, 2021);
- › Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2018);
- › Department of the Environment's Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DoEHLG, 2010); and
- › Appropriate Assessment Screening for Development Management. Office of the Planning Regulator, Dublin 7, Ireland OPR (2021).

## 1.2 References to Proposed Project

The Proposed Project will be known as the 'Carrow Wind Farm'.

Section 1.1.1 of Chapter 1: Introduction, of the accompanying EIAR, provides a definition of the various project references. This report uses the same references. These project references are defined below;

- › Where the 'Proposed Project' is referred to this encompasses the entirety of the project for the purposes of this NIS in accordance with the EIA Directive. The Proposed Project is described in detail in Section 2.2 of this NIS.
- › Where the 'Proposed Wind Farm' is referred to, this refers to turbines and associated foundations and hardstanding areas, including entrances and access roads, underground cabling, permanent meteorological mast, temporary construction compounds, turbine delivery accommodation works, spoil repository areas, borrow pits, tree felling, site drainage, operational stage signage, battery energy storage system and all ancillary works and apparatus. The Proposed Wind Farm is described in detail in Section 2.2 of this NIS.
- › Where the 'Proposed Grid Connection Route' is referred to, this refers to the 110kV onsite substation, all ancillary works and underground 110kV grid connection cabling connecting to the existing Killonan 110kV substation Co. Limerick, and all ancillary works and apparatus. The Grid Connection Route is described in detail in Section 2.2 of this NIS.

- › Where the ‘Site’ is referred to, this relates to the primary study area for the purposes of Appropriate Assessment as delineated in green in Figure 2-1 and encompasses an area of approximately 1,564 hectares.
- › Where the ‘Wind Farm site’ is referred to, this relates to the EIAR Site Boundary without the corridor that encompasses the underground grid connection cabling route.

This report assesses the same boundary as the accompanying EIAR i.e. the EIAR Site Boundary and takes into account the combined impacts of these individual elements of the Proposed Project.

## 1.3 Statement of Authority

This AASR/NIS was prepared by Stephanie Corkery (B.Sc., M.Sc.) and Deepali Mooloo (B.Sc., M.Sc.) and reviewed by Pádraig Desmond (B.Sc.) and Caroline Kelly (B.Sc., MSc., MCIEEM).

Multidisciplinary ecological walkover surveys were carried out in 2024 and 2025 by MKO Ecologists Pádraig Desmond, Stephanie Corkery, Deepali Mooloo, Nora Szijarto (B.Sc., M.Sc.), David Culleton (B.Sc., M.Sc.), Ciara Hackett (B.Sc.), Mairead Kavannah (B.Sc., M.Sc.), Sara Fissolo (B.Sc.), and Molly O’ Hare (B.Sc., MSc.).

Dedicated aquatic surveys were carried out in 2024 by Aran von der Geest Moroney (B.Sc.), Niamh Rowan (B.Sc.) and Kieran Sugrue (B.Sc.) of MKO. Bat surveys were conducted in 2023 and 2024 by MKO ecologists Kate Greaney (MSc.), Ryan Connors (MSc.), Keith Costello (B.Sc.), Sara Fissolo (B.Sc.) and Frederick Mosely (MSc.) of MKO. The Grid Connection Route was visited by David Culleton, Mairead Kavannah, and Clare Mifsud (Ph.D.).

All surveyors have relevant academic qualifications and are competent in undertaking habitat and ecological assessments.

### **Caroline Kelly**

Caroline is a Senior Ecologist with MKO with over ten years’ experience in ecological consultancy and is a Full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Caroline holds a BSc in Environmental Biology from University College Dublin (UCD) and an MSc in Applied Ecological Assessment from University College Cork (UCC). In addition, Caroline has completed an Advanced Diploma in Planning and Environmental Law from Kings Inns Dublin. Prior to taking up her position with MKO in June 2025, Caroline worked as a Principal Ecologist with Scott Cawley Ltd. Caroline has strong generalist field ecology skills and has undertaken a range of ecological surveys including habitat, bird (both breeding and wintering), invasive species and protected fauna surveys. She has strong technical reporting skills and has extensive experience in a range of ecological assessments including Appropriate Assessment and Ecological Impact Assessment. She has undertaken ecological assessments and surveys on a variety of project types (e.g. linear infrastructure projects, industrial, commercial, residential, recreational, tourism and renewable energy developments).

### **Pádraig Desmond**

Pádraig is a Project Ecologist with MKO with five years post graduate ecological experience, four years of which have been in ecological consultancy. Pádraig holds a BSc (Hons) in Ecology and Environmental Biology from University College Cork. Pádraig took up his position with MKO in December 2021, prior to which he worked as a Junior Ecologist with Envirico. Through these consultancy roles Pádraig has gained excellent experience in producing ecological reports such as Natura Impact Statements, Ecological Impact Assessments, Biodiversity chapters, Invasive Species Management Plans, and Constraints Reports for a wide range of projects including small private developments to housing developments and renewable energy projects such as solar and wind farms. Prior to the above roles, Pádraig worked as a field ecologist for the Department of Conservation in New

Zealand, where he developed a strong field-based skill set. Pádraig's key strengths and areas of expertise are in terrestrial ecology, including vegetation surveys, habitat identification, invasive species surveys, mammal surveys, Appropriate Assessment and Ecological Impact Assessment. Pádraig is also skilled in GIS.

### **Stephanie Corkery**

Stephanie is an Ecologist with MKO with three and a half years of experience in professional ecological consultancy. Stephanie holds a BSc. in Ecology and Environmental Biology, an MSc. in Marine Biology, and a HDip in Sustainability in Enterprise, all from University College Cork. Since joining MKO as a graduate in March 2022, Stephanie has worked on a wide variety of projects including wind farms, large scale residential developments, and County Council projects. Stephanie's key strengths include organising and carrying out both terrestrial and marine mammal surveys, as well as general ecological walkover surveys and bat surveys. She is also experienced in GIS, acoustic data analysis for bat species, and in preparing Appropriate Assessment Screening Reports (AASR), Natura Impact Statements (NIS), Ecological Impact Assessments (EcIA), Biodiversity Chapters, and Bat Reports. Stephanie is also a JNCC Certified Marine Mammal Observer and has completed the ACCOBAMS Course for Highly Qualified Marine Mammal Observers (MMO) and Passive Acoustic Monitoring operators (PAM).

### **Deepali Mooloo**

Deepali Mooloo is an Ecologist at MKO, having joined the company in September 2023. She holds an M.Sc. (Hons) in Applied Coastal and Marine Management from University College Cork, where she specialized in spatial ecology, field skills, and drone photogrammetry. Deepali's expertise lies in ecology and field surveys, with experience in a range of multidisciplinary assessments. Since joining MKO, she has conducted walkover surveys, marsh fritillary surveys, mammal surveys, winter bird surveys, and botanical surveys, including detailed relevés of plant species in both coastal and terrestrial habitats. She is also skilled in habitat assessments, utilizing Fossitt's Guide to Habitats in Ireland and the ERICA database. Her professional experience includes preparing Appropriate Assessment Screening Reports (AASR), Feasibility Studies, Ecological Impact Assessments (EcIA), and Natura Impact Statements (NIS). She is proficient in detailed habitat and ecological constraints mapping using QGIS and has expertise in cartography using both QGIS and ArcGIS. In 2024, Deepali successfully completed the Marine Mammal Observer Course with IDWG. She also has prior experience working in coastal and marine environments in Mauritius.

## 1.4 Methodology

### 1.4.1 Appropriate Assessment Process

**Screening** - The purpose of the screening stage is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project, either alone or in combination with other plans or projects, is likely to have significant effects on a European site in view of the site's conservation objectives.

There is no necessity to establish such an effect; it is merely necessary for the competent authority to determine that there may be such an effect. The need to apply the precautionary principle in making any key decisions in relation to the tests of Appropriate Assessment has been confirmed by the case law of the Court of Justice of the European Union (CJEU). Plans or projects that have no appreciable effect on a European site may be excluded. The threshold at this first stage is a very low one and operates as a trigger in order to determine whether Appropriate Assessment of a project is required. Therefore, where significant effects are likely, uncertain or unknown at screening stage, an AA of the project will be required.

**Appropriate Assessment** - This stage of the process is a focused and detailed examination, analysis and evaluation by the competent authority of the implications of the plan or project, either alone or in combination with other plans and projects, on the integrity of a European site in view of that site's conservation objectives. Case law has established that such an Appropriate Assessment, to be lawfully conducted, must:

- i. identify, in the light of the best scientific knowledge in the field, all aspects of the proposed project which may, by itself or in-combination with other plans or projects, affect the conservation objectives of the European site;
- ii. contain complete, precise and definitive findings and conclusions and may not have lacunae or gaps; and
- iii. may only include a determination that the proposed project will not adversely affect the integrity of any relevant European site where the competent authority decides (on the basis of complete, precise and definitive findings and conclusions) that no reasonable scientific doubt remains as to the absence of potential adverse effects. If adverse impacts can be satisfactorily avoided or successfully mitigated at this stage, so that no reasonable doubt remains as to the absence of the identified potential effects, then the process is complete. If the assessment is negative, i.e. adverse effects on the integrity of a site cannot be excluded, then the process must proceed to stage three (assessment of alternative) and, if necessary, stage four (IROPI<sup>1</sup>).

### 1.4.2 Desk Study

The desk study undertaken for this assessment included a thorough review of the available ecological data associated with the European Sites within the Likely Zone of Influence of the Proposed Project location. Sources of data included the following:

- › Review of NPWS Conservation Objectives supporting documents, site synopsis, standard data forms and supporting documents for European Designated Sites,
- › Review of online web-mappers: National Parks and Wildlife Service (NPWS), Environmental Protection Agency (EPA)<sup>2</sup>,
- › Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper<sup>3</sup>,

<sup>1</sup> IROPI - 'imperative reasons of overriding public interest', the test found in Article 6(4) of the Habitats Directive.

<sup>2</sup> <https://gis.epa.ie/EPAMaps/> Accessed 23<sup>rd</sup> of October 2025

<sup>3</sup> <https://maps.biodiversityireland.ie/Map> Accessed 23<sup>rd</sup> of October 2025

- › Review of NPWS Article 17 metadata and GIS database<sup>4</sup>

### 1.4.3 Scoping and Consultation

MKO undertook a scoping exercise, as described in Chapter 2 of the accompanying EIAR.

Copies of all scoping responses are included in **Appendix 2-1** of the accompanying EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this report. Table 2-9 in Chapter 2 of the EIAR describes where the comments raised in the scoping responses received have been addressed in this assessment. Table 1-1 provides a list of the organisations consulted regarding biodiversity during the scoping process and notes where scoping responses were received.

In addition, MKO requested consultation with the National Parks and Wildlife Services (NPWS) to discuss the Proposed Project and to welcome any feedback they may have. This meeting was held online on the 12<sup>th</sup> of December 2025, where MKO presented an overview of the project to NPWS representatives, the surveys undertaken and the key findings, as well as European Site which are being considered in this report.

The key points of feedback are summarised below, with responses.

- › There was general concern about the efficacy of the proposed Biodiversity Enhancement and Management Plan (BEMP), regards implementation. In response, the BEMP has clearly stated that the responsibility of the full implementation of the measures and targets is with the client, who has legal agreements with landowners, and will be bound by any conditions of a granted permission of the project. It further notes that should any landowners pull out of any agreements, alternative landholdings in the vicinity of the Site will be sourced.
- › The NPWS noted a known breeding site for hen harrier in the vicinity of the Site. This has been addressed in Chapter 7.
- › In relation to this report, no concerns relating the screened in European Sites was noted.

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<sup>4</sup> <https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17-gis-and-metadata-downloads> Accessed 23rd of October 2025

Table 1-1 Organisations consulted regarding biodiversity.

Consultee	Scoping Response Date	Summary of Scoping Response
An Taisce	No response received	N/A
Bat Conservation Ireland	No response received	N/A
BirdWatch Ireland	No response received	N/A
Department of Agriculture, Food and the Marine	Response received on 30 <sup>th</sup> July 2024 and 22 <sup>nd</sup> November 2024.	No comment provided as the activity doesn't fall within the remit of EIA regulations under the Department of Agriculture, Food and the Marine.
Department of the Environment, Climate and Communications	Response received on 17 <sup>th</sup> April 2024, on behalf of Geological Survey of Ireland.	Geological Survey of Ireland response is highlighted below.
Department of Housing, Local Government and Heritage (NPWS)	Acknowledgement receipt of correspondence on 28 <sup>th</sup> March 2024 and 11 <sup>th</sup> October 2024 but no formal response has been received.	N/A
Forest Service	No response received.	N/A
Geological Survey of Ireland	Response received on 17 <sup>th</sup> April 2024	<ul style="list-style-type: none"> <li>› Records show that there are no County Geological Sites in the vicinity of the Proposed Wind Farm.</li> <li>› The Groundwater Vulnerability map indicates the range of groundwater vulnerabilities within the area covered is variable.</li> </ul>
Inland Fisheries Ireland	No response received	N/A
Irish Peatland Conservation Council	No response received	N/A
Irish Wildlife Trust	No response received	N/A
Heritage Officer-Tipperary County Council	No response received	N/A
The Heritage Council	No response received	N/A

#### 1.4.4

## Ecological Survey Methodologies

The following sections describe the methodologies followed to establish the baseline ecological condition of the Site and surrounding area.

A comprehensive survey of the biodiversity within the Site was undertaken to inform this assessment. Survey findings are provided in Section 3.2. 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 on various dates in 2023, 2024, and 2025. These are summarised in Table 1-2 below.

*Table 1-2 Summary of surveys undertaken.*

Survey Type	Date
Multidisciplinary walkover surveys (Wind Farm Site)	5 <sup>th</sup> March 2024, 31 <sup>st</sup> July 2024, 26 <sup>th</sup> September 2024, 27 <sup>th</sup> September 2024, 23 <sup>rd</sup> January 2025, 4 <sup>th</sup> March 2025, 21 <sup>st</sup> March 2025, 29 <sup>th</sup> October 2025
Multidisciplinary walkover surveys (Grid Connection Route)	10 <sup>th</sup> September 2024, 2 <sup>nd</sup> October 2025
Multidisciplinary walkover surveys (Turbine Delivery Route)	26 <sup>th</sup> September 2024, 27 <sup>th</sup> September 2024
Botanical Assessments	20 <sup>th</sup> June 2024, 21 <sup>st</sup> June 2024
Bird Surveys	April 2021 to May 2023, consisting of two breeding seasons (April – September) and two non-breeding seasons (October – March). See <b>Appendix 1</b>
Aquatic Surveys	10 <sup>th</sup> – 12 <sup>th</sup> and 17 <sup>th</sup> July 2024, 7 <sup>th</sup> – 10 <sup>th</sup> October 2024, 23 <sup>rd</sup> October 2025. See <b>Appendix 2</b>

#### 1.4.4.1 Ecological Multidisciplinary Walkover Surveys

Multidisciplinary walkover surveys were undertaken within the Site on the dates described above in Table 1-2. The majority of surveys were undertaken within the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith *et al.*, 2011). Surveys undertaken outside of the optimal period were repeat surveys and were used to target mammal signs within the winter period when vegetation cover is reduced. A comprehensive walkover of the entire Site was completed with incidental records also incorporated from other dedicated species/habitat specific surveys.

The walkover surveys were 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 Project (e.g. otter etc.).

The multi-disciplinary walkover surveys comprehensively covered the entire Site in addition to the proposed TDR, 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 Site are described in the following subsections.

#### 1.4.4.2 Otter Survey

As part of the multidisciplinary walkover survey, a search for indications of otter was carried out within the Proposed Wind Farm site. This search was conducted in order to determine the presence or absence of otter within the site. This involved a search for all potential indications of otter, as per NRA (2008) (spraint, tracks, couches, holts). The otter survey was conducted as per NRA Guidelines on

Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009). Following the results of the multidisciplinary surveys, no requirement for further, more detailed surveys for otter was identified.

In addition, targeted otter surveys were carried out by MKO within the Site and along the Proposed Grid Connection Route (see Aquatic Baseline Report, **Appendix 2**).

#### 1.4.4.3 Aquatic Surveys

Dedicated aquatic baseline surveys were undertaken along natural watercourses in the vicinity of the Site by MKO across multiple dates in 2024 and are detailed in the aquatic baseline report in **Appendix 2**. The 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 Site within the following sub-catchments<sup>5</sup>:

- > Suir\_SC\_060
- > Dead\_SC\_010
- > Mulkear\_SC\_010,
- > Mulkear\_SC\_020
- > Bilboa\_SC\_010
- > Shannon [Lower]\_SC\_090

Undertaken on a catchment-wide scale, the baseline surveys focused on the detection of freshwater habitats and species of high conservation value. These included surveys for white-clawed crayfish (*Austropotamobius pallipes*), freshwater pearl mussel (*Margaritifera margaritifera*), macro-invertebrates (biological water quality) and fish species, inclusive of supporting nursery and spawning habitat. The surveys also documented macrophyte and aquatic bryophyte communities including Annex I habitat associations in the vicinity of the Proposed Project. This holistic approach informed the overall aquatic ecological evaluation of each survey site in context of the Proposed Project 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 see **Appendix 2**).

#### 1.4.4.4 Invasive Species Survey

During the multidisciplinary walkover surveys, a search for non-native invasive species was undertaken. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) and the First Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No 374 of 2024). Where present, the extent and location of infestations was recorded, along with photographs.

#### 1.4.4.5 Bird Surveys

Dedicated bird surveys were undertaken during the survey period April 2021 to May 2023, consisting of two breeding seasons (April – September) and two non-breeding seasons (October – March). The Proposed Grid Connection Route was surveyed in September 2024 and October 2025 through a multidisciplinary walkover survey. The route was systematically walked, while the surveyor recorded a range of protected species, including birds. Further details on this survey are available in the Biodiversity Chapter (Chapter 6 of the accompanying EIAR).

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<sup>5</sup> River sub-catchment naming as per EPA Maps <https://gis.epa.ie/EPAMaps/>

Full details of all bird surveys undertaken within the Proposed Wind Farm site are provided in Chapter 7: Birds of the accompanying EIAR and those pertinent to this NIS are summarised below. Full details of the survey efforts are provided in **Appendix 1**.

Based on the results of the desk study, consultation and reconnaissance site visits described in Sections 7.2.1 to 7.2.3 of Chapter 7: Birds, of the accompanying EIAR, the assemblage of bird species within the Proposed Wind Farm site and the likely importance of the Proposed Wind Farm site for these species were ascertained. Then, adopting a precautionary approach, a site-specific scope for ornithological surveys was devised. The data collected in the field surveys is robust and allows clear, precise and definitive conclusions to be made on the avian receptors identified within the Proposed Wind Farm site.

The survey work that was undertaken between April 2021 and May 2023 forms the core dataset for the assessment of impacts on ornithology. In the absence of specific national bird survey guidelines, the ornithological surveys were designed and undertaken in full accordance with the guidance document 'Recommended bird survey methods to inform impact assessment of onshore wind farms' (SNH, 2017). The various ornithological surveys undertaken at the Wind Farm Site and hinterland are described in detail below.

#### 1.4.4.5.1 **Methodology**

##### Vantage Point Surveys

Vantage point surveys were undertaken in accordance with SNH (2017) to monitor flight activity within the Proposed Wind Farm site and to a 500m radius of the proposed turbine locations. Surveys were conducted from five fixed point vantage points with comprehensive coverage of the Proposed Wind Farm site. The vantage point locations were selected by undertaking a viewshed analysis (described below) and confirmed by a reconnaissance visit and initial field surveys to ensure that the proposed turbine layout was entirely covered.

Viewsheds were calculated using the Visibility Analysis plugin (Version 1.8) over a raster digital elevation model (DEM) in QGIS (Version 3.28). Note that while the relevance of being able to view as much of the Proposed Wind Farm site to ground level is acknowledged, the NatureScot guidance emphasises the importance of visibility of the 'collision risk volume' when the data is to be used to estimate the risk of collision with turbines by birds. Therefore, the viewshed analysis aims to identify the most suitable locations to site vantage points such that the airspace of the turbine rotor swept area is in view using the fewest possible number of vantage points. As no specific turbine model was confirmed at the outset of surveys, the viewsheds were based on a notional layer suspended 22m above the ground. The vantage point locations were tested for visibility coverage by creating a point 1.75m in height (to represent the height of the surveyor) on a map using 10m contours terrain data. The relative height of any surrounding landscape features (e.g. trees) and their effects on visibility was also accounted for in the analysis. The software produced 360° viewsheds 22m above ground level up to a 2km radius around the vantage points. These viewsheds were then cropped to a 180° arc representing the area visible to the surveyor.

Survey methodology followed SNH (2017). The surveyor collected data on bird observations and flight activity from the scanning arc of 180° to a 2km radius at the fixed vantage point locations for two 3-hour watches separated by a minimum 30-minute break (i.e., 6 hours total) per month. Surveys were conducted every month of the survey period and were scheduled to provide a minimum of 36 hours per winter or breeding season and spread over the full daylight period, including dawn and dusk watches, to coincide with the highest periods of bird activity (Table 1-3).

Table 1-3 Vantage point survey watch duration.

Survey Season and Number of Vantage Points (VPs)	Effort per Vantage Point (VP)
Breeding Season 2021 (5 VPs)	36 hours per VP
Winter Season 2021/2022 (5 VPs)	36 hours per VP
Breeding Season 2022 (5 VPs)	36 hours per VP
Winter Season 2022/2023 (5 VPs)	36 hours per VP

Flight activity of target species was mapped and recorded as per defined flight bands which were chosen in relation to the dimensions of potential turbine models for the site. Bands were split into 0-15m, 15-25m, 25-200m and >200m. All flight activity within a height band 15-25m and 25-200m is considered to be within the Potential Collision Height (PCH) with regard to the turbine swept area. In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat. Survey effort is presented in **Appendix 1**, including full details of dates, times and weather conditions for each survey.

### Breeding Walkover Surveys

Breeding walkover surveys were undertaken to determine possible, probable or confirmed breeding bird activity within the Proposed Wind Farm site and to a 500m radius. The methodology was based on Brown and Shepherd (1993) and Calladine *et al.* (2009), combined with Common Bird Census methods (British Trust for Ornithology, 2021) for dense habitat. Transect routes were walked across different habitat complexes within the survey area, where access allowed. Using binoculars, the surveyor regularly scanned the surroundings of each transect for target species. All target species were mapped and breeding status was assigned following British Trust for Ornithology (BTO) breeding status codes (<https://www.bto.org/our-science/projects/birdatlas/methods/breeding-evidence>). In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat.

Breeding walkover surveys were conducted in daylight over four visits during the core breeding season months April to July. Survey effort is presented in **Appendix 1**, including full details of dates, times and weather conditions for each survey.

### Breeding Raptor Surveys

Raptors include all harrier, falcon, buzzard, eagle, hawk, owl, kite and osprey species. Breeding raptor surveys were undertaken within the Wind Farm Site and to a 2km radius to identify occupied territories and monitor their breeding success near or within the Proposed Wind Farm site. Survey methodology followed Hardey *et al.* (2013). Raptor surveys were undertaken in the form of short vantage point watches. All raptor species observed were recorded and mapped and breeding status was assigned following BTO breeding status codes. Surveyors did not approach nest sites to avoid disturbance.

Each breeding raptor location was surveyed once per month during the core breeding season between April and July. Survey effort is presented in **Appendix 1**, including full details of dates, times and weather conditions for each survey.

### Winter Walkover Surveys

Winter walkover surveys were undertaken to record the presence of bird species within the Proposed Wind Farm site to a 500m radius, including areas between vantage point locations. The methodology follows described in Bibby *et al.* (2000) and Gilbert *et al.* (1998), combined with Common Bird Census methods (British Trust for Ornithology, 2021). Transect routes were walked across different habitat

complexes within the survey area where access allowed. All target species were recorded and mapped. In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat.

Winter walkover surveys were conducted in daylight hours over four visits between October and March (i.e., four visits in winter 2021/2022 and four visits in winter 2022/2023). Survey effort is presented in **Appendix 1**, including full details of dates, times and weather conditions for each survey.

### Hen Harrier Roost Surveys

Hen harrier is an SCI species for which Slievefelim to Silvermines SPA is designated. Therefore, hen harrier roost surveys were undertaken. Hen harrier roost surveys were undertaken within the Proposed Wind Farm site and to a 2 km radius. These surveys aimed to identify active winter hen harrier roosts near or within the Proposed Wind Farm site. Survey methodology followed Gilbert *et al.* (1998) and O'Donoghue (2019). Roost watches of 2-3 hours were conducted at six hen harrier vantage point locations from dusk until last visible light during which all hen harrier observations were recorded and mapped.

Each hen harrier vantage point was surveyed once per month during the winter season between October and March inclusive (in winter 2021/2022 and 2022/2023). Survey effort is presented in **Appendix 1**, including full details of dates, times and weather conditions for each survey.

### Multidisciplinary Walkover Survey

The Proposed Grid Connection Route was surveyed in September 2024 and October 2025 through a multidisciplinary walkover survey. The route was systematically walked, while the surveyor recorded a range of protected species, including birds. Further details on this survey are available in the Biodiversity Chapter (Chapter 6 of the accompanying EIAR).

#### 1.4.4.6 Other Fauna

Whilst additional targeted surveys for bats (Annex II), marsh fritillary (Annex II), and mammal species were carried out to inform Chapter 6: Biodiversity within the EIAR, these were intended to provide a baseline for non-SAC/SPA populations and therefore, are not pertinent to this NIS.

## 1.5 Structure and Format of this Document

The structure and format of this NIS is set out below:

- › **Section 1** provides an introduction, background information, methodology and statement of authority for the AASR and NIS.
- › **Section 2** provides a full description of all elements of the Proposed Project.
- › In **Section 3**, the characteristics of the receiving environment are fully described.
- › In **Section 4**, a Stage 1 Appropriate Assessment Screening is undertaken to identify any European Sites upon which there is a potential for a likely significant effect to occur either individually or in combination with other plans and projects as a result of the Proposed Project.
- › **Section 5** provides a detailed consideration of the European Sites determined to be located within the Likely Zone of Influence and identifies the relevant qualifying features and how they may be affected in light of their conservation objectives.
- › **Section 6** provides an assessment of the potential for adverse effects on the identified European Sites as a result of the Proposed Project and in the absence of mitigation. This section also prescribes mitigation to robustly block any identified pathways for impact for effect.

- › **Section 7** provides an assessment of residual effects taking into consideration the proposed mitigation.
- › In **Section 8**, the potential in-combination effects of the Proposed Project on European Sites, when considered in combination with other plans and projects, is assessed.
- › A concluding statement is provided in **Section 9**.

## 2. DESCRIPTION OF PROPOSED PROJECT

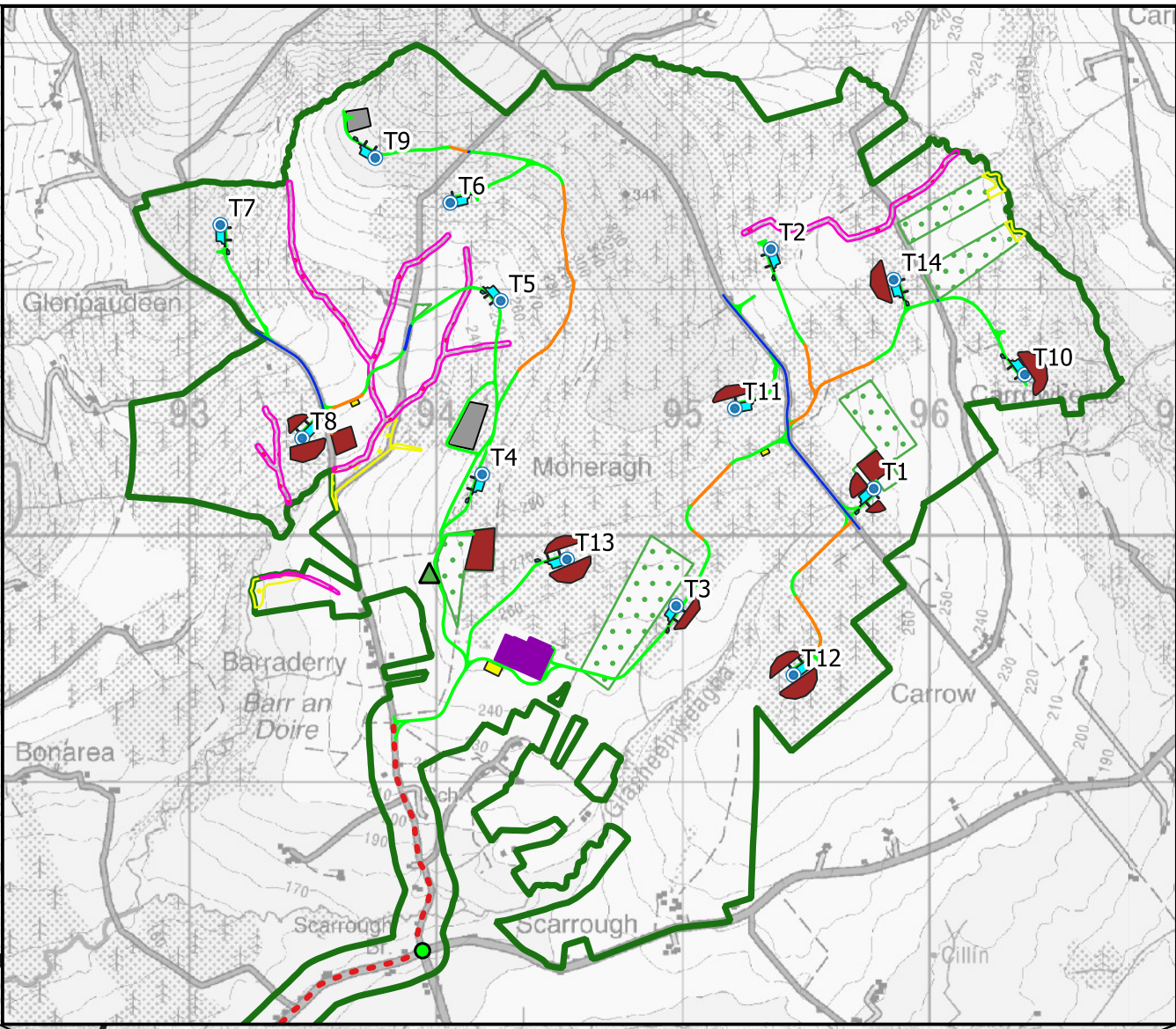
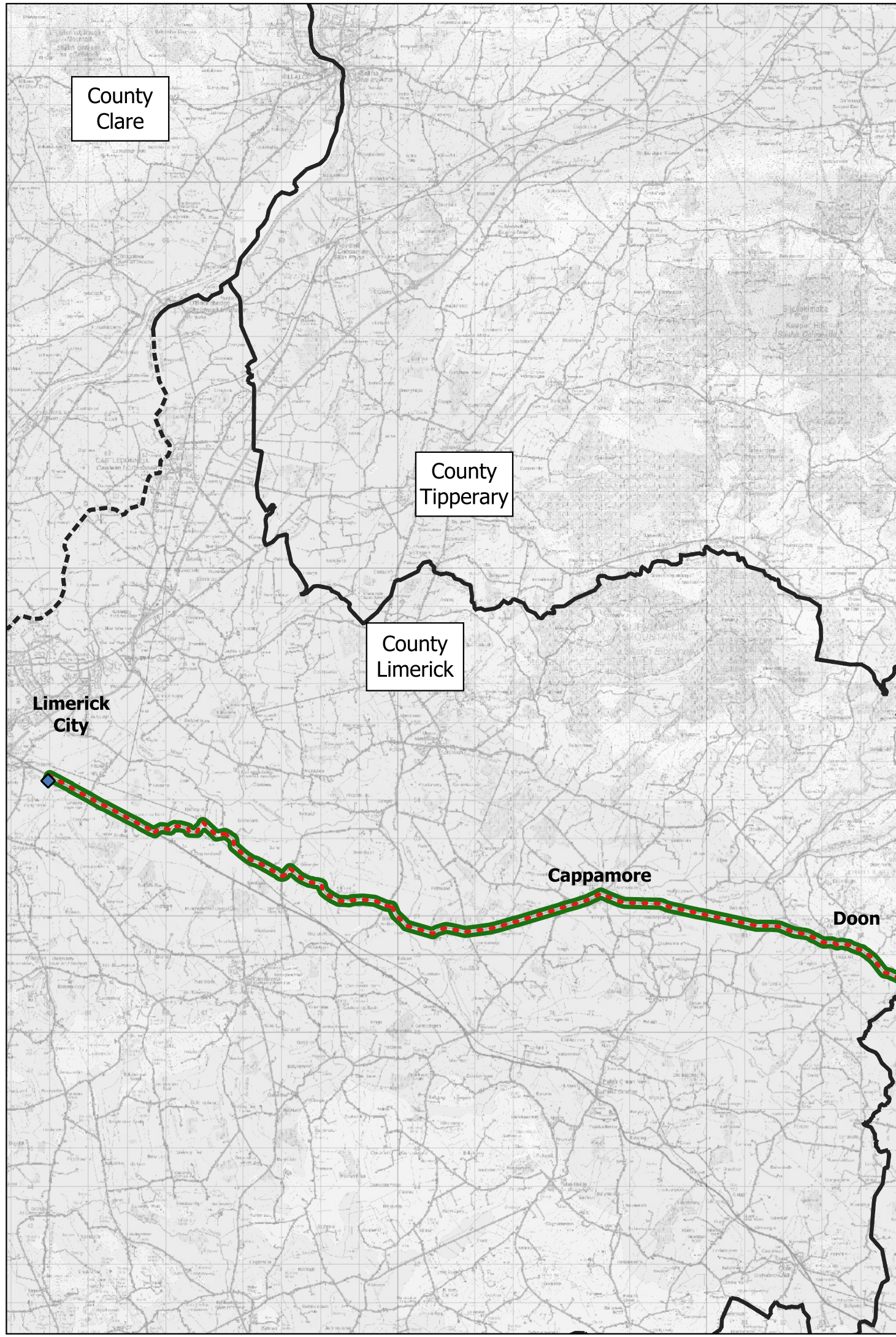
### 2.1 Site Location

The Proposed Wind Farm turbines are located approximately 2.3km south of the village of Hollyford and 4.3km north of the village of Dundrum, Co. Tipperary. It is proposed to access the Proposed Wind Farm site during both the construction and operational phase via a site entrance off the L1154 local road along the southwestern boundary of the Proposed Wind Farm site in the townland of Moheragh. The proposed entrance will include temporary accommodation works in order to facilitate the delivery of turbine components and other abnormal loads. The Proposed Wind Farm is served by a number of existing public, forestry and agricultural roads and tracks. A site location context map and the EIAR Site Boundary is shown as Figure 2-1.

The Proposed Grid Connection Route includes for underground 110kV grid connection cabling from the proposed onsite 110kV substation, in the townland of Moheragh, Co. Tipperary to the existing Killonan 110kV substation in the townland of Milltown, Co. Limerick. The Proposed Grid Connection Route to Milltown, Co. Limerick measuring approximately 37.6km in length, is primarily located within the public road corridor. Approximately 3.2km is proposed within National Roads, 15.5km proposed within Regional Roads, 16.9km proposed within Local Roads, 900 meters proposed within the Proposed Wind Farm internal road network and approximately 1.1km proposed within agricultural lands in Brittas, Cloghnadromin and Kishyquirk, Co. Limerick.

Accommodation works will be required at various locations on the national and regional road network between the port of entry and the Proposed Wind Farm site. These will be limited to temporary measures including temporary local road widening, temporary access road through agricultural land, overruns of roundabout islands and temporary relocation of some signs and street furniture.

Current land-use on the Proposed Wind Farm comprises commercial forestry, agricultural pastoral land, mixed forest and transitional woodland-shrub. Current land-use along the Proposed Grid Connection Route comprises of public road corridor, public open space, low-density residential, urban fabric, agriculture, mineral extraction, commercial forestry and mixed forest. Land-use in the wider landscape of the site comprises a mix of agriculture, quarrying, renewable energy, low density residential and commercial forestry. Land-use in the areas proposed for turbine delivery route accommodation comprises a mix of agriculture, transitional woodland-shrub, coniferous forest and sport and leisure facilities.



### Map Legend

- EIAR Site Boundary
- Proposed Turbine Location
- Proposed Hardstand
- Proposed Met Mast
- Proposed Existing Public Roads to be Maintained
- Proposed New Road
- Proposed Existing Road Upgraded
- Temporary Construction Compound
- Proposed Spoil Management Areas
- Proposed Borrow Pits
- Proposed 110kV Underground Grid Connection Cable
- Proposed 110kV Substation with Battery Storage
- Existing Killonan 110kV Substation
- Location of Temporary Accommodation Works
- Proposed Riparian Buffer
- Proposed Wet Grassland Management
- Proposed Woodland Management
- County Boundary

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Drawing Title	
<b>Proposed Project</b>	
Project Title	
<b>Carrow Wind Farm</b>	
Drawn By	Checked By
ER	EMC
Project No.	Drawing No.
231102	Figure 2-1
Scale	Date
1:120,000	2026-03-25
<p style="font-size: 8px; line-height: 1;">MKO Planning and Environmental Consultants Tuam Road, Galway Ireland, H91 W8H4 +353 (0) 91 735611 email: info@mkofireland.ie Website: www.mkofireland.ie</p>	

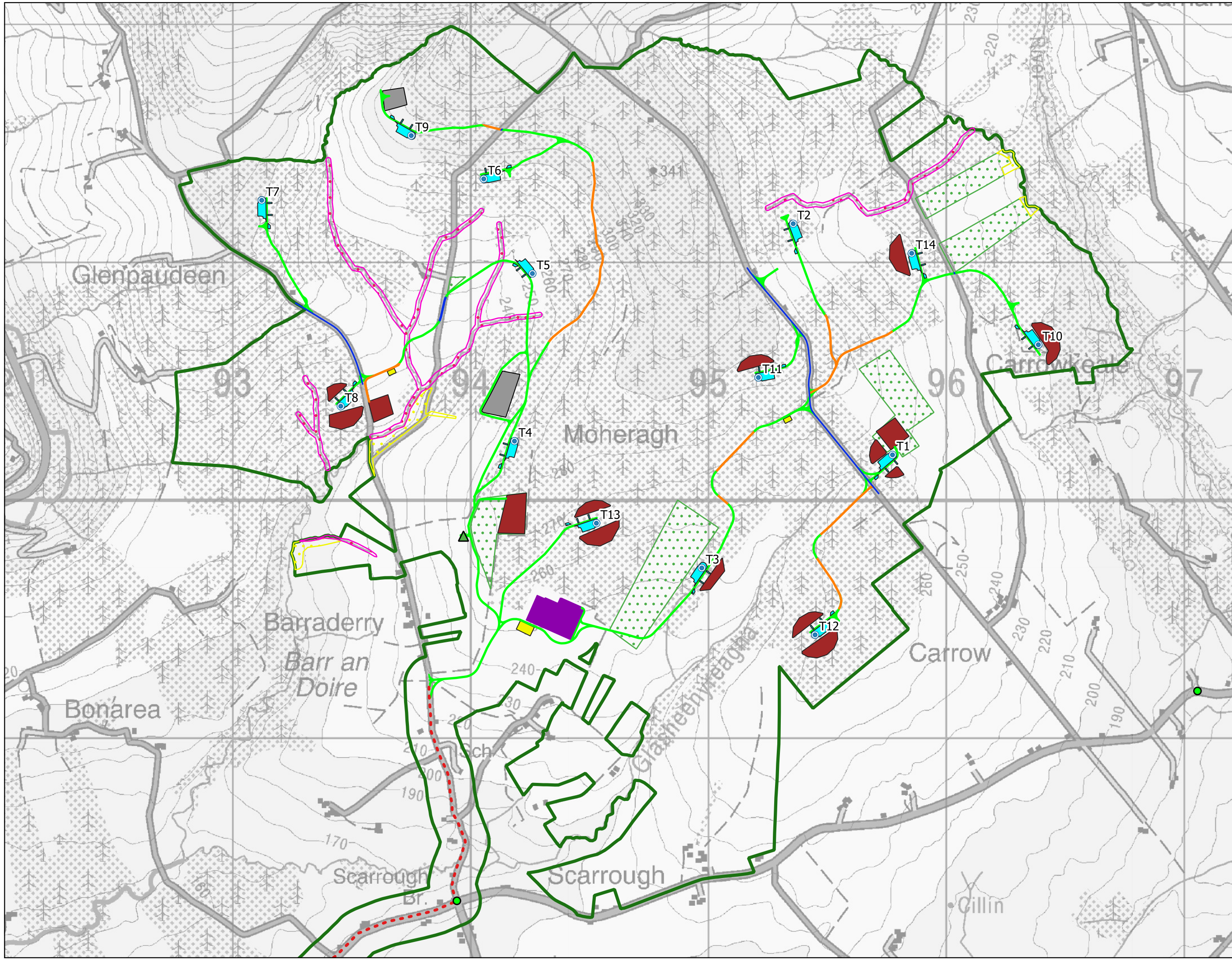
## Development Components of the Proposed Project

The Proposed Wind Farm will consist of the following:

- i. The construction of 14 no. wind turbines with an overall turbine tip height of 185 metres; a rotor blade diameter of 163 metres; and hub height of 103.5 metres, and associated foundations and hard standing areas;*
- ii. A permanent 110kV substation compound (2 no. control buildings with welfare facilities, all associated electrical plant and equipment, security fencing, entrance on to existing track, all associated underground cabling, wastewater holding tank, site drainage and all ancillary works;*
- iii. Underground internal wind farm electrical cabling and communications cabling connecting the wind turbines to the proposed on-site 110kV electrical substation and associated ancillary works;*
- iv. A meteorological mast of 103.5m in height, and associated foundation and hard-standing area;*
- v. All works associated with the upgrade of the existing agricultural access off the L1154 local road (including the installation of fencing and steel gates) to serve as the main site entrance for the wind farm;*
- vi. The provision of 4 no. new access points along the L1154;*
- vii. The provision of 4 no. new access points along the L-5117;*
- viii. The provision of 5 no. new access/egress point L-5206;*
- ix. The provision of 2 no. new access points along the L-52061;*
- x. Upgrade of existing tracks/roads and junctions and provision of new site access roads and junctions;*
- xi. 3 no. temporary construction compounds with temporary offices and staff welfare facilities;*
- xii. Accommodation works along the public road network in the townlands of Camus, Ballynahinch, Kilshenane, Dundrum, Gortarush Lower, Carrow, Scarrough, and Moheragh, Co. Tipperary to facilitate the delivery of turbine components and other abnormal loads;*
- xiii. 2 no. Borrow Pits;*
- xiv. Spoil Management;*
- xv. Site Drainage;*
- xvi. Tree Felling and hedgerow removal;*
- xvii. Biodiversity Management and Enhancement Measures;*
- xviii. Operational stage site signage;*
- xix. Battery Energy Storage System and all associated electrical plant and equipment, security fencing, 2 no. static water storage tanks and a firewater retention tank, and all associated infrastructure and apparatus;*
- xx. The provision of underground electrical (110kV) and communications cabling from the proposed on-site 110kV electrical substation to the existing Killonan 110kV electrical substation to facilitate the connection to the national grid (RPS S018);*
- xxi. Provision of 58 no. joint bays, communication chambers and earth sheath links along the proposed underground electrical cabling route;*
- xxii. Reinstatement of land, road and track surface above the proposed cabling trench; and*
- xxiii. All related site works and ancillary development considered necessary to facilitate the proposed development, including landscaping and the reinstatement of land.*

The application is seeking a ten-year planning permission for development and a 35-year operational life from the date of commissioning of the entire wind farm.

The full range of turbine options and dimensions of the Proposed Project have been assessed as part of this report. The layout of the Proposed Wind Farm is provided in Figure 2-2. Detailed site layout drawings of the Proposed Project are included in **Appendix 3** of this report.



### Map Legend

- EIAR Site Boundary
- Proposed Turbine Location
- Proposed Hardstand
- Proposed Met Mast
- Proposed Existing Public Roads to be Maintained
- Proposed New Road
- Proposed Existing Road Upgraded
- Temporary Construction Compound
- Proposed Spoil Management Areas
- Proposed Borrow Pits
- Proposed 110kV Underground Grid Connection Cable
- Proposed 110kV Substation with Battery Storage
- Location of Temporary Accommodation Works
- Proposed Riparian Buffer
- Proposed Wet Grassland Management
- Proposed Woodland Management

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Drawing Title	
<b>Proposed Wind Farm site</b>	
Project Title	
<b>Carrow Wind Farm</b>	
Drawn By	Checked By
ER	EMC
Project No.	Drawing No.
231102	Figure 2-2
Scale	Date
1:14,000	2026-03-25
<p style="font-size: 8px; line-height: 1;">MKO Planning and Environmental Consultants Tuam Road, Galway Ireland, H91 W8H4 +353 (0) 91 735611 email: info@mkofireland.ie Website: www.mkofireland.ie</p>	

2.3

## Detail on Development Components of the Proposed Wind Farm site

The following sections will describe each of the development components of the Proposed Wind Farm site within this planning application in further detail, in the following order:

- > *Wind Turbines*
- > *Site Roads*
- > *Site Underground Electrical and Communications Cabling*
- > *Meteorological Mast*
- > *Temporary Construction Compounds*
- > *Biodiversity Enhancement and Management Plan*
- > *Tree Felling*
- > *Borrow Pit*

Detailed site layout drawings of the Proposed Project are included in **Appendix 3** of this report.

2.3.1

### Wind Turbines

2.3.1.1

#### Turbine Locations

The Proposed Wind Farm turbine layout has been verified using industry standard wind farm design software ensuring that it maximises the energy yield from the Proposed Project, while maintaining sufficient distances between the proposed turbines so as to ensure turbulence and wake effects do not compromise turbine performance. The Grid Reference coordinates of the proposed turbine locations are listed in Table 2-1 below.

The final finished top of foundation level of the turbine foundations will be determined by the actual ground conditions at each proposed turbine location and may differ slightly from those levels listed in Table 2-1. Also, in accordance with the ‘*Wind Energy Development Guidelines for Planning Authorities*’ (Department of the Environment, Heritage and Local Government (DOEHLG), 2006) micro-siting of the turbine positions may be required within the criteria set out in the guidelines.

*Table 2-1 Proposed Wind Turbine Locations and Elevations*

Turbine	ITM Coordinates		Existing Elevation (m OD)
	X (ITM)	Y (ITM)	
T1	595726	650235	261
T2	595309	651206	272
T3	594925	649760	251
T4	594137	650293	270
T5	594213	650997	255
T6	594008	651395	293

T7	593075	651305	300
T8	593407	650439	216
T9	593703	651577	318
T10	596339	650698	201
T11	595163	650560	293
T12	595401	649479	260
T13	594482	649948	265
T14	595807	651082	241

### 2.3.1.2 Turbine Type

Wind turbines use the energy from the wind to generate electricity. A wind turbine consists of four main components:

- > Foundation unit
- > Tower
- > Nacelle (turbine housing)
- > Rotor

The proposed wind turbines to be installed on the site will have the following dimensions:

- > Turbine Tip Height – 185 metres
- > Hub Height – 103.5 metres
- > Rotor Diameter - 163 metres.
- > Blade length – 81.5 metres

Modern wind turbines from the main turbine manufacturers have evolved to share a common appearance and other major characteristics, with only minor cosmetic differences differentiating one from another. The wind turbines that will be installed on the Proposed Wind Farm site will be conventional three-blade turbines, that will be geared to ensure the rotors of all turbines rotate in the same direction at all times.

It should also be noted that the assessment of the development footprint of the Proposed Wind Farm site, within this report, is based on the maximum potential footprint for all of the infrastructural elements. This precautionary approach is taken as the assessment of the maximum development footprint will, in the absence of mitigation measures, give rise to the greatest potential for significant effects. Should the development footprint be less than the maximum, the potential for significant effects will also be reduced.

### 2.3.1.3 Turbine Foundations

Each wind turbine is secured to a reinforced concrete foundation that is installed below the finished ground level. The size of the foundation will be dictated by the turbine manufacturer, and the final turbine selection will be the subject of a competitive tender process. Different turbine manufacturers use different shaped turbine foundations, ranging from circular to hexagonal and square, depending on the requirements of the final turbine supplier and a foundation area large enough to accommodate

modern turbine models has been assessed in the accompanying EIAR. The turbine foundation transmits any load on the wind turbine into the ground. Where ground conditions do not favour the use of the excavate and replace method (gravity), piles (bored or driven) will be installed to formation level.

The maximum horizontal and vertical extent of the turbine foundation will be 25m and 4m respectively.

After the foundation level of each turbine has been formed on competent strata (i.e. bedrock or subsoil of sufficient load bearing capacity) or using piling methods, the “Anchor Cage” (anchors the first section of the turbine tower to the foundation) is levelled and reinforcing steel is then built up around and through the anchor cage. The outside of the foundation is shuttered with demountable formwork to allow the pouring of concrete and is backfilled accordingly with appropriate granular fill to finished surface level.

#### 2.3.1.4 **Hardstanding Areas**

Hard standing areas consisting of levelled and compacted hardcore are required around each turbine base. These will facilitate access, turbine assembly and turbine erection. The hard-standing areas are used to accommodate cranes used in the assembly and erection of the turbine. The hardstands also allow for the offloading and storage of turbine components, and generally provide a safe, level working area around each turbine position. The hard-standing areas are extended to cover the turbine foundations, once completed, by placing crushed stone over the foundation. The arrangement and positioning of hard standing areas are dictated by turbine suppliers. All crane hardstand areas will be designed taking account of the loadings provided by the turbine manufacturer and will consist of a compacted stone structure. The crane hardstands will be constructed in a similar manner to the excavated site roads. The proposed hard standing areas for each individual turbine are shown as part of the detailed layout drawings included in **Appendix 3** and represent the maximum sizes required.

However, the extent of the required areas at each turbine location may be optimised on-site within the parameters set out and assessed in the accompanying EIAR. This will depend on the turbine supplier’s exact requirements.

#### 2.3.1.5 **Assembly Area**

Levelled assembly areas will be located on either side of the hard-standing area. These assembly areas are required for offloading turbine blades, tower sections and hub from trucks until such time as they are ready to be lifted into position by cranes and to assist the main crane during turbine assembly. The extent of the area required for the assembly areas is shown on the detailed drawing in **Appendix 3**.

#### 2.3.1.6 **Power Output**

Current and future wind turbine generator technology will ensure that the wind turbine model, chosen for the Proposed Project, will have an operational lifespan greater than the 35-year operational life that is being sought as part of the planning application. Each of proposed wind turbines will have a generating capacity of 6.2 MW. Turbines of the exact same make, model and dimensions can have different power outputs depending on the capacity of the electrical generator installed in the turbine nacelle. The exact power rating of the installed turbine will be designed to match the wind regime on the Proposed Wind Farm site and will be determined by the selected manufacturer.

For the purposes of this report, a rated output of 6.2 MW has been chosen to calculate the power output of the proposed 14-turbine renewable energy development, which would result in an estimated installed capacity of 86.8 MW.

Assuming an installed capacity of 86.8 MW, the Proposed Wind Farm therefore has the potential to produce up to 273,733 MWh (megawatt hours) of electricity per year, based on the following calculation:

$$A \times B \times C = \text{Megawatt Hours of electricity produced per year}$$

where: A = ..... The number of hours in a year: 8,760 hours

B = ..... The capacity factor, which takes into account the intermittent nature of the wind, the availability of wind turbines and array losses etc. A capacity factor of 36% is applied here<sup>6</sup>.

C = ..... Rated output of the wind turbines: 86.8 MW

The 273,733 MWh of electricity produced by the Proposed Wind Farm would be sufficient to supply approximately 65,174 Irish households with electricity per year, based on the average Irish household using 4.2 MWh of electricity<sup>7</sup> (this latest figure is available from the March 2017 CER Review of Typical Consumption Figures Decision Paper). For context, according to the latest Census 2022 data, there are 62,232 households located in Co. Tipperary.

## 2.3.2 Site Roads

### 2.3.2.1 Road Construction Types

To provide access within the Proposed Wind Farm site and to connect the wind turbines and associated, infrastructure, existing roads and tracks will need to be upgraded and new access roads will need to be constructed. The road construction design has taken into account the following key factors:

1. *Buildability considerations;*
2. *Serviceability requirements for construction and wind turbine delivery and maintenance vehicles*
3. *Horizontal longitudinal and cross-fall gradient of the roads;*
4. *Minimisation of excavation arisings;*
5. *Making use of existing infrastructure where possible;*

Whilst the above key factors are used to determine the road design the actual construction technique employed for a particular length of road will be determined on the prevailing ground conditions encountered along that length of road.

It is proposed to upgrade approximately 2.6 km of existing site roads and tracks, and to construct approximately 12.9 km of new access road on the Proposed Project site. It is proposed to construct passing bays along the proposed access road network to allow construction traffic to safely pass each other. Areas such as wide junctions and proposed hardstands will also be used as passing bays throughout the construction phase of the Proposed Wind Farm site.

#### 2.3.2.1.1 Upgrade of Existing Access Roads or Tracks

As noted above, approximately 2.6 km of existing roads and access tracks will be upgraded as part of the Proposed Wind Farm construction phase. The existing tracks onsite were constructed using the

<sup>6</sup> *Eirgrid, 2022 Enduring Connection Policy 2.2 Constraints Report for Area H2 Solar and Wind [ECP-2-2-Solar-and-Wind-Constraints-Report-Area-H2-v1.0.pdf](https://www.eirgridgroup.com/~/media/2022/03/ECP-2-2-Solar-and-Wind-Constraints-Report-Area-H2-v1.0.pdf) ([eirgridgroup.com](https://www.eirgridgroup.com))*

<sup>7</sup> *March 2017 CER (CRU) Review of Typical Consumption Figures Decision Paper [https://www.cru.ie/document\\_group/review-of-typical-consumption-figures-decision-paper/](https://www.cru.ie/document_group/review-of-typical-consumption-figures-decision-paper/)*

excavate and replace construction technique, therefore proposed road widening will be founded on competent stratum.

### 2.3.2.1.2 Construction of New Roads

As noted above, approximately 12.9km of new roads will be constructed in order to facilitate the Proposed Wind Farm. Due to the ground conditions, new access tracks proposed on site are proposed to be founded and located on competent stratum. The make-up of the founded access tracks is a stone thickness of c. 400mm.

## 2.3.3 Site Underground Electrical and Communications Cabling

Each turbine and the meteorological mast (refer to Section 2.3.4 below) will be connected to the on-site electricity substation via underground (kilovolt) electricity cabling. Fibre-optic cables will also connect each wind turbine and the met mast to the onsite substation. The electricity and fibre-optic cabling connecting to the onsite substation compound will be run in cable ducts in the road or direct buried alongside the internal tracks approximately 1.2 metres beneath ground level to the top of the cable. The route of the cable will follow the access track to each turbine location and are illustrated on the site layout drawings included as **Appendix 3**, the exact number and configuration of cable may vary within the cabling trench. Plate 2-1 below shows two variations of a typical site cabling trench, one for off-road trenches and one for on-road trenches. The cabling may be placed on either side of the roads, on both sides of the road or within the road. The exact configuration of the underground cabling will be set by the requirements of the electrical designers at detailed design stage.

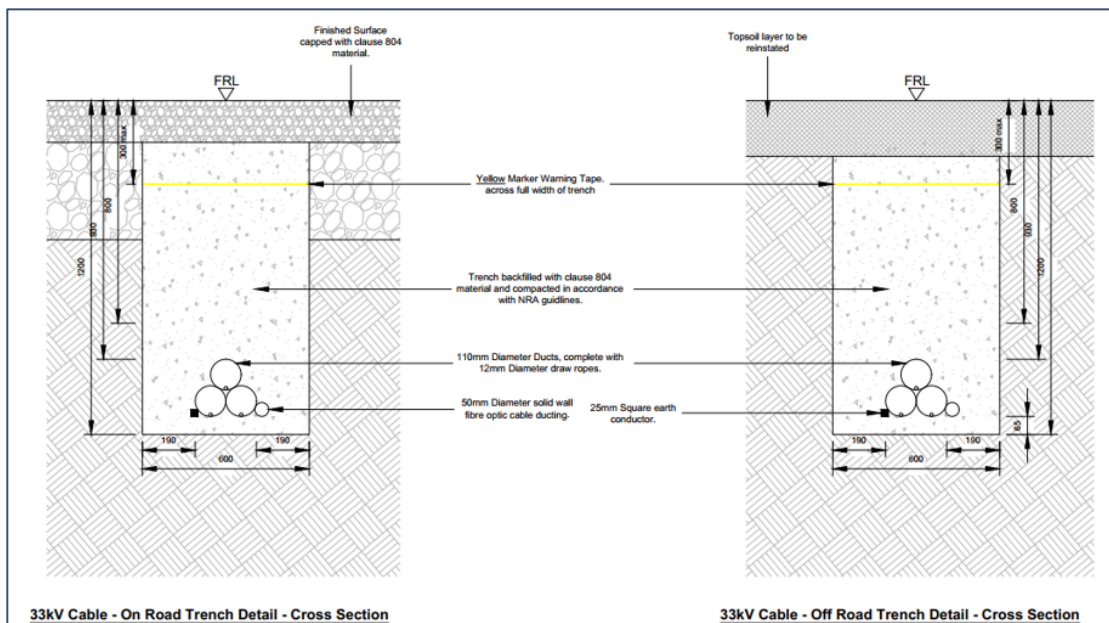


Plate 2-1 Cabling trench cross section detail.

Clay plugs (water flow barrier) will be installed at regular intervals of not greater than 50 metres along the length of the trenches where required to prevent the trenches becoming conduits for runoff water. Backfill material will be compacted in layers with approved engineer's specified material, which may be

imported onto the Proposed Wind Farm site should sufficient volumes of suitable material not be encountered during the excavation phase of the proposed infrastructure.

### 2.3.4 Meteorological Mast

One meteorological (met) mast is proposed as part of the Proposed Wind Farm site. The met mast will be equipped with wind monitoring equipment at various heights. The proposed met mast will be located at N593923, E649893 (ITM). The mast will be a free-standing slender lattice structure 103.5 metres in height. The mast will be constructed on a hard-standing area sufficiently large to accommodate the equipment that will be used to erect the mast.

### 2.3.5 Temporary Construction Compounds

Three temporary construction compounds will be located within the Proposed Wind Farm site. The primary construction compound will be located opposite the Proposed 110kV Substation, measuring approximately 2,610 square meters (m<sup>2</sup>) in area. The second construction compound will be located approximately 240m northeast of Turbine 8 and a third construction compound will be located approximately 200m southeast of Turbine No. 11, both measuring approximately 650 m<sup>2</sup>.

The temporary construction compounds will consist of temporary site offices, staff welfare facilities, construction materials storage and car-parking areas for staff and visitors.

Temporary toilets, located within staff portacabins, will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by a permitted waste collector to wastewater treatment plants. There will also be a water supply on site for hygiene purposes, by way of a temporary storage tank.

The temporary construction compounds will also include a bunded refuelling and containment area for the storage of oil, lubricants and site generators etc, and full retention oil interceptor.

Once the Proposed Wind Farm has been commissioned these compounds will be removed. These areas will be reinstated with previously excavated spoil, and either be reseeded or left to revegetate naturally.

Construction materials and turbine components will be brought directly to the proposed use and turbine locations following their delivery to the Proposed Wind Farm site.

### 2.3.6 Biodiversity Enhancement and Management Plan

A Biodiversity Enhancement and Management Plan (BEMP) has been prepared for the Proposed Project. This plan has been developed to offset the loss of habitats identified within the Proposed Wind Farm site and further enhance the biodiversity of the site and its environs. It is proposed to manage and bolster approximately 3.3 ha of semi-natural woodland habitat within the Proposed Wind Farm site. This measure will create additional habitat for commuting and foraging fauna, including bats, badger and other protected fauna, within the Proposed Wind Farm site. Approximately 30.2 ha of important wet grassland habitat will be managed to enhance marsh fringing habitat. It is proposed to plant approximately 9.9 ha of riparian woodland either side of mapped watercourses within the Proposed Wind Farm site. This measure will create a linear feature for commuting and foraging fauna, including bats, badger and other protected fauna, within the Proposed Wind Farm site.

### 2.3.7 Tree Felling

As part of the Proposed Project, tree felling will be required within and around the development footprint to allow for the construction of the turbine bases, access roads underground cabling, and the other ancillary infrastructure.

A significant portion (66%) of the Proposed Wind Farm site comprises commercial forestry. A total of approximately 51.6 hectares of commercial forestry will be permanently felled as part of the Proposed Project along with existing treeline boundaries.

The commercial forestry felling activities required as part of the Proposed Project will be the subject of a Limited Felling Licence (LFL) application to the Forest Service in accordance with the Forestry Act 2014 and the Forestry Regulations 2017 (SI 191/2017) and as per the Forest Service's policy on granting felling licenses for wind farm developments. The policy requires that a copy of the planning permission for the Proposed Project be submitted with the felling licence application; therefore the felling licence cannot be applied for until such time as planning permission is obtained for the Proposed Project.

#### 2.3.7.1 Forestry Replanting

In line with the Forest Service's published policy on granting felling licences for wind farm developments, areas cleared of forestry for access roads, and any other wind farm-related uses will have to be replaced by replanting at an alternative site or sites. The Forest Service policy requires replacement or replanting on a hectare for hectare basis for the footprint of the infrastructure developments.

The estimated 51.6 hectares that will be permanently felled for the footprint of the Proposed Project infrastructure will be replaced or replanted on a hectare for hectare basis as a condition of any felling licence that will be issued in respect of the Proposed Project. Replanting is a requirement of the Forestry Act and is primarily a matter for the statutory licensing processes that are under the control of the Forest service.

The replacement of the 51.6 hectares of forestry can occur anywhere in the State subject to licence. The replacement of forestry, felled as part of the Proposed Project, may occur on any lands, within the state, benefitting from Forest Service Technical Approval for afforestation, should the Proposed Project receive planning permission. Under the Forestry Regulations 2017, all applications for licences for afforestation require the prior written approval (technical approval) of the Minister for Agriculture, Food and the Marine. Before the Minister can grant approval, he/she must first determine if the project is likely to have significant effects on the environment (for EIA purposes) and assess if the development, individually or in combination with other plans or projects is likely to have a significant effect on a European site (for Habitats purposes).

### 2.3.8 Borrow Pit

It is estimated that approximately 272,490 cubic metres (m<sup>3</sup>) of stone material will be required to construct the Proposed Project. It is intended to obtain the majority of materials for the construction of the Proposed Project from the proposed onsite borrow pits (engineer's specified material may be imported onto the Site should sufficient volumes of suitable material not be encountered during the excavation phase of the proposed infrastructure, to come from local licenced quarries). The primary borrow pit is located approximately 107m northwest of T4 and measures approximately 16,910m<sup>2</sup> in area. The second borrow pit will be located approximately 130m north of Turbine 9 and measures approximately 7,390 m<sup>2</sup>.

Access to the primary borrow pit will be via a proposed new access road running along the western edge of the borrow pit. Access to the secondary borrow pit will be via a proposed new access road running along the western edge of the borrow pit. Post-construction, the borrow pits will be reinstated with excavated spoil and profiled to match the existing ground levels, insofar as possible. The borrow pit areas will then be reseeded. A stock-proof fence will be erected around the borrow pit areas, to prevent unauthorised access, during the construction phase and until the borrow pits have been fully reinstated.

The extraction of material from the borrow pits is a construction phase activity only of the Proposed Project which will be a temporary operation run over a short period of time during the construction phase. The topsoil and subsoil will be stripped back and temporarily stockpiled using standard tracked excavators. Hardcore materials will be extracted from the borrow pits (and some turbine locations, if necessary), principally by means of rock breaking. Depending on the hardcore volume, blasting may also be used as a more effective rock extraction method, capable of producing significant volumes of rock in a matter of milliseconds. Blasting will only be carried out after notifying any potentially sensitive receptors. The processing and crushing of boulders may be required to achieve the grading requirements for use in construction. Post-construction, any unsafe areas around the borrow pit areas will be permanently secured, and a stock-proof fence will be erected around the borrow pit areas to prevent access to these areas. Appropriate health and safety signage will also be erected on this fencing and at locations around the fenced areas.

### 2.3.8.1 **Spoil Management Plan**

The total estimated volume of spoil to be managed following excavations during the construction phase of the Proposed Project is approximately 399,565 m<sup>3</sup>.

It is proposed to manage overburden generated through construction activities for the Proposed Project locally within the Site, through backfilling of the proposed borrow pits void in the first instance and following that within linear berms that will be placed along access roads and turbine hardstand areas, where appropriate (avoiding environmentally constrained areas). Excess overburden will also be placed around selected turbines bases and hardstands. The areas around 8 no. turbine bases and hardstands (12 no. individual areas proposed) have been assessed as suitable locations for spoil placement due to suitable ground conditions and slope angles. Excess overburden will be placed in three spoil management areas located within the Proposed Wind Farm site.

Some material arising from the construction of the Proposed Grid Connection underground cabling route will be sent to an appropriate licenced facility. There is more than enough capacity to manage the total volume of spoil requiring management for both the Proposed Wind Farm and the Proposed Grid Connection.

## 2.4 Detail on Development Components of the Proposed Grid Connection

The following sections will describe each of the development components of the Proposed Grid Connection Route within this planning application in further detail, in the following order:

- > *Onsite 110kV Substation*
- > *Wind Farm Control Building*
- > *Battery Storage*
- > *Underground Grid Connection Cabling Route*

Detailed site layout drawings of the Proposed Project are included in **Appendix 3** of this report.

### 2.4.1 Onsite 110kV Substation

It is proposed to construct a 110kV electricity substation within the Proposed Wind Farm site. The proposed onsite 110kV substation is located within agricultural pastoral land and will be accessed via the Proposed Wind Farm access roads.

The footprint of the proposed onsite 110kV substation compound measures approximately 26,550 m<sup>2</sup> in area and will include 2 no. control buildings and the electrical substation components necessary to consolidate the electrical energy generated by each wind turbine and export that electricity from the onsite 110kV substation to the national grid. The construction and exact layout of electrical equipment in the onsite 110kV substation will be to EirGrid Networks specifications.

The onsite 110kV substation compound will include steel palisade fencing (approximately 2.5 metre high or as otherwise required by EirGrid), and internal fences will also segregate different areas within the main substation. The onsite substation will remain in place as it will be under the ownership and control of EirGrid and will form a permanent part of the national electricity grid.

### 2.4.2 Wind Farm Control Building

Two wind farm control buildings will be located within the Proposed 110kV Substation compound. The Independent Power Provider (IPP) Control Building will measure 20.1 metres by 10.6 metres and 6.1 metres in height. The Eirgrid Control Building will measure 25 metres by 18 metre and 8.4 metres in height.

The wind farm control building will include staff welfare facilities for the staff that will work on the Proposed Project site during the operational phase of the project. Toilet facilities will be installed with a low-flush cistern and low-flow wash basin. Due to the specific nature of the Proposed Project, there will be a very small water requirement for occasional toilet flushing and hand washing and therefore the water requirement of the Proposed Project does not necessitate a potable source. It is proposed to either harvest rainwater from the roofs of the buildings or, alternatively, install a groundwater well adjacent to the substation in accordance with the Institute of Geologists Ireland, *Guide for Drilling Wells for Private Water Supplies* (IGI, 2007). The well will be flush to the ground and covered with a standard manhole. A pump house is not required as an in-well pump will direct water to a water tank within the roof space of the control building. Bottled water will be supplied for drinking, if required.

It is not proposed to treat wastewater on-site. Wastewater from the staff welfare facilities in the control buildings will be managed by means of a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants.

Such a proposal for managing the wastewater arising on site has become almost standard practice on wind farm sites, which are often proposed in areas where finding the necessary percolation requirements for on-site treatment would be challenging and has been accepted by numerous Planning Authorities and An Coimisiún Pleanála as an acceptable proposal.

The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. Full details of the proposed tank alarm system can be submitted to the Planning Authority in advance of any works commencing on-site. The wastewater storage tank alarm will be part of a continuous stream of data from the Proposed Wind Farm turbines, wind measurement devices and electricity substation that will be monitored remotely 24 hours a day, 7 days per week. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007(as amended), will be employed to transport wastewater away from the Proposed Project site.

### 2.4.3 Battery Storage

A battery-based energy storage system (BESS) will adjoin the 110kV onsite substation and is located adjacent to the substation compound. The battery storage compound will have a footprint of approximately 4,140m<sup>2</sup>. The battery storage compound will include 10 no. Battery Storage modules and 10 no. transformers. Each battery storage module will measure 12.2m X 2.4m with a height of 2.6m.

Prior to installing the steel containers, clearance of the site area, levelling off the ground surface and creation of a hard stand will be undertaken. These containers and the adjacent infrastructure house the batteries, inverters, transformers, fire suppression equipment and associated electrical components. The containers will be mounted onto concrete plinth foundations. The containers shall be spaced to allow airflow around the containers, feeding their climate control systems.

In addition to the modular steel containers, other components of the development include:

- › A grid transformer within the electrical compound;
- › Above ground cable junction boxes/ cabling cabinets and cable racks/steel trunking facilitating the necessary electrical connections between containers;
- › Underground ducting and cabling;
- › A security fence around the perimeter of the compound;
- › Communications equipment; and,
- › Lightning protection poles.

The battery storage compound will operate continuously, linked to the on-site substation. It will be monitored in tandem with the overall development and there will be sporadic maintenance visits as required. The battery energy storage system will remain in place as it will form a permanent part of the national electricity grid.

A Fire Risk Management and Emergency Response Plan has been prepared for the Proposed Project and is included as Appendix 4-4 of the accompanying EIAR.

### 2.4.4 Underground Grid Connection Cabling Route

A 110kV grid connection between the Proposed Wind Farm and the national electricity grid will be necessary to export electricity from the Proposed Wind Farm. It is proposed to connect the Proposed Carrow Wind Farm development to the national electricity grid via a 110kV underground electrical cabling connection to the existing 110kV Killonan substation, in the townland of Milltown, approximately 5.6km southeast of Limerick City, Co. Limerick. The underground electrical cabling route measures approximately 37.6km in length, the majority of which is located within the curtilage of the public road network.

The exact location of the grid connection cabling within the curtilage of the public road network may be subject to minor modification following confirmatory site investigations, to be undertaken prior to construction of the proposed wind farm development. A Road Opening Licence will be sought from the Roads Authority i.e. Tipperary County Council and Limerick County Council requiring all details to be confirmed before the licence is granted and work can commence.

The Proposed Grid Connection underground cabling route will originate at the proposed 110kV onsite substation, in the townland of Moheragh, Co. Tipperary, and run west for 0.9km along a Proposed Wind Farm site road, within the Proposed Wind Farm site road network, towards the L-1154 local road. The underground cabling route will then continue south along the L-1154 for approximately 1.0km before following the L-1155 southwest for 2.9km. The underground cabling route then follows the R505 Regional Road west for 0.3km before turning south for 0.6km on the R497. The underground cabling route will turn west onto the L-1156 local road for 6.8km. From here it will join the R505 in the townland of Toomaline Upper, Co Limerick and travel northwest for 14.6km. In the townland of Brittas, Co. Limerick the underground cabling route will leave the public road and travel west through agricultural pastoral land for 0.2km. Upon re-entering the public road corridor, the underground cabling route continues west on the L-5100 local road for 2.8km before turning south on the L-1132 local road for 0.3km. The underground cabling route will then continue west on the L-5101 local road for 1.9km. In the townland of Clognadromin, Co. Limerick the underground cabling route will leave the public road and travel west through agricultural pastoral land for 1.0km. Within the agricultural pastoral land, the underground cable will cross beneath the Killonan Junction to Limerick Junction railway line via horizontal direction drilling and continue south before rejoining the public road in the townland of Kishyquirk, Co. Limerick. The underground cabling route continues west on the L-5102 local road for 1.3km before joining the N24 National Primary Road in the townland of Clooncunna south, Co Limerick and travel northwest for 3.1km and turn left into the existing 110kV Killonan Substation compound in the townland of Milltown, Co. Limerick.

Detailed layout drawings are included in **Appendix 3** of this report.

#### 2.4.4.1 **Joint Bays**

Joint bays are typically pre-cast concrete chambers where lengths of cable will be joined to form one continuous cable. They will be located at various points along the ducting route generally between 500 to 800 metres intervals or as otherwise required by ESB/EirGrid and electrical requirements. Joint Bays are typically 2.5m x 6m x 1.75m pre-cast concrete structures installed below finished ground level.

Based on the separation distances outlined above, there are 58 no. joint bays proposed along the Proposed Grid Connection underground cabling route. There are no joint bays proposed within the Proposed Wind Farm access roads, 27 no. joint bays are proposed along the existing local road network, 22 no. joint bays are proposed along the regional roads, 5 no. joint bay is proposed along the N24 national road, and 4 no. joint bays are proposed within private agricultural fields.

In association with Joint Bays, Communication Chambers are required at every joint bay location to facilitate communication links between the onsite 110kV substation and the existing 110kV Killonan substation. Earth Sheath Link Chambers are also required approximately every second joint bay along the cable route. Earth Sheath Links are used for earthing and bonding cable sheaths of underground power cables, installed in a flat formation, so that the circulating currents and induced voltages are eliminated or reduced. Earth Sheath Link Chambers and Communication Chambers are located in close proximity to Joint Bays. Earth Sheath Link Chambers and Communication Chambers will be precast concrete structures with an access cover at finished surface level. The locations of the joint bays and chambers are shown on the site layout drawings included in **Appendix 3** of this report.

## 2.4.4.2 Watercourse and Service Crossings

There are 23 no. watercourse crossings, referenced on EPA/OSI mapping, located along the Proposed Grid Connection cabling route. The construction methodology for the 23 no. EPA/OSI mapped watercourse crossings has been designed to eliminate the requirement for in-stream works at these locations. The various crossing methodologies to be employed along the Proposed Grid Connection underground cabling route include the following:

- › Type A: Crossing using standard trefoil formation
- › Type B Flatbed formation under
- › Type C: Flatbed Formation over
- › Type D: Horizontal Directional Drilling

An additional 12 no. drainage crossing points were identified during surveys of the underground cable route. These culverts will be crossed using one of the above methodologies.

## 2.4.4.3 Underground Grid Connection Cabling Construction Methodologies

### 2.4.4.3.1 Underground Cabling Trench

The underground cabling works will consist of the installation of ducts in an excavated trench to accommodate power cables, and a fibre communications cables to allow communications between the proposed 110kV onsite substation and the existing 110kV Killonan substation.

The Proposed Grid Connection works will require a road opening licence under Section 254 of the Planning and Development Act 2000, as amended, from Tipperary County Council and Limerick County Council. A Traffic Management Plan (TMP) will be agreed with the local authority prior to the commencement of the development where required. The TMP will outline the location of traffic management signage, together with the location of any necessary road closures and the routing of appropriate diversions. Where diversions are required, these will be agreed with the local authority in advance of the works commencing.

The underground grid connection will be a single circuit connection consisting of 3 no. 110mm diameter HDPE power cable ducts and 1 no. 110mm diameter HDPE communications duct to be installed in an excavated trench, typically 825mm wide by 1,315mm deep. For trench designs there will be variations on the design to adapt to service crossings and watercourse crossings.

The underground electrical cabling will be laid beneath the surface of the Proposed Project site and the public road using the following methodology:

- › Before works commence, updated surveying will take place along the proposed cable route, with all existing culverts identified. All relevant bodies i.e. ESB, Uisce Éireann Tipperary County Council, Limerick County Council etc. will be contacted and all up to date drawings for all existing services sought.
- › When the cable is located on public roads, a traffic management plan will be prepared prior to any works commencing. A road opening licence will be obtained where required and all plant operators and general operatives will be inducted and informed as to the location of any services.
- › A tracked 360-degree excavator will then proceed to dig out the proposed trench, typically to a depth of 1315mm, within which the ducts will be laid.
- › The cable ducts will be concrete surrounded where they pass under the public road and under drains or culverts.

- › Trench supports will be installed, or the trench sides will be benched or battered back where appropriate and any ingress of ground water will be removed from the trench using submersible pumps, fitted with appropriate silt filtration systems, to prevent contamination of any watercourse.
- › Once the trench has been excavated, a base-layer will be laid and compacted, comprising Clause 804, or 15 Newton CBM4 concrete as required.
- › The ducting will be installed as per specification, with couplers fitted and capped to prevent any dirt etc. entering the duct. In poor ground conditions, the ends of the ducts will be shimmed up off of the bed of the trench, to prevent any possible ingress of water dirt. The shims will be removed again once the next length has been connected. Extreme care will be taken to ensure that all duct collars (both ends) are clean and in good condition prior to ducts being joined.
- › As the works progress, the as-built location of the ducting will be recorded using a total station or GPS.
- › As per the associated base-layer (Clause 804 material or 15 Newton CBM4 concrete) will be installed and compacted as per approved detail, with care not to displace the ducting.
- › Spacers will be used to ensure that the correct cover is achieved at both sides of the ducting.
- › The remainder of the trench will be backfilled in two compacted layers with approved engineer's specified material.
- › Yellow marker warning tape will be installed across the width of the trench, at 300mm depth,
- › The finished surface is to be reinstated, as per original specification. Off-road cabling may be finished with granular fill to facilitate access to the trench for any potential maintenance that is required during the operational phase of the Proposed Project.

Marker posts will then be placed at regular intervals (generally at joint bays and any change in direction) to denote the location of the underground power cables.

#### 2.4.4.3.2 **Underground Cable Watercourse Crossing**

There is 23 no. identified EPA/OSI mapped watercourse, along the Proposed Grid Connection underground electrical cabling route.

The directional drilling construction methodology for this crossing has been designed to eliminate the requirement for in-stream works or the construction of any clearspan crossing structure at this location.

## 2.5 **Access and Transportation**

### 2.5.1 **Site Entrances**

#### **Main Site Entrance**

During the construction phase, the Proposed Wind Farm site will be accessed via an existing agricultural access point off the L-1154 local road. The L-1154 runs along the south western boundary of the Proposed Wind Farm site in the townland of Moheragh, Co. Tipperary. This entrance will be upgraded and will be used as the main site entrance for HGVs and other abnormal loads during the construction phase of the Proposed Wind Farm. For the purposes of delivering large turbine components and other abnormal loads to the Proposed Wind Farm site, a temporary abnormal load site entrance is proposed approximately 90m south of the main site entrance. During the construction phase, this entrance will closed off outside of abnormal load delivery periods. The existing boundary along the L-1154 will be reinstated upon commissioning of the Proposed Wind Farm.

It is also proposed to access the onsite 110kV substation, during both the construction and operational phases of the Proposed Wind Farm, via this entrance.

The location of Proposed Wind Farm main site entrance and temporary abnormal load site entrance is shown in **Appendix 3** of this report.

### Access and Egress Points

The Proposed Wind Farm site is traversed by a number of existing public roads and forestry/farm tracks. It is proposed to utilise 5 no. existing access/egress points and construct 11 no. new access/egress points at various locations across the site. These access and egress will be used throughout the construction, operation, and decommissioning phases of the Proposed Wind Farm site to facilitate the movement of HGVs, abnormal load delivery vehicles, and operation and maintenance vehicles to and from the various turbine locations within the site.

## 2.5.2 Turbine Delivery Route

It is envisaged that large wind turbine components will be delivered to the Proposed Wind Farm site, from the Port of Cork (Ringaskiddy) (other ports such as Galway Port, Shannon Foynes or Dublin Port could also be used), via the N28 and N40 national primary road, the M8 Motorway, N74 National Secondary Road, R639 and R505 regional roads followed by the L1291, L1283, L1282 and L1154 local roads. The proposed turbine delivery route (TDR) from the M8 to the Proposed Wind Farm site is shown on Figure 15-1a.

From the Port of Cork (Ringaskiddy), the turbine component delivery vehicles will travel north via the N28 and N40 National Primary Roads before merging onto the M8 Motorway. At Junction 9 (Cashel), the vehicles will exit the M8 and travel north for approximately 2km on the N74 National Secondary Road and the R639/R505 through Cashel, Co Tipperary. From Cashel the turbine component delivery vehicles will travel north for approximately 13.3km on the R505 to the village of Dundrum, Co. Tipperary. From here the turbine component delivery vehicles will travel north on the L1291 local road or approximately 2km to Gortussa Cross in the townland of Gortussa, Co. Tipperary, the turbine delivery vehicles will then travel northeast on the L1283 local road for approximately 3km, before turning left into agricultural land in the townland of Carrow in Co. Tipperary. The turbine delivery vehicles will travel north for approximately 0.3km through the agricultural land, through which a proposed temporary access track will be constructed. The vehicles will then head west for approximately 4.1km on the L1282 local road to the L1282/L1154 junction in the townland of Scarrough, Co. Tipperary. The turbine delivery vehicles will turn north and travel for approximately 0.9km on the L1154 to the Proposed Wind Farm site entrance.

### 3. CHARACTERISTICS OF THE RECEIVING ENVIRONMENT

#### 3.1 Hydrology

##### 3.1.1 Regional and Local Hydrology

Regionally, the Proposed Wind Farm site is located entirely within the River Suir catchment and more locally within the Multeen River surface water catchment within Hydrometric Area No. 16 of the South Eastern River Basin District).

More locally, the Proposed Wind Farm site is mapped to lie within 2 no. surface water sub-catchments. The western portion of the Proposed Wind Farm site is located in the Suir\_SC\_060 sub-catchment and more locally within the Multeen\_010, Multeen\_020 and Multeen\_030 river sub-basins. All Proposed Wind Farm infrastructure is located in the Multeen\_020 sub-basin.

The eastern portion of the Proposed Wind Farm site is mapped within the Multeen[East]\_SC\_010 sub-catchment and more locally within the Aughnaglanny\_010 and Multeen (East)\_030 sub-basin. All Proposed Wind Farm infrastructure is located in the Aughnaglanny\_010 sub-basin.

The Multeen River discharges into the River Suir approximately 20km downstream of the Proposed Wind Farm site.

Regionally, the Proposed Grid Connection is located in the River Suir catchment and the River Shannon catchment. Within the River Suir catchment approximately 5.3km of the cable route and the 110kV substation are located in the Multeen River surface water sub-catchment within the Multeen\_020 sub-basin.

Within the River Shannon catchment, the cable route is located in the Mulkear River sub-catchment (24km) and the Groody River catchment (8.3km).

The TDR works are located in the Multeen(East)\_SC\_010 and Suir SC\_060 sub-catchments.



## 3.2 Results of Baseline Ecological Surveys

### 3.2.1 Descriptions of Habitats and Flora within the Proposed Wind Farm site

This section describes the habitats recorded within the Proposed Wind Farm site with associated Plates representative of the main habitats present. The majority of the Proposed Wind Farm site is located in an area dominated by commercial forestry and agriculture.

A total of seventeen habitats, classified in accordance with Fossitt (2000), were recorded within the Proposed Wind Farm site and are listed in Table 3-1 below.

*Table 3-1 Habitats recorded within the Proposed Wind Farm site.*

Habitat Name	Fossitt Code
Conifer plantation	WD4
Improved agricultural grassland	GA1
Wet grassland	GS4
Improved agricultural grassland	GA1
Mixed broadleaved/ conifer woodland	WD2
Wet willow-alder-ash woodland	WN6
Buildings and artificial surfaces	BL3
Scrub	WS1
Dense bracken	HD1
Wet heath	HH3
Hedgerows	WL1
Treelines	WL2
Stone walls and other stonework	BL1
Recolonising bare ground	ED3
Dry meadows and grassy verges	GS2
Eroding/ upland rivers	FW1
Depositing/ lowland rivers	FW2

#### Improved agricultural grassland (GA1)

Several of the lands within the Proposed Wind Farm site were characterised as **Improved agricultural grassland (GA1)** pasture (Plate 3-1). These were generally found along the south, west and north-east portions of the Proposed Wind Farm site. The sward within most fields of this nature was dominated by perennial rye grass (*Lolium perenne*) with frequent occurrences of Yorkshire Fog (*Holcus lanatus*), creeping buttercup (*Ranunculus repens*), meadow buttercup (*Ranunculus acris*), dandelion (*Taraxacum officinale agg.*), red clover (*Trifolium pratense*), white clover (*Trifolium repens*), broad-leaved dock (*Rumex obtusifolius*), and spear thistle (*Cirsium vulgare*). These areas of grassland are under agricultural management, used for silage and grazed by livestock. Turbine 9 (and associated infrastructure) is located within Improved agricultural grassland (GA1) habitat.



Plate 3-1 Example of Improved agricultural grassland (GA1) in the vicinity of Turbine 9, in the northwestern portion of the Proposed Wind Farm site.

### Wet Grassland (GS4)

Areas of **Wet grassland (GS4)** were recorded within and bordering fields of **Improved agricultural grassland (GA1)** throughout the Proposed Wind Farm site (Plate 3-2). Wet grassland (GS4) habitat was generally dominated by rushes, in particular soft rush (*Juncus effusus*), jointed rush (*Juncus articulatus*), and sharp-flowered rush (*Juncus acutiflorus*). Yorkshire-fog (*Holcus lanatus*), common bent grass (*Agrostis capillaris*), and creeping buttercup (*Ranunculus repens*) were also abundant. Other herbaceous and grass species that occurred frequently included perennial ryegrass (*Lolium perenne*), meadow buttercup (*Ranunculus acris*), sweet vernal grass (*Anthoxanthum odoratum*), common sorrel (*Rumex acetosa*), red fescue (*Festuca rubra*), hoary willowherb (*Epilobium parviflorum*), marsh thistle (*Cirsium palustre*), false oat grass (*Arrhenatherum elatius*), clover (*Trifolium* sp.), common ragwort (*Jacobaea vulgaris*) and gorse (*Ulex europaeus*).

Two relevés were carried out in representative areas of the above Wet grassland (GS4) habitat and were analysed in accordance with the Irish Vegetation Classification (IVC) system. The Engine for Relevés to Irish Communities Assignment (ERICA) assigned the surveyed areas as communities of GL2B *Juncus effusus* - *Holcus lanatus*. These communities, as per the IVC community classification, are not considered to have affinity with Annex I listed habitats.

The Proposed substation, Turbine 1, Turbine 14, and the proposed access road to Turbine 3 are partially located within Wet grassland (GS4) habitat. Grazing by cattle or horses was noted during the surveys in some Wet grassland (GS4) areas.



Plate 3-2 Wet grassland (GS4) habitat in the southeast area of the Proposed Wind Farm site, showing vegetation dominated by *Juncus effusus*, *Juncus acutiflorus*, and *Ranunculus repens*. This grassland is bordered by Conifer plantation (WD4) to the west, extended Improved agricultural grassland (GA1) habitat to the north.

Wet grassland (GS4) habitat located adjacent to Turbine 3 (Plate 3-3) and Turbine 4 was characterised by a dominant cover of rushes, in particular soft rush (*Juncus effusus*), hard rush (*Juncus inflexus*), sharp-flowered rush (*Juncus acutiflorus*), jointed rush (*Juncus articulatus*), tormentil (*Potentilla erecta*), devil's bit scabious (*Succisa pratensis*), star sedge (*Carex echinata*), carnation sedge (*Carex panacea*), purple moor-grass (*Molinia caerulea*), ragged robin (*Silene flos-cuculi*), field forget-me-not (*Myosotis arvensis*), marsh cinquefoil (*Comarum palustre*), water mint (*Mentha aquatica*), common knapweed (*Centaurea nigra*), compact rush (*Juncus conglomeratus*), field wood rush (*Luzula campestris*), heath grass (*Danthonia decumbens*), common sedge (*Carex nigra*) as well as Yorkshire-fog (*Holcus lanatus*), common bent grass (*Agrostis capillaris*), and creeping buttercup (*Ranunculus repens*). Occasional herbaceous and grass species recorded in this habitat included meadow buttercup (*Ranunculus acris*), sweet vernal grass (*Anthoxanthum odoratum*), common sorrel (*Rumex acetosa*), red fescue (*Festuca rubra*), and meadow thistle (*Cirsium dissectum*).

Two relevés were carried out in representative areas of the above species rich Wet grassland (GS4) habitat and were analysed in accordance the Irish Vegetation Classification (IVC) system. The Engine for Relevés to Irish Communities Assignment (ERICA) assigned the surveyed areas as communities of GL2B *Juncus effusus* - *Holcus lanatus*.

This section of Wet grassland (GS4) habitat conformed to Annex I *Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)* and supported marsh fritillary (Section 6.4.2.3 of Chapter 6 of the EIAR). As per Martin et al. (2018), to conform to this Annex I habitat, there is a requirement for  $\geq 7$  indicator species, or  $\geq$  high quality indicator species to be identified within the relevés. Indicators species of this Annex I habitat recorded, as set out in Martin et al. (2018), included tormentil, devil's bit scabious, star sedge, carnation sedge, purple moor-grass, water mint, sharp-flowered rush, jointed rush, and common sedge. High quality indicator species recorded included

compact rush.



Plate 3-3 Annex I conforming habitat adjacent to Turbine 3 which contained devils-bit scabious which is suitable supporting habitat for marsh fritillary.

### Wet heath (HH3)

Marginal **Wet heath (HH3)** habitat was present throughout the Proposed Wind Farm site, primarily bordering forestry tracks adjacent to conifer plantation, as well as bordering **Wet grassland (GS4)** habitat as indicated in Plate 3-4. Instances of this habitat recorded within the Proposed Wind Farm site were often degraded due to encroaching scrub, and contained occasional ling heather (*Calluna vulgaris*), bilberry (*Vaccinium myrtillus*) and bell heather (*Erica cinerea*), but were heavily dominated by purple moor grass (*Molinia caerulea*). Encroaching bramble and gorse, as well as willow saplings and Sitka spruce saplings, were recorded throughout this habitat.



Plate 3-4 Example of degraded wet heath habitat in close proximity to Turbine 5.

#### Conifer Plantation (WD4)

**Conifer plantation (WD4)** habitat (Plate 3-5 and Plate 3-6) dominated several portions of the Proposed Wind Farm site. Conifer plantation occurs within the central southern half of the Proposed Wind Farm site, extending through the greater central vicinity and spanning the majority of the northern portion of the Proposed Wind Farm site. These forestry blocks were dominated by *Picea* species with ground cover flora dominated by bryophyte species, including *Sphagnum* moss, as well as occasional bramble, fern species, bracken fern (*Pteridium aquilinum*), soft rush (*Juncus effuses*), horsetail (*Equisetum*) species, and Foxglove (*Digitalis purpurea*).

Mature and sapling Willow species (*Salix* spp.) predominantly occurred along the boundaries of conifer stands, with other mature broadleaf species including ash (*Fraxinus excelsior*) and sycamore (*Acer pseudoplatanus*) also present. Moderate Ivy (*Hedera helix*) cover occurred on the trunks of mature broadleaf trees.



Plate 3-5 Example of Conifer plantation (WD4) habitat, dominated by Picea species, in the south of the Proposed Wind Farm site.



Plate 3-6 Example of bryophyte-dominant woodland floor cover within conifer plantation (WD4) habitat.

### Mixed broadleaved/ conifer woodland (WD2)/ Dense Bracken (HD1)

A large area of **Mixed broadleaved/conifer woodland (WD2)** (Plate 3-7) habitat was recorded within the north-western portion of the Proposed Wind Farm site, where the proposed new road infrastructure crosses this habitat between Turbine 8 and Turbine 5. This woodland consists of a mosaic of species including two large areas of **Dense bracken (HD1)** along with frequent to occasional gorse (*Ulex europaeus*), willow (*Salix* spp.), rowan (*Sorbus aucuparia*), Sitka spruce (*Picea sitchensis*) and sycamore (*Acer pseudoplatanus*).



Plate 3-7 Example of Mixed broadleaved/ conifer (WD2) woodland habitat east of T07.

### Scrub (WS1)

Several areas of **Scrub (WS1)** (Plate 3-8) were recorded within the Proposed Wind Farm site, including within the proposed location of Turbine 7, and the proposed new road infrastructure accessing the proposed borrow pit. Scrub occurred in areas of previously felled woodland, with a diversity of herbaceous species including frequent bramble (*Rubus fruticosus*), willow (*Salix* sp.), and soft rush (*Juncus effuses*) and occasional common heather (*Calluna vulgaris*), heath bedstraw (*Galium saxatile*), rosebay willowherb (*Chamaenerion angustifolium*) and tormentil (*Potentilla erecta*). Moss species, spinulose wood fern (*Dryopteris carthusiana*), gorse (*Ulex europaeus*), spruce species, spruce saplings and grasses were also recorded to a lesser extent, as was occasional patches of bare earth.



Plate 38 Example of Scrub (WS1) habitat showing vegetation of soft rush, willow, and spruce saplings, establishing in an area of previously felled woodland around Turbine 2, east of the Proposed Wind Farm site.

#### Wet willow-alder-ash woodland (WN6)

A large area of **Wet willow-alder-ash woodland (WN6)** habitat (Plate 3-9) was recorded in the north central part of the Proposed Wind Farm site along with small areas recorded along boundaries of **Conifer plantation (WD4)** along the west and north-east. The canopy of this woodland was low and was dominated by willow (*Salix* spp.) with an understory of dominant to frequent gorse (*Ulex europaeus*), bramble (*Rubus fruticosus* agg.) and sycamore (*Acer pseudoplatanus*) saplings.

Whilst this Fossitt habitat can conform to the Annex I habitat: Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-padion*, *Alnion incanae*, *Salicion albae*) (91E0), given the typically willow dominant and low diversity canopy, the lack of positive indicators as set out in Daly et al. (2023), as well as the thick understory of scrub species, this woodland habitat does not conform to any Annex I woodland habitat.

This habitat was recorded within the proposed location for Turbine 5 within the central portion of the Proposed Wind Farm site which is bordered by **Conifer plantation (WD4)** and **Wet grassland (GS4)**.



Plate 3-9 Example of Wet willow-alder-ash woodland (WN6) within the Proposed Wind Farm site.

### Hedgerows (WL1)

An extensive network of hedgerows (Plate 3-11) occurs within the Proposed Wind Farm site, forming boundaries around agricultural fields and bordering existing roads. Field boundary hedgerows were primarily dominated by hawthorn (*Crataegus monogyna*), gorse (*Ulex europaeus*) and bramble (*Rubus fruticosus agg.*). Other species recorded frequently in hedgerow habitat within the Proposed Wind Farm site included blackthorn (*Prunus spinosa*), ash (*Fraxinus excelsior*), and holly (*Ilex aquifolium*).



Plate 3-10 West-facing view of Hedgerow (WL1) habitat bordering pastures and Conifer plantations (WD4) located on the northwestern portion of the Proposed Wind Farm site.

### Treelines (WL2)

Where linear ‘hedgerow’ features were over 5m in height and were made up of semi-mature to mature trees, these were categorised as **Treelines (WL2)** in line with Fossitt (2000). *Picea* species and *Salix* species were the dominant species in treeline habitat within the Proposed Wind Farm site (Plate 3-12 and Plate 3-13). An understory of unmanaged common species such as hawthorn (*Crataegus monogyna*), ivy (*Hedera helix*), and bramble (*Rubus fruticosus agg.*) was occasionally noted, particularly where commercial conifer stands were not directly adjacent.



Plate 3-11 Conifer Treeline (WL2) along a field boundary separating agricultural grasslands, located in the southwestern portion of the Proposed Wind Farm site and within a proposed borrow pit location.



Plate 3-12 A mixed conifer (*Picea* spp.) and deciduous (*Fraxinus excelsior*) Treeline (WL2) with an understory predominantly consisting of bramble (*Rubus* spp.) and gorse (*Ulex europaeus*) bordering an Improved agricultural grassland (GA1) in the north-centre area of the Proposed Wind Farm site at a proposed road between Turbine 5 and Turbine 8.

### Recolonising bare ground (ED3)

Existing forestry roads within the Proposed Wind Farm site were categorised as **Recolonising bare ground (ED3)** (Plate 3-14). Species recolonising these areas included a frequent cover of bramble (*Rubus fruticosus* agg.), gorse (*Ulex europaeus*), grey willow (*Salix cinerea*), fireweed (*Chamaenerion angustifolium*), *Sphagnum* moss, common bent grass (*Agrostis capillaris*), marsh thistle (*Cirsium palustre*), and soft rush (*Juncus effusus*). This habitat also contained an occasional to rare cover of coltsfoot (*Tussilago farfara*), tufted hair grass (*Deschampsia cespitosa*), eyebright (*Euphrasia officinalis*), little robin (*Geranium purpureum*), oxeye daisy (*Leucanthemum vulgare*), club moss, and common butterwort (*Pinguicula vulgaris*). Rare occurrences of ling heather (*Calluna vulgaris*) and bell heather (*Erica cinerea*) were present on the edge of the forestry roads bordering conifer plantation.



Plate 3-13 example of Recolonising bare ground (ED3) habitat within the Proposed Wind Farm site.

### Eroding/ upland rivers (FW1)

Three watercourses drain the eastern, southern and western sections of the Proposed Wind Farm site.

The Lackenacombe River (EPA code: 16L73) originates in the northern section of the Proposed Wind Farm site and along with several tributaries, flows in a westerly direction (Plate 3-15 and Plate 3-16). This watercourse flows through native woodlands and agricultural grassland, and presented as a typical upland stream, with sections of small glides, riffles, and pools. Typical stream width was 0.8m and approximately 0.10m deep, with a cobble/gravel substrate.

The Scarrough River (EPA code: 16S38) originates in the east of the Proposed Wind Farm site and along with two tributaries, flows in a westerly direction (Plate 3-17). The upper reaches of this watercourse flow through maturing forestry, with the lower reaches within the Site flowing through agricultural grasslands. This watercourse was heavily modified, and presented a moderate flowing,

channelised drain. Typical stream width was 0.5m and approximately 0.10m deep, with a cobble/gravel substrate.

The Upper Genough River (EPA code: 16U16) originates in the northeast of the Site, and two tributaries originate in the northeast and southeast area of the site (Plate 3-18). The Upper Genough River flows through agricultural pasture and conifer plantation. Within the conifer plantation, the stream comprises a channelised narrow watercourse with steep high banks. Bankside vegetation cover extended along the channel and consisted of moss species cover, with dense overhanging vegetation of *Picea* saplings, bramble (*Rubus fruticosus* agg.), fireweed (*Chamaenerion angustifolium*) and other herbaceous species.



*Plate 3-14 Example of the Lackenacoombe Eroding/ upland river (FWI) habitat within native woodland in the Proposed Wind Farm site.*



*Plate 3-15 Example of the Lackenacoombe Eroding/ upland river (FWI) habitat within the Proposed Wind Farm site.*



*Plate 3-16 Example of the Scarrough Eroding/ upland river (FWI) habitat within the southern section of the Proposed Wind Farm site*



*Plate 3-17 Example of the Upper Genough Eroding/ upland river (FWI) habitat within the eastern section of the Proposed Wind Farm site.*

## Habitats and Flora along the Proposed Grid Connection Route

The Proposed Grid Connection underground cabling route between the Proposed Wind Farm and the national electricity grid will be necessary to export electricity from the Proposed Wind Farm. It is proposed to connect the Proposed Carrow Wind Farm development to the national electricity grid via a 110kV underground electrical cabling connection to the existing 110 kV Killonan substation, in the townland of Milltown, southeast of Limerick City, Co. Limerick. The underground electrical cabling route measures approximately 38 km in length the majority of which is located within the curtilage of the public road network. The Proposed Grid Connection underground cabling route will exit the wind farm site to the west and will be lain entirely within a combination existing road infrastructure and agricultural fields.

The Proposed Grid Connection underground cabling route will predominantly follow existing roads classified as **Buildings and artificial surfaces (BL3)** (Plate 3-18). The Proposed Grid Connection underground cabling route will also cross fields classified as **Improved agricultural grassland (GA1)** on occasion (Plate 3-19).

Habitats recorded adjacent to the Proposed Grid Connection Route included typical verge habitats such as **Dry meadows and grassy verges (GS2)**, **Hedgerows (WL1)**, **Treelines (WL2)**, **Improved agricultural grassland (GA1)**, **Stonewalls and other stonework (BL1)**, **Mixed broadleaved woodland (WD1)** and **Buildings and artificial surfaces (BL3)**.

The Proposed Grid Connection underground cabling route is composed of 23 crossing sites located across two hydrological catchments and six hydrological sub-catchments. These included **Depositing/lowland rivers (FW2)** (Plate 3-20) and **Eroding/upland rivers (FW1)** (Plate 3-21). Smaller watercourses were typically highly vegetated banks, comprised of scrub and treeline species such as bramble, willow, sycamore, and alder.

Full details on watercourses along the Proposed Grid Connection underground cabling route are provided in **Appendix 2**.



*Plate 3-18 Existing roadway corridor classified as Buildings and Artificial surfaces (BL3) with Grassy verges (GS2) and Hedgerows (WL1).*



*Plate 3-19 Example of Improved agricultural grassland habitat (GA1) and Hedgerow (WL1) habitat along the Proposed Grid Connection Route.*



Plate 3-20 Example of Depositing/ lowland rivers (FW2) along the Proposed Grid Connection route.



Plate 3-21 Example of Eroding/ upland rivers (FW1).

### 3.2.3 Habitats and Flora along Turbine Delivery Route

It is envisaged that large wind turbine components will be delivered to the Proposed Wind Farm site, from the Port of Cork (Ringaskiddy) (other ports such as Galway Port, Shannon Foynes or Dublin Port could also be used), via the N28 and N40 national primary road, the M8 Motorway, N74 National Secondary Road, R639 and R505 regional roads followed by the L1291, L1283, L1282 and L1154 local roads.

The current proposed Turbine Delivery Route (TDR) for the Proposed Wind Farm is predominantly located within existing public road infrastructure. The TDR will travel along the road network to the southeast of the Proposed Wind Farm site.

Where temporary accommodation works are required along the proposed TDR, these points are delineated by similar habitat to that of the Proposed Grid Connection underground cabling route which predominantly contains **Buildings and artificial surfaces (BL3)**, **Dry meadows and grassy verges (GS2)**, **Hedgerows (WL1)**, **Treelines (WL2)**, and **upland/eroding rivers (FW1)**, and bordered by agricultural grasslands and amenity grasslands.

Hedgerow habitat was dominated by bramble (*Rubus fruticosus agg*), and contained occasional occurrences of bracken, snowberry (*Symphoricarpos albus*), and willowherb (*Epilobium hirsutum*) (Plate 3-22). Common species recorded within Treeline habitat included sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), oak (*Quercus robur*), birch (*Betula sp.*) and beech (*Fagus sylvatica*) (Plate 3-23).



Plate 3-22 Example of Hedgerow habitat along the proposed Turbine Delivery Route.



Plate 3-23 Example of Treeline habitat along the proposed Turbine Delivery Route.

### 3.2.4 Otter Surveys

Watercourses throughout the vicinity of the Proposed Wind Farm and along the Proposed Grid Connection underground cabling route and proposed TDR were surveyed for signs of otter, including spraint, prints, trails, holts and couches.

No otter resting or breeding sites were recorded during the surveys undertaken for both the Proposed Wind Farm site and Proposed Grid Connection.

Otter prints were identified at one survey location along the Proposed Grid Connection underground cabling route (ITM X 572184, Y 650798). No holts were identified 150m upstream or downstream of the bridge crossing at this location (GC 28) at the time of survey, although the Mulkear River provided high quality commuting and foraging habitat for otter at this location. Further details are provided in **Appendix 2**.

Although no otter resting or breeding sites were recorded within the Site, the site lies within the foraging range of otter, which is a Qualifying Interest of both Lower River Suir SAC and Lower River Shannon SAC and are likely to frequent the Site, at least on occasion.

### 3.2.5 Aquatic Surveys

Watercourses surveyed within the vicinity of the Proposed Wind Farm site consisted of *Eroding/Upland Rivers (FWI)*, with upland, headwater rivers profiles at various survey locations. The Site also contained wider, lowland stretches of watercourse, with varying degree of modification but overall high fisheries potential.

Q-value scores calculated for the survey sites in the vicinity of the wind farm ranged from Q2-3 – Poor to Q3-4 –Moderate, Q4 –Good and Q4-5 – High.

There were no positive results for freshwater pearl mussel or crayfish plague eDNA at any of the wind farm survey locations. Positive results for white-clawed crayfish eDNA were found at sites WF 8 (6/12 replicates) and WF 16 (3/12 replicates) indicated the presence of this species at or upstream of these locations.

No kingfisher was observed utilising the watercourses in the vicinity of the Proposed Wind Farm survey sites, with no kingfisher burrows identified at any of the survey locations at the time of survey.

Watercourses surveyed along the Proposed Killonan Grid Connection Route consisted of stretches of both *Eroding/Upland River (FW1)* and *Depositing/Lowland River (FW2)*, with varying degrees of modification. Q-value scores calculated for the survey sites ranged from Q2-3 – Poor to Q3-4 – Moderate.

Five sites along the Proposed Grid Connection underground cabling route offered the highest quality potential fisheries habitat along the grid connection route, as well as the best potential commuting and foraging habitat for otter. No otter signs, holts or couches were identified along the Proposed Grid Connection underground cabling route at the time of survey, with the exception of otter prints identified at GC 28.

The locations, methodologies and results of all aquatic surveys undertaken for the Proposed Project are included in the Aquatic Baseline Report provided in **Appendix 2**.

### 3.2.6 Invasive Species

During field surveys, a search for Invasive Alien Species (IAS) listed under the ‘Third Schedule’ of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) and the ‘First Schedule’ of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 374 of 2024) was conducted.

Four species, included on the aforementioned Schedules, were recorded; Giant Hogweed (*Heracleum mantegazzianum*) was recorded at three locations along the Proposed Grid Connection underground cabling route. Rhododendron (*Rhododendron ponticum*) was recorded at one location along the Proposed Grid Connection underground cabling route in addition to one location along the proposed TDR, although not within an area of the proposed accommodation works. Japanese knotweed (*Reynoutria japonica*) and Giant knotweed (*Reynoutria sachalinensis*) were recorded within the Proposed Wind Farm site approximately 45m and 220m respectfully from the hardstand of Turbine 8. Another stand of Japanese knotweed was recorded approximately 275m from the hardstand of Turbine 5.

Full details of all scheduled invasive species recorded during the surveys, with locations, are provided in the Invasive Species Management Plan (ISMP) in **Appendix 4**.

### 3.2.7 Bird Surveys

Bird species recorded during the multidisciplinary walkover surveys, of both the Proposed Wind Farm site and the Proposed Grid Connection Route, were typically an assemblage of common species typical of agricultural and rural environments.

Regards European Sites, the Proposed Wind Farm site is located within the maximum foraging range of one SCI species of surrounding Special Areas of Protection (SPAs) (SNH, 2016), including the following designated as part of the Slievefelim to Silvermines Mountains SPA:

- › Hen harrier (*Circus cyaneus*)

During the targeted bird surveys undertaken, there were six individual observations of hen harrier during vantage point surveys within the Proposed Wind Farm site. Additionally, hen harrier was recorded on one occasion during both the breeding walkover and breeding raptor surveys, and there were two observations of hen harrier during the hen harrier roost surveys.

There was no evidence of hen harrier breeding at the Proposed Wind Farm site during surveys and no regularly used hen harrier roosts were identified. It was therefore determined that the Proposed Wind Farm site is not of significance to hen harrier populations associated with Slievefelim to Silvermines

Mountains SPA, given how infrequently the Proposed Wind Farm site is utilised by this species, and that the habitats on-site are sub-optimal compared to the surrounding landscape.

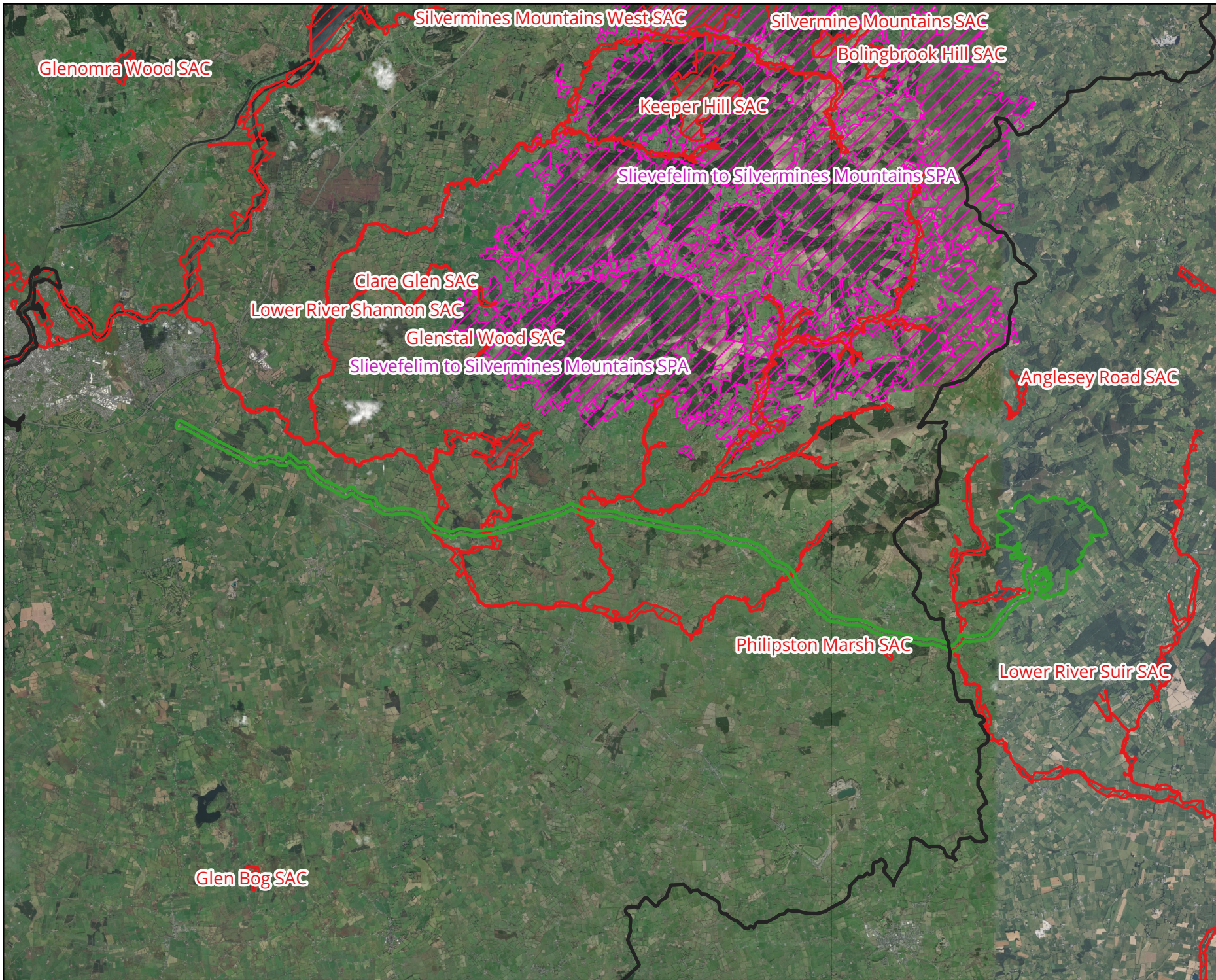
The Proposed Grid Connection Route is dominated by existing road infrastructure which does not provide significant supporting habitat for any SCI associated with nearby European Sites. However, it was observed that adjacent habitats, such as agricultural fields particularly along the western section of the route, provided potential high tide roosting/foraging habitat for multiple SCIs of the River Shannon and River Fergus Estuaries SPA. Whilst no SCIs of this SPA were recorded along the Proposed Grid Connection Route during the surveys undertaken, given the suitability of adjacent lands, it is likely that they support SCIs of the SPA, at least on occasion.

## 4. STAGE 1 - APPROPRIATE ASSESSMENT SCREENING


### 4.1 Identification of Relevant European Sites

The following methodology was used to establish any European Sites upon which there is a potential for a likely significant effect to occur either individually or in combination with other plans and projects as a result of the Proposed Project:

- › Initially the most up to date GIS spatial datasets for European designated sites and water catchments were downloaded from the NPWS website ([www.npws.ie](http://www.npws.ie)) and the EPA website ([www.epa.ie](http://www.epa.ie)).
- › All European Sites that could potentially be affected were identified using a source-pathway - receptor model. To provide context for the assessment, European Sites surrounding the Proposed Project are shown on Figure 4-1. Information on these sites according to the site-specific conservation objectives is provided in Table 4-1.
- › The catchment mapping was used to establish or discount potential hydrological connectivity between the Site and any European Sites. The hydrological catchments are also shown in Figure 4-1.
- › In relation to Special Protection Areas, in the absence of any specific European or Irish guidance in relation to such sites, the Scottish Natural Heritage (SNH) Guidance, '*Assessing Connectivity with Special Protection Areas (SPA)*' (2016) was consulted. This document provides guidance in relation to the identification of connectivity between Proposed Project and Special Protection Areas. The guidance takes into consideration the distances species may travel beyond the boundary of their SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects.
- › Table 4-1 provides details of all relevant European Sites as identified in the preceding steps and assesses the potential for likely significant effects on each.
- › The assessment considers any likely direct or indirect impacts of the Proposed Project, both alone and in combination with other plans and projects, on European Sites by virtue of criteria including the following: size and scale, land-take, distance from the European Site or key features of the site, resource requirements, emissions, excavation requirements, transportation requirements and duration of construction, operation and decommissioning were considered in this assessment.
- › The site synopses and conservation objectives of these sites, as per the NPWS website ([www.npws.ie](http://www.npws.ie)), were consulted and reviewed at the time of preparing this report.
- › Where potential pathways for Likely Significant Effect are identified, the site is included within the Likely Zone of Influence and further assessment is required within the NIS.
- › The potential for the Proposed Project to result in cumulative impacts on any European Sites in combination with other plans and projects was considered in the assessment that is presented in Table 4-1. Plans and projects considered include those that are listed in **Appendix 5**.



**Map Legend**

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



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Drawing Title  
European Designated Sites surrounding the site of the Proposed Project

Project Title  
**Carrow Wind Farm**

Drawn By <b>SC</b>	Checked By <b>PD</b>
Project No. <b>231102</b>	Drawing No. <b>Figure 4-1</b>
Scale <b>1:180,000</b>	Date <b>08.12.2025</b>



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Table 4-1 Identification of European Sites within the Likely Zone of Influence.

European Sites and distance from Proposed Project	Qualifying Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie <sup>8</sup> on the 20/11/2025)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
<b>Special Areas of Conservation (SAC)</b>				
<b>Lower River Suir SAC (002137)</b>  Approx. distance from Proposed Wind Farm site <b>300 m</b>  Approx. distance from Proposed Grid Connection route: <b>0 km</b>  Approx. Hydrological Distance from the Site <b>0 km</b>	<ul style="list-style-type: none"> <li>&gt; [1330] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)</li> <li>&gt; [1410] Mediterranean salt meadows (<i>Juncetalia maritimi</i>)</li> <li>&gt; [3260] Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation</li> <li>&gt; [6430] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels</li> <li>&gt; [91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles</li> <li>&gt; Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)</li> <li>&gt; [91J0] <i>Taxus baccata</i> woods of the British Isles</li> <li>&gt; [1029] Freshwater Pearl Mussel <i>Margaritifera margaritifera</i></li> <li>&gt; [1092] White-clawed Crayfish <i>Austropotamobius pallipes</i></li> <li>&gt; [1095] Sea Lamprey <i>Petromyzon marinus</i></li> <li>&gt; [1096] Brook Lamprey <i>Lampetra planeri</i></li> <li>&gt; [1099] River Lamprey <i>Lampetra fluviatilis</i></li> </ul>	Detailed conservation objectives for this site (Version 1, March 2017, were reviewed as part of the assessment and are available at:  <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002137.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002137.pdf</a>	<p>There is potential for direct effects due to the Proposed Grid Connection underground cabling route component of the Proposed Project overlapping with portions of this SAC.</p> <p>The Site is located within the forging range of otter. The Site was assessed as having a low to moderate suitability for otter. No significant supporting habitat of this species was recorded during the surveys undertaken. Taking a precautionary approach however, potential exists for direct effects on this QI species, as a result of <i>ex-situ</i> disturbance, during any phase of the Proposed Project as otter are likely to frequent the Site, at least on occasion.</p> <p>The potential for indirect effects was also considered. There is hydrological connectivity between the Site and this SAC via mapped WFD watercourses that traverse the Site, namely the Scarbrough Order 1 stream (EPA Code: 16S38) and Lackenacoombe 16 Order 3 watercourse (EPA Code: 16L73). Additionally, several unnamed Order 1 streams within the site have further downstream connectivity to the Lower River Suir SAC.</p> <p>Therefore, a potential pathway for significant indirect effects on aquatic QIs of this SAC was identified. There is potential for the deterioration of water quality within the SAC via the runoff or percolation of pollutants</p>	<b>Yes</b>

<sup>8</sup> Accessed at <<https://www.npws.ie/protected-sites/conservation-management-planning/conservation-objectives>>



European Sites and distance from Proposed Project	Qualifying Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie <sup>8</sup> on the 20/11/2025)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
	<ul style="list-style-type: none"> <li>&gt; [1103] Twaité Shad <i>Alosa fallax fallax</i></li> <li>&gt; [1106] Salmon <i>Salmo salar</i></li> <li>&gt; [1355] Otter <i>Lutra lutra</i></li> </ul>		<p>into upstream surface water systems during the construction, operational, and decommissioning phases of the Proposed Project.</p> <p>Regards potential effects from Invasive species, Japanese Knotweed and Giant Knotweed were recorded within the Proposed Wind Farm site, in addition to Giant Hogweed and Rhododendron being recorded along the Proposed Grid Connection underground cabling route, which is hydrologically connected to this SAC. There is, therefore, potential for significant effects on this SAC as a result of the spread of invasive species as a result of the Proposed Project.</p> <p><b>A complete source-pathway-receptor chain was identified and in the absence of mitigation, there is potential for the Proposed Project to result in likely significant effects on this European Site. The European Site is considered to be within the Likely Zone of Influence of the Proposed Project and further assessment is required.</b></p>	
<p><b>Anglesey Road SAC (002125)</b></p> <p>Approx. distance from Proposed Wind Farm site <b>3.5 km</b></p> <p>Approx. distance from Proposed Grid Connection Route: <b>6.5 km</b></p>	<p>&gt; Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) * [6230]</p>	<p>Detailed conservation objectives for this site (Version 1, December 2021, were reviewed as part of the assessment and are available at:</p> <p><a href="https://www.npws.ie/sites/default/files/protected_sites/conservation_objectives/CO002125.pdf">https://www.npws.ie/sites/default/files/protected_sites/conservation_objectives/CO002125.pdf</a></p>	<p>There will be no direct effects within this SAC as the Proposed Project is located entirely outside of this designated site.</p> <p>The potential for indirect effects was also considered. This SAC lies upstream of the Site. Given the associated terrestrial distance between the Site and this SAC, in addition to the terrestrial nature of the single QI habitat of this SAC, no potential for indirect effects on this SAC were identified.</p> <p><b>No pathway for likely significant effect on this European Site was identified, when considered in the absence of any mitigation, individually or cumulatively with other plans or projects. This site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment</b></p>	<p><b>No</b></p>



European Sites and distance from Proposed Project	Qualifying Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie <sup>8</sup> on the 20/11/2025)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Approx. Hydrological Distance from the Site: <b>9 km</b>				
<p><b>Philipston Marsh SAC (001847)</b></p> <p>Approx. distance from Proposed Wind Farm site <b>6 km</b></p> <p>Approx. distance from Proposed Grid Connection route: <b>0.7 km</b></p> <p>Approx. Hydrological Distance from the Site: <b>1.1 km</b></p>	<p>Transition mires and quaking bogs [7140]</p>	<p>Detailed conservation objectives for this site (Version 1, January 2018, were reviewed as part of the assessment and are available at:</p> <p><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation-objectives/CO001847.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation-objectives/CO001847.pdf</a></p>	<p>There will be no direct effects within this SAC as the Proposed Project is located entirely outside of this designated site.</p> <p>The potential for indirect effects was also considered. The Site has direct hydrological connectivity to this SAC. The Proposed Grid Connection underground cabling route crosses the Cappawhite Order 2 stream which flows through the northern extent of this SAC. Additionally, the Grid Connection component of the Proposed Project is partially located within the same hydrological sub-catchment (Dead_SC_10) and ground water catchment (Slieve Phelim) as this SAC.</p> <p>Therefore, in the absence of best practice and mitigation and taking a precautionary approach due to the proximity of this SAC to the proposed Grid Connection works, there is potential for indirect effects on this SAC via a deterioration of water quality arising from run-off/percolation of pollutants to surface or ground waters during the construction phase of the Proposed Project.</p> <p>Regards potential effects from Invasive species, Japanese Knotweed and Giant Knotweed were recorded within the Proposed Wind Farm site, in addition to Giant Hogweed and Rhododendron being recorded along the Proposed Grid Connection underground cabling route, which are hydrologically connected to this SAC. There is, therefore, potential for significant effects on this SAC as a result of the spread of invasive species as a result of the Proposed Project.</p>	<p><b>Yes</b></p>



European Sites and distance from Proposed Project	Qualifying Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie <sup>8</sup> on the 20/11/2025)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
			<p><b>A complete source-pathway-receptor chain was identified and in the absence of mitigation, there is potential for the Proposed Project to result in likely significant effects on this European Site. The European Site is considered to be within the Likely Zone of Influence of the Proposed Project and further assessment is required.</b></p>	
<p><b>Lower River Shannon SAC (002165)</b></p> <p>Approx. distance from Proposed Wind Farm Site <b>8.8 km</b></p> <p>Approx. distance from Proposed Grid Connection Route: <b>0 km</b></p> <p>Approx. Hydrological Distance from the Site: <b>0 km</b></p>	<ul style="list-style-type: none"> <li>› Sandbanks which are slightly covered by sea water all the time [1110]</li> <li>› Estuaries [1130]</li> <li>› Mudflats and sandflats not covered by seawater at low tide [1140]</li> <li>› Coastal lagoons [1150]</li> <li>› Large shallow inlets and bays [1160]</li> <li>› Reefs [1170]</li> <li>› Perennial vegetation of stony banks [1220]</li> <li>› Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]</li> <li>› <i>Salicornia</i> and other annuals colonising mud and sand [1310]</li> <li>› Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330]</li> <li>› Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]</li> <li>› Water courses of plain to montane levels with the <i>Ranuncilion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]</li> <li>› Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410]</li> </ul>	<p>Detailed conservation objectives for this site (Version 1, August 2012), were reviewed as part of the assessment and are available at:</p> <p><a href="https://www.npws.ie/sites/default/files/protected_sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected_sites/conservation_objectives/CO002165.pdf</a></p>	<p>There is potential for direct effects due to the Proposed Grid Connection Route component of the Proposed Project overlapping with portions of this SAC.</p> <p>The Site is located within the forging range of otter. The Site was assessed as having a low to moderate suitability for otter. No significant supporting habitat of this species was recorded during the surveys undertaken. Taking a precautionary approach however, potential exists for direct effects on this QI species, as a result of <i>ex-situ</i> disturbance, during any phase of the Proposed Project as otter are likely to frequent the Site, at least on occasion.</p> <p>The potential for indirect effects was also considered. There is hydrological connectivity between the Site and this SAC via mapped WFD watercourses that traverse the Proposed Grid Connection underground cabling route, namely the Groody Order 4 watercourse [EPA Code: 25G05], which has further downstream connectivity to the Lower River Shannon SAC.</p> <p>Therefore, a potential pathway for significant indirect effects on aquatic QIs of this SAC was identified. There is potential for the deterioration of water quality within the SAC via the runoff or percolation of pollutants</p>	<p><b>Yes</b></p>



European Sites and distance from Proposed Project	Qualifying Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie <sup>8</sup> on the 20/11/2025)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
	<ul style="list-style-type: none"> <li>› Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0]</li> <li>› <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]</li> <li>› <i>Petromyzon marinus</i> (Sea Lamprey) [1095]</li> <li>› <i>Lampetra planeri</i> (Brook Lamprey) [1096]</li> <li>› <i>Lampetra fluviatilis</i> (River Lamprey) [1099]</li> <li>› <i>Salmo salar</i> (Salmon) [1106]</li> <li>› <i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]</li> <li>› <i>Lutra lutra</i> (Otter) [1355]</li> </ul>		<p>into the Groody Order 4 watercourse during the construction, operational, and decommissioning phases of the Proposed Project.</p> <p>Regards potential effects from Invasive species, Giant Hogweed, Japanese Knotweed, and Giant Knotweed were recorded within the Proposed Wind Farm site, in addition to Giant Hogweed being recorded along the Proposed Grid Connection underground cabling route, which is hydrologically connected to this SAC. There is, therefore, potential for significant effects on this SAC as a result of the spread of invasive species as a result of the Proposed Project.</p> <p><b>A complete source-pathway-receptor chain was identified and in the absence of mitigation, there is potential for the Proposed Project to result in likely significant effects on this European Site. The European Site is considered to be within the Likely Zone of Influence of the Proposed Project and further assessment is required.</b></p>	
<p><b>Bolingbrook Hill SAC (002124)</b></p> <p>Approx. distance from Proposed Wind Farm site <b>15.9 km</b></p> <p>Approx. distance from Proposed Grid</p>	<ul style="list-style-type: none"> <li>› Northern Atlantic wet heaths with (<i>Erica tetralix</i>) [4010]</li> <li>› European dry heaths [4030]</li> <li>› Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6320]</li> </ul>	<p>Detailed conservation objectives for this site (Version 1, July 2018, were reviewed as part of the assessment and are available at:</p> <p><a href="https://www.npws.ie/sites/default/files/protected_sites/conservation_objectives/CO002124.pdf">https://www.npws.ie/sites/default/files/protected_sites/conservation_objectives/CO002124.pdf</a></p>	<p>There will be no direct effects within these SACs as the Proposed Project is located entirely outside of these designated sites.</p> <p>The potential for indirect effects was also considered. Given the associated terrestrial distance between the Site and these SACs, in addition to the terrestrial nature of the QI habitats and species of these SACs, no potential for indirect effects on these SACs were identified.</p> <p><b>No pathway for likely significant effect on these European Sites was identified, when considered in the absence of any mitigation, individually or cumulatively with other plans or projects. These sites are not within the Likely Zone of Influence of the Proposed Project. Therefore, they are not considered further in this assessment</b></p>	<p><b>No</b></p>



European Sites and distance from Proposed Project	Qualifying Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie <sup>8</sup> on the 20/11/2025)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Connection Route: <b>17.8 km</b>  Approx. Hydrological Distance from the Site: <b>N/A</b>				
<b>Keeper Hill SAC (001197)</b>  Approx. distance from Proposed Wind Farm site <b>17.5 km</b>  Approx. distance from Proposed Grid Connection Route: <b>13.8 km</b>  Approx. Hydrological Distance from the Site: <b>N/A</b>	> Northern Atlantic wet heaths with ( <i>Erica tetralix</i> ) [4010] > Blanket bogs (*if active bog) [7130]	Detailed conservation objectives for this site (Version 1, October 2017, were reviewed as part of the assessment and are available at:  <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001197.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001197.pdf</a>		<b>No</b>
<b>Glenstal Wood SAC (001432)</b>	> [1421] Killarney Fern <i>Trichomanes speciosum</i>	Detailed conservation objectives for this site (Version 1, May 2018,		<b>No</b>



European Sites and distance from Proposed Project	Qualifying Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie <sup>8</sup> on the 20/11/2025)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
<p>Approx. distance from Proposed Wind Farm site <b>20 km</b></p> <p>Approx. distance from Proposed Grid Connection Route: <b>6.5 km</b></p> <p>Approx. Hydrological Distance from the Site: <b>N/A</b></p>		<p>were reviewed as part of the assessment and are available at:</p> <p><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001432.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001432.pdf</a></p>		
<p><b>Silvermine Mountains SAC (000939)</b></p> <p>Approx. distance from Proposed Wind Farm site <b>19.9 km</b></p> <p>Approx. distance from Proposed Grid</p>	<ul style="list-style-type: none"> <li>› Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</li> <li>› Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230]</li> </ul>	<p>Detailed conservation objectives for this site (Version 1, July 2018, were reviewed as part of the assessment and are available at:</p> <p><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000939.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000939.pdf</a></p>		<b>No</b>



European Sites and distance from Proposed Project	Qualifying Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie <sup>8</sup> on the 20/11/2025)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Connection Route: <b>19.2 km</b>  Approx. Hydrological Distance from the Site: <b>N/A</b>				
<b>Silvermines Mountains West SAC (002258)</b>  Approx. distance from Proposed Wind Farm site <b>20 km</b>  Approx. distance from Proposed Grid Connection Route: <b>17.7 km</b>  Approx. Hydrological Distance from the Site: <b>N/A</b>	<ul style="list-style-type: none"> <li>› Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</li> <li>› European dry heaths [4030]</li> <li>› Calaminarian grasslands of the <i>Violetalia calaminariae</i> [6130]</li> </ul>	Detailed conservation objectives for this site (Version 1, November 2017, were reviewed as part of the assessment and are available at:  <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation-objectives/CO002258.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation-objectives/CO002258.pdf</a>		<b>No</b>
<b>Clare Glen SAC (000390)</b>	<ul style="list-style-type: none"> <li>› Killarney Fern (<i>Trichomanes speciosum</i>) [1421]</li> </ul>	Detailed conservation objectives for this site (Version 1, May 2018,		<b>No</b>



European Sites and distance from Proposed Project	Qualifying Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie <sup>8</sup> on the 20/11/2025)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Approx. distance from Proposed Wind Farm site <b>20 km</b>  Approx. distance from Proposed Grid Connection Route: <b>7.7 km</b>  Approx. Hydrological Distance from the Site: <b>N/A</b>	> Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	were reviewed as part of the assessment and are available at:  <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000930.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000930.pdf</a>		
<b>Glenomra Wood SAC (001013)</b>  Approx. distance from Proposed Wind Farm site <b>35 km</b>  Approx. distance from Proposed Grid	> Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	Detailed conservation objectives for this site (Version 1, June 2018, were reviewed as part of the assessment and are available at:  <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001013.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001013.pdf</a>		<b>No</b>



European Sites and distance from Proposed Project	Qualifying Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie <sup>8</sup> on the 20/11/2025)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Connection Route: <b>12.5 km</b>  Approx. Hydrological Distance from the Site: <b>N/A</b>				
<b>Glen Bog SAC (001430)</b>  Approx. distance from Proposed Wind Farm site <b>29.7 km</b>  Approx. distance from Proposed Grid Connection Route: <b>13.7 km</b>  Approx. Hydrological Distance from the Site: <b>N/A</b>	> Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> )* [91E0]	Detailed conservation objectives for this site (Version 1, November 2017, were reviewed as part of the assessment and are available at:  <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001430.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001430.pdf</a>		<b>No</b>
<b>Special Protection Area (SPA)</b>				



European Sites and distance from Proposed Project	Qualifying Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie <sup>8</sup> on the 20/11/2025)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
<p><b>Slievefelim to Silvermines Mountains SPA (004165)</b></p> <p>Approx. distance from Proposed Wind Farm site <b>10 km</b></p> <p>Approx. distance from Proposed Grid Connection Route: <b>3.5 km</b></p> <p>Approx. Hydrological Distance from the Site: <b>N/A</b></p>	<p>› Hen harrier (<i>Circus cyaneus</i>)</p>	<p>Detailed conservation objectives for this site (Version 1, December 2021, were reviewed as part of the assessment and are available at:</p> <p><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation-objects/CO004165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation-objects/CO004165.pdf</a></p>	<p>The Site is located within the maximum foraging range (10 km) of populations of hen harrier associated with this SPA (SNH, 2016). Therefore, potential for direct effects exists for this SCI species, as a result of <i>ex-situ</i> disturbance, habitat loss, and collision risk, during the construction, operational, and decommissioning phases of the Proposed Project.</p> <p>Therefore, potential pathways for significant direct effects for the single SCI species of this SPA were identified.</p> <p><b>A complete source-pathway-receptor chain was identified and in the absence of mitigation, there is potential for the Proposed Project to result in likely significant effects on this European Site. The European Site is considered to be within the Likely Zone of Influence of the Proposed Project and further assessment is required.</b></p>	<p><b>Yes</b></p>
<p><b>River Shannon and River Fergus Estuaries SPA (004077)</b></p> <p>Approx. distance from Proposed Wind Farm site <b>38 km</b></p>	<p>› Cormorant (<i>Phalacrocorax carbo</i>) [A017]          › Whooper Swan (<i>Cygnus cygnus</i>) [A038]          › Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]          › Shelduck (<i>Tadorna tadorna</i>) [A048]          › Wigeon (<i>Anas penelope</i>) [A050]          › Teal (<i>Anas crecca</i>) [A052]          › Pintail (<i>Anas acuta</i>) [A054]          › Shoveler (<i>Anas clypeata</i>) [A056]</p>	<p>Detailed conservation objectives for this site (Version 1, December 2021, were reviewed as part of the assessment and are available at:</p> <p><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation-objects/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation-objects/CO004077.pdf</a></p>	<p>There will be no direct effects within this SPA as the Proposed Project is located entirely outside of this designated site. That said, the western portion of the Proposed Grid Connection underground cabling route lies within the maximum foraging range of several SCI species of this SPA, resulting in the potential for <i>ex-situ</i> disturbance/displacement.</p> <p>The potential for indirect effects was also considered. There is hydrological connectivity between the western portion of the Proposed</p>	<p><b>Yes</b></p>



European Sites and distance from Proposed Project	Qualifying Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie <sup>8</sup> on the 20/11/2025)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
<p>Approx. distance from Proposed Grid Connection Route: <b>7 km</b></p> <p>Approx. Hydrological Distance from the Site: <b>11 km</b></p>	<ul style="list-style-type: none"> <li>&gt; Scaup (<i>Aythya marila</i>) [A062]</li> <li>&gt; Ringed Plover (<i>Charadrius hiaticula</i>) [A137]</li> <li>&gt; Golden Plover (<i>Pluvialis apricaria</i>) [A140]</li> <li>&gt; Grey Plover (<i>Pluvialis squatarola</i>) [A141]</li> <li>&gt; Lapwing (<i>Vanellus vanellus</i>) [A142]</li> <li>&gt; Knot (<i>Calidris canutus</i>) [A143]</li> <li>&gt; Dunlin (<i>Calidris alpina</i>) [A149]</li> <li>&gt; Black-tailed Godwit (<i>Limosa limosa</i>) [A156]</li> <li>&gt; Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]</li> <li>&gt; Curlew (<i>Numenius arquata</i>) [A160]</li> <li>&gt; Redshank (<i>Tringa totanus</i>) [A162]</li> <li>&gt; Greenshank (<i>Tringa nebularia</i>) [A164]</li> <li>&gt; Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]</li> <li>&gt; Wetland and Waterbirds [A999]</li> </ul>	<p><a href="https://www.npws.ie/sites/conservation-objectives/CO004077.pdf">sites/conservation-objectives/CO004077.pdf</a></p>	<p>Grid Connection Route component of the Site and this SPA via the Groody Order 4 watercourse. This subsequently discharges into this SPA approximately 11km downstream at its closest point.</p> <p>Therefore, in the absence of best practice and mitigation and taking a precautionary approach due to the proximity of this SPA to the proposed Grid Connection works, there is potential for indirect effects on the wetland habitat of this SPA via a deterioration of water quality arising from run-off/percolation of pollutants to surface or ground waters during the construction phase of the Proposed Project.</p> <p>Regards potential effects from Invasive species, Giant Hogweed, Japanese Knotweed, and Giant Knotweed were recorded within the Proposed Wind Farm site, in addition to Giant Hogweed being recorded along the Proposed Grid Connection underground cabling route, which is hydrologically connected to this SPA. There is, therefore, potential for significant effects on this SPA as a result of the spread of invasive species as a result of the Proposed Project.</p> <p><b>A complete source-pathway-receptor chain was identified and in the absence of mitigation, there is potential for the Proposed Project to result in likely significant effects on this European Site. The European Site is considered to be within the Likely Zone of Influence of the Proposed Project and further assessment is required.</b></p>	

## 4.2 **Appropriate Assessment Screening Conclusion**

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 Project, individually or in combination with other plans and projects, would be likely to have a significant effect on the following:

- > Lower River Suir SAC (002137)
- > Lower River Shannon SAC (002165)
- > Philipston Marsh SAC (001847)
- > Slievefelim to Silvermines Mountains SPA (004165)
- > River Shannon and River Fergus Estuaries SPA (004077)

As a result, an Appropriate Assessment of the Proposed Project is required. Information to enable the competent authority to carry out an AA of the Proposed Project is presented in Sections 5 of this report.

5.

## **STAGE 2 – NATURA IMPACT STATEMENT (NIS)**

The potential for likely significant effects on the following European Sites in the absence of any mitigation, individually or cumulatively with other plans or projects, was identified in the preceding section:

- > Lower River Suir SAC (002137)
- > Lower River Shannon SAC (002165)
- > Philipston Marsh SAC (001847)
- > Slievefelim to Silvermines Mountains SPA (004165)
- > River Shannon and River Fergus Estuaries SPA (004077)

The following sections consider each European Site individually to:

1. Provide the results of any additional survey work that was necessary to inform an impact assessment.
2. Determine which individual qualifying features have the potential to be adversely affected by the Proposed Project.
3. Provide information with regard to the Conservation Objectives and site-specific pressures and threats for those qualifying features that have the potential to be adversely affected.

## 5.1 Identification of relevant Qualifying Features and Desk Study

### 5.1.1 Lower River Suir SAC (002137)

The potential for impacts on this SAC was identified in Section 4.1 above. The identified pathways for effect include the following:

- › Deterioration of water quality via the direct and indirect runoff or spillage of pollutants during the construction and operational phases due to the hydrological connectivity between the Proposed Wind Farm site and this SAC, in addition to the Grid Connection Route component of the Proposed Project directly overlapping with portions of this SAC.
- › Disturbance/displacement to QI species which may utilise suitable habitat adjacent to the Site during the construction and operational phases of the Proposed Project.
- › Indirect effects due to the spread of invasive species, which included Giant Hogweed, Japanese Knotweed, Giant Knotweed, and Rhododendron as a result of the Proposed Project.

The Site-Specific Conservation Objectives (SSCOs) document and Natura 2000 Data Form for this designated site were reviewed during this assessment and can be found at the following online locations:

**SSCOs:** [https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO002137.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002137.pdf)  
 Accessed the 21<sup>st</sup> of November 2025

**Natura 2000 Data Form:**  
<https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0002137&release=55> Accessed the 21<sup>st</sup> of November 2025

Table 5-1 below lists the qualifying features of this European Site and determines, in the light of their Conservation Objectives, whether there is any complete source-pathway-receptor chain, by which adverse effects may occur.



### 5.1.1.1 Identification of Individual Qualifying Features with the Potential to be Affected

Table 5-1 Assessment of Qualifying features of the Lower River Suir SAC [002137] potentially affected.

Qualifying feature	Conservation Objective (NPWS, Version 1, March, 2017 <sup>9</sup> )	Rationale	Potential for Adverse Effects Yes/No
[1330] Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> )	To restore the favourable conservation condition of Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) in Lower River Suir SAC	According to Map 3 in the Site-Specific Conservation Objectives for this SAC, the extent of this QI habitat is located approximately > 100km downstream from the Site. Therefore, no potential pathway for significant indirect effects was identified due to the intervening distance and waterbodies between this QI habitat and the Proposed Project.  <b>No complete source- pathway- receptor chain for any effect on this habitat as a result of the Proposed Project was identified. No further assessment is required.</b>	<b>No</b>
[1410] Mediterranean salt meadows ( <i>Juncetalia maritimi</i> )	To restore the favourable conservation condition of Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) in Lower River Suir SAC.	The total area of the QI habitat in the Lower River Suir SAC is currently unknown according to the Site-Specific Conservation Objectives for this SAC. That said, due to the coastal nature of this QI habitat, it will be located > 100km downstream from the Site. Therefore, no potential pathway for indirect significant effects was identified due to the intervening distance and waterbodies between this QI habitat and the Proposed Project.  <b>No complete source- pathway- receptor chain for any effect on this habitat as a result of the Proposed Project was identified. No further assessment is required.</b>	<b>No</b>
[3260] Water courses of plain to montane levels with the	To maintain the favourable conservation condition of Water	According to the Site-Specific Conservation Objectives for this SAC, little is known about the distribution of this QI habitat. The description of this habitat covers upland rivers with	<b>Yes</b>

<sup>9</sup> NPWS (2017) Conservation Objectives: Lower River Suir SAC [002137] Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.



Qualifying feature	Conservation Objective (NPWS, Version 1, March, 2017 <sup>9</sup> )	Rationale	Potential for Adverse Effects Yes/No
<i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation in Lower River Suir SAC.	<p>bryophytes and macroalgae to lowland depositing rivers with pondweeds and starworts. Due to the number of watercourses with downstream connectivity to this SAC within the Site, there is potential for effect.</p> <p>Therefore, following the precautionary principle, a potential pathway for significant effects on this QI habitat was identified due to the proximity of the proposed works to the SAC and the direct hydrological connectivity which exists via mapped watercourses within the Site. A potential pathway for adverse effects on this QI habitat was identified via the deterioration of water quality within the SAC arising from the runoff of pollutants into surface water systems during the construction and operational phases of the Proposed Project</p> <p><b>A complete source-pathway-receptor chain for adverse effects on this habitat was identified, and it is assessed further in this NIS in Section 5.1.1.3.</b></p>	
[6430] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	To maintain the favourable conservation condition of Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels in Lower River Suir SAC.	<p>According to the Site-Specific Conservation Objectives for this SAC, the total area and distribution of this QI habitat is currently unknown. This habitat is expected to occur with areas of alluvial forests [91E0] and other woodland types in fringe areas along rivers, in addition to open marsh and wet grassland within the SAC.</p> <p>Therefore, following the precautionary principle, a potential pathway for significant effects on this QI was identified via the deterioration of water quality within the SAC arising from the runoff or percolation of pollutants into surface or ground water systems during the construction and operational phases of the Proposed Project.</p> <p><b>A complete source-pathway-receptor chain for adverse effects on this habitat was identified, and it is assessed further in this NIS in Section 5.1.1.3.</b></p>	<b>Yes</b>
[91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	To restore the favourable conservation condition of Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i>	According to Map 4 in the Site-Specific Conservation Objectives for this SAC, the closest example of this QI habitat downstream of the Site is located approx. 65km away. Therefore, no potential pathway for indirect significant effects was identified due to the terrestrial nature	<b>No</b>



Qualifying feature	Conservation Objective (NPWS, Version 1, March, 2017 <sup>9</sup> )	Rationale	Potential for Adverse Effects Yes/No
	in the British Isles in Lower River Suir SAC.	of this QI habitat, in addition to intervening distance and waterbodies between this QI habitat and the Proposed Project.  <b>No complete source- pathway- receptor chain for any effect on this habitat as a result of the Proposed Project was identified. No further assessment is required.</b>	
[91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> )	To restore the favourable conservation condition of Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> )* in Lower River Suir SAC.	According to Map 5 in the Site-Specific Conservation Objectives for this SAC, the closest example of this QI habitat lies > 80km downstream. Therefore, due to the significant distance between this QI habitat and the Site, and the terrestrial nature of this QI habitat, there is no potential for indirect effects on this QI habitat.  <b>No complete source- pathway- receptor chain for any effect on this habitat as a result of the Proposed Project was identified. No further assessment is required.</b>	No
[91J0] <i>Taxus baccata</i> woods of the British Isles*	To restore the favourable conservation condition of <i>Taxus baccata</i> woods of the British Isles* in Lower River Suir SAC.	According to the Site-Specific Conservation Objectives for this SAC, this QI habitat has not been mapped in detail and therefore the total area is unknown. That said, no potential pathway for indirect significant effects was identified for this QI habitat due its terrestrial nature.  <b>No complete source- pathway- receptor chain for any effect on this habitat as a result of the Proposed Project was identified. No further assessment is required.</b>	No
[1029] Freshwater Pearl Mussel ( <i>Margaritifera margaritifera</i> )	To restore the favourable conservation condition of Freshwater Pearl Mussel in Lower River Suir SAC.	According to Map 6 of the Site-Specific Conservation Objectives for this SAC, the closest Freshwater Pearl Mussel catchment is the Clodiagh which is > 90km downstream of the Site. Therefore, no potential pathway for indirect significant effects was identified due to the intervening distance and waterbodies between this QI species and the Proposed Project.  <b>No complete source- pathway- receptor chain for any effect on this habitat as a result of the Proposed Project was identified. No further assessment is required.</b>	No



Qualifying feature	Conservation Objective (NPWS, Version 1, March, 2017 <sup>9</sup> )	Rationale	Potential for Adverse Effects Yes/No
[1092] White-clawed Crayfish ( <i>Austropotamobius pallipes</i> )	To maintain the favourable conservation condition of White-clawed Crayfish in Lower River Suir SAC.	According to Map 7 of the Site-Specific Conservation Objectives for this SAC, White-clawed crayfish occurs extensively along the River Suir and its tributaries. Therefore, a potential pathway for significant effect on this QI species was identified via the deterioration of water quality within the SAC arising from the runoff or percolation of pollutants into surface or ground water systems during the construction and operational phases of the Proposed Project.  <b>A complete source-pathway-receptor chain for adverse effects on this habitat was identified, and it is assessed further in this NIS in Section 5.1.1.4.</b>	<b>Yes</b>
[1095] Sea Lamprey ( <i>Petromyzon marinus</i> )	To restore the favourable conservation condition of Sea Lamprey in Lower River Suir SAC.	There is potential for these species to occur within the Lower River Suir SAC. There is direct hydrological connectivity between this SAC and the Proposed Grid Connection Route via several mapped watercourses.	<b>Yes</b>
[1096] Brook Lamprey ( <i>Lampetra planeri</i> )	To restore the favourable conservation condition of Brook Lamprey in Lower River Suir SAC.	Therefore, taking a precautionary approach, a pathway for adverse effects on these QI species was identified via the deterioration of water quality within the SAC arising from the runoff of pollutants into surface water systems during the construction and operational phases of the Proposed Project.	<b>Yes</b>
[1099] River Lamprey ( <i>Lampetra fluviatilis</i> )	To restore the favourable conservation condition of River Lamprey in Lower River Suir SAC.	<b>A complete source-pathway-receptor chain for adverse effects on these species was identified, and it is assessed further in this NIS in Section 5.1.1.4.</b>	<b>Yes</b>
[1103] Twaité Shad ( <i>Alosa fallax fallax</i> )	To restore the favourable conservation condition of Twaité Shad in Lower River Suir SAC.		<b>Yes</b>
[1106] Atlantic Salmon ( <i>Salmo salar</i> )	To restore the favourable conservation condition of Atlantic Salmon in Lower River Suir SAC.		<b>Yes</b>



Qualifying feature	Conservation Objective (NPWS, Version 1, March, 2017 <sup>9</sup> )	Rationale	Potential for Adverse Effects Yes/No
[1355] Otter ( <i>Lutra lutra</i> )	To maintain the favourable conservation condition of Otter in Lower River Suir SAC.	<p>According to the Site-Specific Conservation Objectives, the range of this QI species is estimated at 93.6% throughout the SAC. The Proposed Grid Connection Route crosses this SAC in addition to several mapped watercourses which provide potential supporting habitat for this species.</p> <p>Therefore, taking a precautionary approach, a pathway for adverse effects on this QI species was identified via the deterioration of water quality within the SAC arising from the runoff of pollutants into surface water systems and disturbance/displacement from the construction and operational phases of the Proposed Project.</p> <p><b>A complete source-pathway-receptor chain for adverse effects on this species was identified, and it is assessed further in this NIS.</b></p>	<b>Yes</b>

### 5.1.1.2 Site Specific Pressures and Threats

As per the Natura 2000 Data Form, the site-specific threats, pressures, and activities with potential to impact on the Lower River Suir SAC were reviewed and considered in relation to the Proposed Project. These are provided in Table 5-2.

Table 5-2 Site-specific threats, pressures, and activities with potential to have effects on the Lower River Suir SAC.

Negative Impacts			
Rank	Threats and Pressures		Inside/Outside
High	E01	Urbanised areas, human habitation	Both
Low	A01	Cultivation	Inside
Low	J02.01.02	Reclamation of land from sea, estuary or marsh	Inside
High	H01	Pollution to surface waters (limnic, terrestrial, marine & brackish)	Both
Medium	J02.01	Landfill, land reclamation and drying out, general	Both
Low	I01	Invasive non-native species	Inside
Low	D03.01	Port areas	Both
High	E03	Discharges	Both
Low	B	Sylviculture, forestry	Outside
High	J02.12.02	Dykes and flooding defence in inland water systems	Inside
High	A08	Fertilization	Outside

As potential impacts on water quality within this European Site, as well as the spread of invasive species, has been identified, the Proposed Project in the absence of mitigation, can potentially contribute to the existing threats and pressures of this SAC.

### 5.1.1.3 Habitat Specific Information

#### [3260] Water courses of plain to montane levels with the *Ranunculon fluitantis* and *Callitricho-Batrachion* vegetation

According to the SSCO (NPWS, 2017), Water courses of plain to montane levels with the *Ranunculon fluitantis* and *Callitricho-Batrachion* vegetation for this SAC has not been mapped, however it would occur throughout this SAC. The area of the qualifying habitat is 71ha as per the Natura 2000 Data Form.

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI habitat is ‘Inadequate’ and the overall Conservation Trend is ‘Deteriorating’.

There is potential for this habitat where it occurs downstream of the Proposed Project to be subject to a deterioration in water quality via the indirect runoff or spillage of pollutants during construction.

The targets and attributes for this QI, as per the SSCO of the SAC, are provided in Table 5-3.

Table 5-3 Targets and Attributes for [3260] Water courses of plain to montane levels with the *Ranunculon fluitantis* and *Callitricho-Batrachion* vegetation of the Lower River Suir SAC.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Habitat area	Area stable or increasing, subject to natural processes	No – There will be no reduction in habitat area, as a result of the Proposed Project, as the works associated with the Proposed Grid Connection Route which overlap with this SAC are minor in nature.

Habitat distribution	No decline, subject to natural processes	No – There will be no alteration in habitat distribution, as a result of the Proposed Project, as the works associated with the Proposed Grid Connection Route which overlap with this SAC are minor in nature.
Hydrological regime: river flow	Maintain appropriate hydrological regimes	No, the Proposed Project will not undermine this target.
Hydrological regime: groundwater discharge	Maintain appropriate hydrological regime	No, the Proposed Project will not undermine this target.
Hydrological regime: tidal influence	Maintain natural tidal regime	No, the Proposed Project will not undermine this target.
Substratum composition: particle size range	Maintain appropriate substratum particle size range, quantity and quality, subject to natural processes	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target.
Water quality	Maintain appropriate water quality to support the natural structure and functioning of the habitat	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Typical species	Maintain typical species in good condition, including appropriate distribution and abundance	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Floodplain connectivity	Maintain floodplain connectivity necessary to support the typical species and vegetation composition of the habitat	No, the Proposed Project will not undermine this target.
Fringing habitats	Maintain marginal fringing habitats that support the typical species and vegetation composition of the habitat	No, the Proposed Project will not undermine this target.

**[6430] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels**

According to the SSCO (NPWS, 2017), Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels for this SAC has not been mapped, however it would occur throughout this SAC. The area of the qualifying habitat is 71ha as per the Natura 2000 Data Form.

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI habitat is ‘Bad’ and deteriorating.

Taking a precautionary approach, there is potential for this QI habitat where it occurs downstream of the Proposed Project to be subject to a deterioration in water quality.

The targets and attributes for this QI, as per the SSCO of the SAC, are provided in Table 5-4.

Table 5-4 Targets and attributes associated with nominated site-specific conservation objectives for *Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels in Lower River Suir SAC*.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Habitat area	Area stable or increasing, subject to natural processes	No, deterioration of water quality will not undermine this target.
Habitat distribution	No decline, subject to natural processes	No, deterioration of water quality will not undermine this target.
Hydrological regime: Flooding depth/height of water table	Maintain appropriate hydrological regime	No – The Proposed Project will not have effect on flooding regimes.
Vegetation composition: positive indicator species	At least three positive indicator species present	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation composition: positive indicator species	Cover of positive indicator species at least 40%	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation composition: non-native species	Cover of non-native species not more than 1%	No, deterioration of water quality will not undermine this target.
Vegetation composition: negative indicator species	Cover of negative indicator species not more than 33%	No, deterioration of water quality will not undermine this target.
Vegetation composition: scrub, bracken and heath	Cover of scrub, bracken ( <i>Pteridium aquilinum</i> ) and heath not more than 5%	No, deterioration of water quality will not undermine this target.
Vegetation structure: height	Herb height at least 50cm	No, deterioration of water quality will not undermine this target.
Physical structure: bare soil	Cover of bare soil not more than 10%	No, deterioration of water quality will not undermine this target.
Physical structure: grazing and disturbance	Area of the habitat showing signs of serious grazing or disturbance less than 20m <sup>2</sup>	No, deterioration of water quality will not undermine this target.

#### 5.1.1.4 Species Specific Information

##### [1092] White-clawed Crayfish (*Austropotamobius pallipes*)

According to Map 7 of the SSCO (NPWS, 2017), with respect to the distribution of this species within the SAC, this species is known to occur both upstream and downstream of the Site.

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI species is ‘Bad’ with a deteriorating trend.

Taking a precautionary approach there is potential for deterioration of water quality to impact on white-clawed crayfish which may occur downstream of the Proposed Project.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-5.

*Table 5-5 Targets and attributes associated with nominated site-specific conservation objectives for White-clawed Crayfish in Lower River Suir SAC.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Distribution	No reduction from baseline. See map 7.	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Population structure: recruitment	Juveniles and/or females with eggs in all occupied tributaries	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Negative indicator species	No alien crayfish species	No, deterioration of water quality will not undermine this target.
Disease	No instances of disease	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Water quality	At least Q3-4 at all sites sampled by EPA	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Habitat quality: heterogeneity	No reduction in habitat heterogeneity or habitat quality	No, deterioration of water quality will not undermine this target.

### [1095] Sea Lamprey (*Petromyzon marinus*)

According to the SSCO (NPWS, 2017), artificial barriers can block or cause difficulties to lampreys’ upstream migration, thereby limiting the species to lower stretches and restricting access to spawning areas.

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI species is ‘Bad’ with a deteriorating trend. The sea lamprey is listed in the most recent Irish Red Data Book as Near Threatened. Barriers to upstream migration (e.g. weirs) are considered the major impediment to good conservation status for sea lamprey as these limit access to spawning beds and juvenile habitat.

Taking a precautionary approach there is potential for deterioration of water quality to impact on sea lamprey which may occur downstream of the Proposed Project.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-6.

Table 5-6 Targets and attributes associated with nominated site-specific conservation objectives for Sea Lamprey in Lower River Suir SAC.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Distribution: extent of anadromy	Greater than 75% of main stem length of rivers accessible from estuary	No, the Proposed Project will not undermine this target as will not result in any barriers of connectivity.
Population structure of juveniles	At least three age/size groups present	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey.
Juvenile density in fine sediment	Juvenile density at least 1/m <sup>2</sup>	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey.
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat
Availability of juvenile habitat	More than 50% of sample sites positive	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat

### [1096] Brook Lamprey (*Lampetra planeri*)

According to the SSCO (NPWS, 2017), artificial barriers can block or cause difficulties to brook lampreys' migration, both up- and downstream, thereby possibly limiting the species to specific stretches and creating genetically isolated populations (Espanhol et al., 2007).

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI species is 'Favourable'.

Taking a precautionary approach there is potential for deterioration of water quality to impact on brook lamprey which may occur downstream of the Proposed Project.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-7.

Table 5-7 Targets and attributes associated with nominated site-specific conservation objectives for Brook Lamprey in Lower River Suir SAC.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
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Distribution	Access to all water courses down to first order streams	No, the Proposed Project will not undermine this target as will not result in any barriers of connectivity.
Population structure of juveniles	At least three age/size groups of brook/river lamprey present	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey.
Juvenile density in fine sediment	Mean catchment juvenile density of brook/river lamprey at least 2/m <sup>2</sup>	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey.
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat.
Availability of juvenile habitat	More than 50% of sample sites positive	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat.

### [1099] River Lamprey (*Lampetra fluviatilis*)

According to the SSCO (NPWS, 2017), artificial barriers can block or cause difficulties to river lampreys' migration, both up- and downstream, thereby possibly limiting species to specific stretches and creating genetically isolated populations (Espanhol et al., 2007).

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI species is 'Inadequate'. This is largely due to the inability to distinguish between river lamprey and brook lamprey larvae, and the challenges associated with sampling for adult river lamprey, means that an evaluation of their actual range and population size cannot be undertaken.

Taking a precautionary approach there is potential for deterioration of water quality to impact on river lamprey which may occur downstream of the Proposed Project.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-8.

*Table 5-8 Targets and attributes associated with nominated site-specific conservation objectives for River Lamprey in Lower River Suir SAC.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Distribution	Access to all water courses down to first order streams	No, the Proposed Project will not undermine this target as will not result in any barriers of connectivity.

Population structure of juveniles	At least three age/size groups of river/brook lamprey present	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey.
Juvenile density in fine sediment	Mean catchment juvenile density of brook/river lamprey at least 2/m <sup>2</sup>	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey.
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat.
Availability of juvenile habitat	More than 50% of sample sites positive	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat.

### [1103] Twaite Shad (*Alosa fallax fallax*)

According to the SSCO (NPWS, 2017), in some catchments, artificial barriers block twaite shads' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI species is 'Bad' with a deteriorating trend.

Taking a precautionary approach there is potential for deterioration of water quality to impact on twaite shad which may occur downstream of the Proposed Project.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-9.

*Table 5-9 Targets and attributes associated with nominated site-specific conservation objectives for Twaite Shad in Lower River Suir SAC.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Distribution: extent of anadromy	Greater than 75% of main stem length of rivers accessible from estuary	No, the Proposed Project will not undermine this target as will not result in any barriers of connectivity.
Population structure: age classes	More than one age class present	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey.

Extent and distribution of spawning habitat	No decline in extent and distribution of spawning habitats	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey.
Water quality: oxygen levels	No lower than 5mg/l	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat.
Spawning habitat quality: Filamentous algae; macrophytes; sediment	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat

### [1106] Salmon (*Salmo salar*)

According to the SSCO (NPWS, 2012), artificial barriers block salmon's upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas.

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI species is 'Bad' and the overall Conservation Trend is deteriorating.

Taking a precautionary approach there is potential for deterioration of water quality to impact on Salmon where they occur downstream of the Proposed Project.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-10.

*Table 5-10 Targets and attributes associated with nominated site-specific conservation objectives for Salmon in Lower River Suir SAC.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Distribution: extent of anadromy	100% of river channels down to second order accessible from estuary	No, the Proposed Project will not undermine this target.
Adult spawning fish	Conservation limit (CL) for each system consistently exceeded	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Salmon fry abundance	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Out-migrating smolt abundance	No significant decline	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.

Number and distribution of redds	No decline in number and distribution of spawning redds due to anthropogenic causes	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target.
Water quality	At least Q4 at all sites sampled by EPA	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.

### [1355] Otter (*Lutra lutra*)

According to the SSCO (NPWS, 2017), the area of terrestrial habitat is mapped and calculated as 116.17ha above high water mark (HWM) and 726.61ha along riverbanks. The length of freshwater (river) habitat was mapped and calculated as 382.31km, which was calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982). The area of marine habitat was mapped and calculated as 712.27ha, based on evidence that otters tend to forage within 80 metres of the shoreline (NPWS, 2007).

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI species is 'Favourable' and the overall Conservation Trend is 'Stable'.

Taking a precautionary approach there is potential for deterioration of water quality to impact on otter, via reduced prey availability, where they occur downstream of the Proposed Project. Furthermore, given there is a requirement for watercourse crossings, there is potential for disturbance/displacement to this species in the vicinity of such works.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-11.

*Table 5-11 Targets and attributes associated with nominated site-specific conservation objectives for Otter in Lower River Suir SAC.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Distribution	No significant decline	No, the Proposed Project will not undermine this target.
Extent of terrestrial habitat	No significant decline. Area mapped and calculated as 116.17ha above high water mark (HWM) and 726.61ha along river banks	No, the Proposed Project will not undermine this target.
Extent of marine habitat	No significant decline. Area mapped and calculated as 712.27ha	No, the Proposed Project will not undermine this target.
Extent of freshwater (river) habitat	No significant decline. Length mapped and calculated as 382.31km	No, the Proposed Project will not undermine this target.
Couching sites and holts	No significant decline	No, the Proposed Project will not undermine this target.
Fish biomass available	No significant decline	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.



Barriers to connectivity	No significant increase	No, the Proposed Project will not undermine this target.
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## 5.1.2

## Lower River Shannon SAC (002165)

The potential for impacts on this SAC was identified in Section 4.1 above. The identified pathways for effect include the following:

- › Deterioration of water quality via the direct and indirect runoff or spillage of pollutants during the construction and operational phases due to the hydrological connectivity between the Proposed Wind Farm Site and this SAC, in addition to the Grid Connection Route component of the Proposed Project directly overlapping with portions of this SAC.
- › Disturbance/displacement to QI species which may utilise suitable habitat adjacent to the Site during the construction and operational phases of the Proposed Project.
- › Indirect effects due to the spread of invasive species, which included Giant Hogweed, Japanese Knotweed, Giant Knotweed, and Rhododendron as a result of the Proposed Project.

The Site-Specific Conservation Objectives (SSCOs) document and Natura 2000 Data Form for this designated site were reviewed during this assessment and can be found at the following online locations:

**SSCOs:** [https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO002165.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf)  
Accessed the 21<sup>st</sup> of November 2025

**Natura 2000 Data Form:**  
<https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0002165&release=55> Accessed the 21<sup>st</sup> of November 2025

Table 5-12 below lists the qualifying features of this European Site and determines, in the light of their Conservation Objectives, whether there is any complete source-pathway-receptor chain, by which adverse effects may occur.



### 5.1.2.1 Identification of Individual Qualifying Features with the Potential to be Affected.

Table 5-12 Assessment of Qualifying features of the Lower River Shannon SAC [002165] potentially affected.

Qualifying feature	Conservation Objective (NPWS, Version 1, August 2012)	Rationale	Potential for Adverse Effects
[1110] Sandbanks which are slightly covered by sea water all the time	To maintain the favourable conservation condition of Sandbanks which are slightly covered by sea water all the time in the Lower River Shannon SAC.	<p>According to Map 3 in the Site-Specific Conservation Objectives for this SAC, the nearest known location of this QI habitat is approximately 80km west from the closest point of the Proposed Grid Connection. Therefore, no potential for adverse effects, as a result of habitat degradation via the deterioration of water quality within the SAC, was identified due to the intervening distance between the known distribution of this QI and the location of the Proposed Project.</p> <p>Given the marine and saline nature of this habitat, there is no potential for recorded invasive species (Japanese knotweed, Giant knotweed, Giant hogweed and Rhododendron, which are entirely terrestrial) to establish within this habitat, as a result of the Proposed Project.</p> <p><b>No complete source- pathway- receptor chain for adverse effects on this QI habitat as a result of the Proposed Project was identified. No further assessment is required.</b></p>	<b>No</b>
[1130] Estuaries	To maintain the favourable conservation condition of Estuaries in the Lower River Shannon SAC.	<p>According to Map 4 in the Site-Specific Conservation Objectives for this SAC, this QI habitat is located approximately 5km west from the closest point of the Proposed Grid Connection which has direct downstream connectivity to this SAC. Therefore, a potential pathway for adverse effect on this QI was identified via the deterioration of water quality within the SAC arising from the potential runoff of pollutants into surface water systems during the construction and operational phase of the Proposed Project.</p> <p>Given the marine and saline nature of this habitat, there is no potential for recorded invasive species (Japanese knotweed, Giant knotweed, Giant hogweed and Rhododendron, which are entirely terrestrial) to establish within this habitat, as a result of the Proposed Project.</p>	<b>Yes</b>



Qualifying feature	Conservation Objective (NPWS, Version 1, August 2012)	Rationale	Potential for Adverse Effects
		<b>A complete source-pathway-receptor chain for adverse effects on this QI habitat was identified, and it is assessed further in this NIS in Section 5.2.2.3.</b>	
[1140] Mudflats and sandflats not covered by seawater at low tide	To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in the Lower River Shannon SAC.	<p>According to Map 5 in the SSCO for this SAC, the closest example of this QI habitat to the Site is located approximately 5 km west of the Proposed Grid Connection with direct hydrological connectivity.</p> <p>However, due the associated distance between the Proposed Project and this QI habitat, the scale and duration of the proposed works in proximity to this SAC, and large extent of receiving water (the River Shannon Estuary), no pathway for adverse effect on this QI was identified as a result of the Proposed Project.</p> <p>Given the marine and saline nature of this habitat, there is no potential for recorded invasive species (Japanese knotweed, Giant knotweed, Giant hogweed and Rhododendron, which are entirely terrestrial) to establish within this habitat, as a result of the Proposed Project.</p> <p><b>No complete source- pathway- receptor chain for adverse effects on this QI habitat as a result of the Proposed Project was identified. No further assessment is required.</b></p>	<b>No</b>
[1150] *Coastal lagoons	To restore the favourable conservation condition of Coastal lagoons in the Lower River Shannon SAC.	<p>According to Map 6 in the Site-Specific Conservation Objectives for this SAC, the closest example of this QI habitat to the Site is located approximately 30km west of the Proposed Grid Connection.</p> <p>Due to the absence of direct hydrological connectivity and associated distance between the Proposed Project and this QI habitat, the scale and duration of the proposed works in proximity to this SAC, and large extent of receiving water (the River Shannon Estuary), no pathway for adverse effect on this QI was identified as a result of the Proposed Project.</p> <p>Given the marine and saline nature of this habitat, there is no potential for recorded invasive species (Japanese knotweed, Giant knotweed, Giant hogweed and Rhododendron, which are entirely terrestrial) to establish within this habitat, as a result of the Proposed Project.</p>	<b>No</b>



Qualifying feature	Conservation Objective (NPWS, Version 1, August 2012)	Rationale	Potential for Adverse Effects
		<b>No complete source- pathway- receptor chain for adverse effects on this QI habitat as a result of the Proposed Project was identified. No further assessment is required.</b>	
[1160] Large shallow inlets and bays	To maintain the favourable conservation condition of Large shallow inlets and bays in the Lower River Shannon SAC.	<p>According to Map 7 in the Site-Specific Conservation Objectives for this SAC, this QI habitat is located on the outer reaches of the River Shannon estuary, approximately 65km west of the Proposed Grid Connection.</p> <p>Due to the absence of direct hydrological connectivity and associated distance between the Proposed Project and this QI habitat, the scale and duration of the proposed works in proximity to this SAC, and large extent of receiving water (the River Shannon Estuary), no pathway for adverse effect on this QI was identified as a result of the Proposed Project.</p> <p>Given the marine and saline nature of this habitat, there is no potential for recorded invasive species (Japanese knotweed, Giant knotweed, Giant hogweed and Rhododendron, which are entirely terrestrial) to establish within this habitat, as a result of the Proposed Project.</p> <p><b>No complete source- pathway- receptor chain for adverse effects on this QI habitat as a result of the Proposed Project was identified. No further assessment is required.</b></p>	<b>No</b>
[1170] Reefs	To maintain the favourable conservation condition of Reefs in the Lower River Shannon SAC.	<p>According to Map 8 in the Site-Specific Conservation Objectives for this SAC, this QI habitat is located on the outer reaches of the River Shannon estuary, approximately 35km west of the Proposed Grid Connection.</p> <p>Due to the absence of direct hydrological connectivity and associated distance between the Proposed Project and this QI habitat, the scale and duration of the proposed works in proximity to this SAC, and large extent of receiving water (the River Shannon Estuary), no pathway for adverse effect on this QI was identified as a result of the Proposed Project.</p> <p>Given the marine and saline nature of this habitat, there is no potential for recorded invasive species (Japanese knotweed, Giant knotweed, Giant hogweed and Rhododendron, which are entirely terrestrial) to establish within this habitat, as a result of the Proposed Project.</p>	<b>No</b>



Qualifying feature	Conservation Objective (NPWS, Version 1, August 2012)	Rationale	Potential for Adverse Effects
		<b>No complete source- pathway- receptor chain for adverse effects on this QI habitat as a result of the Proposed Project was identified. No further assessment is required.</b>	
[1220] Perennial vegetation of stony banks	To maintain the favourable conservation condition of Perennial vegetation of stony banks in the Lower River Shannon SAC.	<p>According to Map 10 in the Site-Specific Conservation Objectives for this SAC, the current extent of this habitat is unknown within the SAC, although this habitat is associated with the upper beaches of coastal surroundings. Given the predominantly terrestrial nature of this QI habitat and the intervening distance between this QI and the Site, there is no potential for adverse effects.</p> <p>Given the marine and saline nature of this habitat, there is no potential for recorded invasive species (Japanese knotweed, Giant knotweed, Giant hogweed and Rhododendron, which are entirely terrestrial) to establish within this habitat, as a result of the Proposed Project.</p> <p><b>No complete source- pathway- receptor chain for adverse effects on this QI habitat as a result of the Proposed Project was identified. No further assessment is required.</b></p>	<b>No</b>
[1230] Vegetated sea cliffs of the Atlantic and Baltic coasts	To maintain the favourable conservation condition of Vegetated sea cliffs in the Lower River Shannon SAC.	<p>According to Map 11 in the Site-Specific Conservation Objectives for this SAC, the closest example of this QI habitat to the Proposed Project lies &gt; 50 km from the Proposed Grid Connection at its closest point. Due to the terrestrial nature of this QI habitat and the intervening distance between this QI and the Site there is no potential for adverse effects.</p> <p><b>No complete source- pathway- receptor chain for adverse effects on this QI habitat as a result of the Proposed Project was identified. No further assessment is required.</b></p>	<b>No</b>
[1310] Salicornia and other annuals colonizing mud and sand	To maintain the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in the Lower River Shannon SAC.	<p>The Site-Specific Conservation Objectives for this SAC state that further areas of this habitat that have not been surveyed may be present within the SAC in addition to those outlined in Map 12. There is direct hydrological connectivity between this SAC and the Proposed Grid Connection via the several mapped watercourses.</p>	<b>Yes</b>



Qualifying feature	Conservation Objective (NPWS, Version 1, August 2012)	Rationale	Potential for Adverse Effects
		<p>Therefore, following the precautionary principle, a potential pathway for significant effect on this QI was identified via the deterioration of water quality within the SAC arising from the runoff or percolation of pollutants into surface water systems during the construction and operational phases of the Proposed Project.</p> <p>Given the marine and saline nature of this habitat, there is no potential for recorded invasive species (Japanese knotweed, Giant knotweed, Giant hogweed and Rhododendron, which are entirely terrestrial) to establish within this habitat, as a result of the Proposed Project.</p> <p><b>A complete source-pathway-receptor chain for adverse effects on this habitat was identified, and it is assessed further in this NIS in Section 5.1.2.3.</b></p>	
[1330] Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> )	To restore the favourable conservation condition of Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) in the Lower River Shannon SAC.	<p>According to Map 12 in the Site-Specific Conservation Objectives for this SAC, the closest example of this QI habitat to the Proposed Project lies approximately 15km west of the Proposed Grid Connection. The SSCOs also state that further areas of this habitat that have not been surveyed may be present within the SAC. There is direct hydrological connectivity between this SAC and the Proposed Grid Connection via the several mapped watercourses.</p> <p>Therefore, following the precautionary principle, a potential pathway for significant effect on this QI was identified via the deterioration of water quality within the SAC arising from the runoff or percolation of pollutants into surface water systems during the construction phases of the Proposed Project.</p> <p>Given the marine and saline nature of this habitat, there is no potential for recorded invasive species (Japanese knotweed, Giant knotweed, Giant hogweed and Rhododendron, which are entirely terrestrial) to establish within this habitat, as a result of the Proposed Project. <b>A complete source-pathway-receptor chain for adverse effects on this habitat was identified, and it is assessed further in this NIS in Section 5.1.2.3.</b></p>	<b>Yes</b>
[1410] Mediterranean salt meadows ( <i>Juncetalia maritima</i> )	To restore the favourable conservation condition of	According to Map 12 in the Site-Specific Conservation Objectives for this SAC, the closest example of this QI habitat to the Site lies approximately 30km west of the Proposed Grid	<b>Yes</b>



Qualifying feature	Conservation Objective (NPWS, Version 1, August 2012)	Rationale	Potential for Adverse Effects
	Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) in the Lower River Shannon SAC.	<p>Connection. The SSCOs also state that further areas of this habitat that have not been surveyed may be present within the SAC. There is direct hydrological connectivity between this SAC and the Proposed Grid Connection via the several mapped watercourses.</p> <p>Therefore, following the precautionary principle, a potential pathway for significant effect on this QI was identified via the deterioration of water quality within the SAC arising from the runoff or percolation of pollutants into surface water systems during the construction and operational phases of the Proposed Project.</p> <p>Given the marine and saline nature of this habitat, there is no potential for recorded invasive species (Japanese knotweed, Giant knotweed, Giant hogweed and Rhododendron, which are entirely terrestrial) to establish within this habitat, as a result of the Proposed Project.</p> <p><b>A complete source-pathway-receptor chain for adverse effects on this habitat was identified, and it is assessed further in this NIS.</b></p>	
[3260] Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	To maintain the favourable conservation condition of Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation in the Lower River Shannon SAC.	<p>According to Map 13 in the Site-Specific Conservation Objectives for this SAC, the closest example of this QI habitat to the Proposed Project lies approximately 5km downstream of the Proposed Grid Connection Route. However, as per the SSCO, this QI habitat may not be fully mapped within the SAC.</p> <p>Taking a highly precautionary approach and considering the proximity of the proposed works to the SAC and the direct hydrological connectivity which exists via mapped watercourses, a potential pathway for adverse effects on this QI was identified via the deterioration of water quality within the SAC arising from the runoff of pollutants into surface water systems during the construction and operational phase of the Proposed Project.</p> <p><b>A complete source-pathway-receptor chain for adverse effects on this habitat was identified and it is assessed further in this NIS in Section 5.1.2.3.</b></p>	<b>Yes</b>
[6410] Molinia meadows on calcareous, peaty or clayey-	To maintain the favourable conservation condition of Molinia	The Proposed Project is located entirely outside the boundary of this SAC. Given the terrestrial nature of this QI habitat, no pathway for adverse effects was identified.	<b>No</b>



Qualifying feature	Conservation Objective (NPWS, Version 1, August 2012)	Rationale	Potential for Adverse Effects
silt-laden soils ( <i>Molinion caeruleae</i> )	meadows on calcareous, peaty or clayey-silt laden soils ( <i>Molinion caeruleae</i> ) in the Lower River Shannon SAC.	<b>No complete source- pathway- receptor chain for adverse effects on this QI habitat as a result of the Proposed Project was identified. No further assessment is required.</b>	
[91E0] *Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> )	To restore the favourable conservation condition of Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) in the Lower River Shannon SAC.	According to Map 14 in the SSCO for this SAC, the closest example of this QI habitat to the Proposed Project lies upstream of the Proposed Grid Connection Route. Therefore, due to the scale of the proposed works, and the terrestrial nature of this QI habitat, there is no potential for indirect effects on this QI habitat.  <b>No complete source- pathway- receptor chain for adverse effects on this QI habitat as a result of the Proposed Project was identified. No further assessment is required.</b>	<b>No</b>
[1029] Freshwater pearl Mussel ( <i>Margaritifera margaritifera</i> )	To restore the favourable conservation condition of Freshwater Pearl Mussel in the Lower River Shannon SAC.	According to Map 15 in the Site-Specific Conservation Objectives for this SAC, the Cloon freshwater pearl mussel population lies over approximately 40km from the Site which is also located in the Shannon Estuary North WFD Catchment and Kilrush groundwater catchment. That said, there is no direct hydrological connectivity between the Cloon freshwater pearl mussel population and the Proposed Project.  <b>No complete source- pathway- receptor chain for adverse effects on this QI habitat as a result of the Proposed Project was identified. No further assessment is required.</b>	<b>No</b>
[1095] Sea Lamprey ( <i>Petromyzon marinus</i> )	To restore the favourable conservation condition of Sea Lamprey in the Lower River Shannon SAC.	There is potential for these species to occur within the Lower Shannon SAC. There is direct hydrological connectivity between this SAC and the Proposed Grid Connection Route via several mapped watercourses.	<b>Yes</b>
[1096] Brook Lamprey ( <i>Lampetra planeri</i> )	To maintain the favourable conservation condition of Brook Lamprey in the Lower River Shannon SAC.	Therefore, taking a precautionary approach, a pathway for adverse effects on these QI species was identified via the deterioration of water quality within the SAC arising from the runoff of pollutants into surface water systems during the construction and operational phase of the Proposed Project.	<b>Yes</b>



Qualifying feature	Conservation Objective (NPWS, Version 1, August 2012)	Rationale	Potential for Adverse Effects
[1099] River Lamprey ( <i>Lampetra fluviatilis</i> )	To maintain the favourable conservation condition of River Lamprey in the Lower River Shannon SAC.	<b>A complete source-pathway-receptor chain for adverse effects on these species was identified, and it is assessed further in this NIS in Section 5.1.2.4.</b>	<b>Yes</b>
[1106] Atlantic Salmon ( <i>Salmo salar</i> )	To restore the favourable conservation condition of Salmon in the Lower River Shannon SAC.		<b>Yes</b>
[1349] Bottlenose Dolphin ( <i>Tursiops truncatus</i> )	To maintain the favourable conservation condition of Bottlenose Dolphin in the Lower River Shannon SAC.	<p>According to Map 16 in the Site-Specific Conservation Objectives for this SAC, the habitat of this QI species is mapped throughout the SAC. Furthermore, Map 16 indicates that the western extent of the Proposed Grid Connection Route lies approximately 50 km of the mapped 'Critical Habitat' for this species. However, this species is entirely marine and considering the scale and short-term nature of the works in closer proximity to this SAC, no potential for adverse effects on this QI has been identified.</p> <p><b>No complete source- pathway- receptor chain for adverse effects on this QI habitat as a result of the Proposed Project was identified. No further assessment is required.</b></p>	<b>No</b>
[1355] Otter ( <i>Lutra lutra</i> )	To restore the favourable conservation condition of Otter in the Lower River Shannon SAC.	<p>The western extent of the Proposed Grid Connection Route is located approx. 4km from this SAC. The Proposed Grid Connection Route also crosses several mapped watercourses which provide potential supporting habitat for this species.</p> <p>Therefore, taking a precautionary approach, a pathway for adverse effects on this QI species was identified via the deterioration of water quality within the SAC arising from the runoff of pollutants into surface water systems and disturbance/displacement from the construction and operational phases of the Proposed Project.</p> <p><b>A complete source-pathway-receptor chain for adverse effects on this species was identified and it is assessed further in this NIS in Section 5.1.2.4.</b></p>	<b>Yes</b>

### 5.1.2.2 Site Specific Pressures and Threats

As per the Natura 2000 Data Form, the site-specific threats, pressures, and activities with potential to impact on the Lower River Shannon SAC were reviewed and considered in relation to the Proposed Project. These are provided in Table 5-13.

*Table 5-13 Site-specific threats, pressures, and activities with potential to have effects on the Lower River Shannon SAC.*

Negative Impacts			
Rank	Threats and Pressures		Threat or pressure from Inside/Outside the SAC
Medium	E01	Urbanised areas, human habitation	Outside
Medium	K02.03	Eutrophication (natural)	Outside
Medium	J02.01.02	Reclamation of land from sea, estuary or marsh	Outside
Low	C01.01.02	Removal of beach materials	Inside
Low	F01	Marine and Freshwater Aquaculture	Inside
Medium	E03	Discharges	Outside
Medium	E03	Discharges	Inside
Low	J02.10	Management of aquatic and bank vegetation for drainage purposes	Inside
Medium	A08	Fertilization	Outside
Medium	H04	Air pollution, air-borne pollutants	Outside
Medium	A08	Fertilization	Inside
Low	F03.01	Hunting	Inside
Medium	A04	Grazing	Inside
Low	B	Sylviculture, forestry	Inside
Low	J02.12.01	Sea defence or coast protection works, tidal barrages	Inside
Low	G01.01	Nautical sports	Inside
Medium	J02.01.01	Polderisation	Inside
Low	D01.01	Paths, tracks, cycling tracks	Inside
Low	C01.03.01	Hand cutting of peat	Inside
Low	I01	Invasive non-native species	Inside

As potential impacts on water quality within this European Site, as well as the spread of invasive species, has been identified, the Proposed Project, in the absence of mitigation, can potentially contribute to the existing threats and pressures of this SAC.

### 5.1.2.3 Habitat Specific Information

#### [1130] Estuaries

According to the SSCO (NPWS, 2012), estuaries for this SAC has been mapped in detail and thus total area of the qualifying habitat is estimated at 24,273.3ha as per the Natura 2000 Data Form.

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI habitat is ‘Bad’ and the overall Conservation Trend is ‘Stable’.

There is potential for estuaries downstream of the Proposed Project to be subject to a deterioration in water quality via the indirect runoff or spillage of pollutants during construction and operation.

The targets and attributes for this QI, as per the SSCO of the SAC, are provided in Table 5-14.

Table 5-14 Targets and Attributes for [1130] Estuaries of the Lower River Shannon SAC.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Habitat area	Area stable or increasing, subject to natural processes. The permanent habitat area is stable or increasing, subject to natural processes.	No – There will be no reduction in habitat area, as a result of the Proposed Project.
Community distribution	Conserve the following community types in a natural condition: Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex; Estuarine subtidal muddy sand to mixed sediment with gammarids community complex; Subtidal sand to mixed sediment with <i>Nucula nucleus</i> community complex; Subtidal sand to mixed sediment with <i>Nephtys</i> spp. community complex; Furoid-dominated intertidal reef community complex; Faunal turf-dominated subtidal reef community; and Anemone-dominated subtidal reef community	<b>Yes</b> – Deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.

### [1310] *Salicornia* and other annuals colonizing mud and sand

According to the SSCO (NPWS, 2012), *Salicornia* and other annuals colonizing mud and sand for this SAC has been mapped in detail and thus total area of the qualifying habitat is 0.2214ha as per the Natura 2000 Data Form.

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI habitat is ‘Bad’ with a stable trend.

Taking a precautionary approach, there is potential for *Salicornia* and other annuals colonizing mud and sand downstream of the Proposed Project to be subject to a deterioration in water quality as a result of the Proposed Project.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-15.

Table 5-15 Targets and Attributes for [1310] *Salicornia* and other annuals colonizing mud and sand of the Lower River Shannon SAC.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Habitat area	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Carrigafoyle - 0.005ha; Inishdea, Owenshere - 0.003ha; Knock - 0.029ha; Querin - 0.185ha; Rinevilla Bay - 0.001ha.	No, deterioration of water quality will not undermine this target.
Habitat distribution	No decline, or change in habitat distribution, subject to natural processes.	No, deterioration of water quality will not undermine this target.
Physical structure: sediment supply	Maintain natural circulation of sediments and organic matter, without any physical obstructions	No, deterioration of water quality will not undermine this target.

Physical structure: creeks and pans	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	No, deterioration of water quality will not undermine this target.
Physical structure: flooding regime	Maintain natural tidal regime	No, deterioration of water quality will not undermine this target
Vegetation structure: zonation	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	<b>Yes</b> , Deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation structure: vegetation height	Maintain structural variation within sward	<b>Yes</b> , Deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation structure: vegetation cover	Maintain more than 90% of area outside creeks vegetated	<b>Yes</b> , Deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation composition: typical species and sub-communities	Maintain the presence of species-poor communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	<b>Yes</b> , Deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation structure: negative indicator species- <i>Spartina anglica</i>	No significant expansion of common cordgrass ( <i>Spartina anglica</i> ), with an annual spread of less than 1%	No, the Proposed Project will not undermine this target.

**[1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)**

According to the SSCO (NPWS, 2012), Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) for this SAC has been mapped in detail and thus total area of the qualifying habitat is approximately 495.434ha as per the Natura 2000 Data Form.

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI habitat is ‘Bad’ with an overall deteriorating trend.

Taking a precautionary approach, there is potential for Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) downstream of the Proposed Project to be subject to a deterioration in water quality as a result of the Proposed Project.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-16.

Table 5-16 Targets and Attributes for [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) of the Lower River Shannon SAC.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Habitat area	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Carrigafoyle- 6.774ha; Barrigone, Aughinish- 10.288ha; Beagh- 0.517ha; Bunratty- 26.939ha; Shepperton, Fergus	No, deterioration of water quality will not undermine this target

	Estuary- 37.925ha; Inishdea, Owenshere- 18.127ha; Killadysert, Inishcorker- 2.604ha; Knock- 0.576ha; Querin- 3.726ha; Rinevilla Bay- 11.883ha	
Habitat distribution	No decline or change in habitat distribution, subject to natural processes.	No, deterioration of water quality will not undermine this target
Physical structure: sediment supply	Maintain natural circulation of sediments and organic matter, without any physical obstructions	No, deterioration of water quality will not undermine this target
Physical structure: creeks and pans	Maintain creek and pan structure, subject to natural processes, including erosion and succession	No, deterioration of water quality will not undermine this target
Physical structure: flooding regime	Maintain natural tidal regime	No, deterioration of water quality will not undermine this target
Vegetation structure: zonation	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation structure: vegetation height	Maintain structural variation within sward	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation structure: vegetation cover	Maintain more than 90% of the saltmarsh area vegetated	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation composition: typical species and sub-communities	Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	Yes, deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation structure: negative indicator species- <i>Spartina anglica</i>	No significant expansion of common cordgrass ( <i>Spartina anglica</i> ), with an annual spread of less than 1%	No, deterioration of water quality will not undermine this target.

#### [1410] Mediterranean salt meadows (*Juncetalia maritimi*)

According to the SSCO (NPWS, 2012), Mediterranean salt meadows (*Juncetalia maritimi*) for this SAC has been mapped in detail and thus total area of the qualifying habitat is approximately 24.6711ha as per the Natura 2000 Data Form.

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI habitat is 'Inadequate' with an overall deteriorating trend.

Taking a precautionary approach, there is potential for Mediterranean salt meadows (*Juncetalia maritimi*) downstream of the Site to be subject to a deterioration of water quality via the direct or indirect runoff or spillage of pollutants during the construction and operational phase due to the Proposed Project being directly adjacent to this SAC.

The targets and attributes for this QI, as per the SSCO's of the SAC, are provided in Table 5-17.

Table 5-17 Targets and Attributes associated with nominated site-specific conservation objectives for Mediterranean salt meadows in the Lower River Shannon SAC

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Habitat area	Area increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Carrigafoyle- 4.193ha; Barrigone, Aughinish- 2.407ha; Bunratty- 0.865ha; Inishdea, Owenshere- 11.609ha; Killadysert, Inishcorker- 0.705ha; Knock- 0.143ha, Querin- 0.008ha; Rinevilla Bay- 2.449ha.	No, deterioration of water quality will not undermine this target.
Habitat distribution	No decline or change in habitat distribution, subject to natural processes.	No, deterioration of water quality will not undermine this target.
Physical structure: sediment supply	Maintain natural circulation of sediments and organic matter, without any physical obstructions	No, deterioration of water quality will not undermine this target.
Physical structure: creeks and pans	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	No, deterioration of water quality will not undermine this target.
Physical structure: flooding regime	Maintain natural tidal regime	No – The Proposed Project will not have effect on flooding or tidal regimes.
Vegetation structure: zonation	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation structure: vegetation height	Maintain structural variation within sward	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation structure: vegetation cover	Maintain more than 90% of area outside creeks vegetated	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation composition: typical species	Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation structure: negative indicator species - <i>Spartina anglica</i>	No significant expansion of common cordgrass ( <i>Spartina anglica</i> ), with an annual spread of less than 1%	No, deterioration of water quality will not undermine this target.

[3260] Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation

According to the SSCO (NPWS, 2012), Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation for this SAC has not been mapped in detail and thus total area of the qualifying habitat is unknown.

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI habitat is ‘Inadequate’ with an overall deteriorating trend.

Taking a precautionary approach, there is potential for water courses of plain to montane levels with *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation downstream of the Proposed Project to be subject to a deterioration of water quality via the direct or indirect runoff or spillage of pollutants during the construction and operational phase due to the Proposed Project being directly adjacent to this SAC.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-18.

*Table 5-18 Targets and Attributes associated with nominated sites-specific conservation objectives for Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation in the Lower River Shannon SAC.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Habitat area	Area stable or increasing, subject to natural processes	No, the Proposed Project will not undermine this target.
Habitat distribution	No decline, subject to natural processes	No, the Proposed Project will not undermine this target.
Hydrological regime: river flow	Maintain appropriate hydrological regimes	No, the Proposed Project will not undermine this target.
Hydrological regime: tidal influence	Maintain natural tidal regime	No, the Proposed Project will not undermine this target.
Hydrological regime: freshwater seepage	Maintain appropriate freshwater seepage regimes	No, the Proposed Project will not undermine this target.
Substratum composition: particle size range	The substratum should be dominated by the particle size ranges, appropriate to the habitat sub-type (frequently sands, gravels and cobbles)	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target.
Water quality: nutrients	The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation composition: typical species	Typical species of the relevant habitat sub-type should be present and in good condition	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Floodplain connectivity	The area of active floodplain at and upstream of the habitat should be maintained	No, the Proposed Project will not undermine this target.
Riparian habitat	The area of riparian woodland at and upstream of the bryophyte-rich sub-type should be maintained	No, the Proposed Project will not undermine this target.

## 5.1.2.4 Species Specific Information

### [1095] Sea Lamprey (*Petromyzon marinus*)

According to the SSCO (NPWS, 2012), with respect to the distribution of this species within the SAC, artificial barriers can block or cause difficulties to lampreys' upstream migration, thereby limiting the species to lower stretches and restricting access to spawning areas. The upper extent of the SAC in the River Fergus is delineated by a barrier to migration. Barriers are also present in the Mulkear and Feale rivers.

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI species is 'Bad' with a deteriorating trend. The sea lamprey is listed in the most recent Irish Red Data Book as Near Threatened. Barriers to upstream migration (e.g. weirs) are considered the major impediment to good conservation status for sea lamprey as these limit access to spawning beds and juvenile habitat.

Taking a precautionary approach there is potential for deterioration of water quality to impact on sea lamprey which may occur downstream of the Proposed Project.

The targets and attributes for this QI, as per the SSCO of the SAC, are provided in Table 5-19.

*Table 5-19 Targets and Attributes [1095] Sea Lamprey of the Lower River Shannon SAC.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Distribution: extent of anadromy	Greater than 75% of main stem length of rivers accessible from estuary	No, the Proposed Project will not undermine this target and will not result in any barriers of connectivity
Population structure of juveniles	At least three age/size groups present	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey
Juvenile density in fine sediment	At least three age/size groups present	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat
Availability of juvenile habitat	More than 50% of sample sites positive	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat

### [1096] Brook Lamprey (*Lampetra planeri*)

According to the SSCO (NPWS, 2012), artificial barriers can block or cause difficulties to brook lampreys' migration, both up- and downstream, thereby possibly limiting the species to specific stretches and creating genetically isolated populations (Espanhol et al., 2007).

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI species is 'Favourable'.

Taking a precautionary approach there is potential for deterioration of water quality to impact on brook lamprey which may occur downstream of the Proposed Project.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-20.

*Table 5-20 Targets and Attributes [1096] Brook Lamprey of the Lower River Shannon SAC.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Distribution	Access to all water courses down to first order streams	No, the Proposed Project will not undermine this target as will not result in any barriers of connectivity.
Population structure of juveniles	At least three age/size groups of river/brook lamprey present	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey.
Juvenile density in fine sediment	Mean catchment juvenile density of river/brook lamprey at least 2/m <sup>2</sup>	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey.
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat.
Availability of juvenile habitat	More than 50% of sample sites positive	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat.

### [1099] River Lamprey (*Lampetra fluviatilis*)

According to the SSCO (NPWS, 2012), artificial barriers can block or cause difficulties to river lampreys' migration, both up- and downstream, thereby possibly limiting species to specific stretches and creating genetically isolated populations (Espanhol et al., 2007).

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI species is 'Inadequate'. This is largely due to the inability to distinguish between river lamprey and brook lamprey larvae, and the challenges associated with sampling for adult river lamprey, which means that an evaluation of their actual range and population size cannot be undertaken.

Taking a precautionary approach there is potential for deterioration of water quality to impact on river lamprey which may occur downstream of the Proposed Project.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-21.

*Table 5-21 Targets and Attributes [1099] River Lamprey of the Lower River Shannon SAC.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
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Distribution: extent of anadromy	Access to all water courses down to first order streams	No, the Proposed Project will not undermine this target as it will not result in any barriers of connectivity.
Population structure of juveniles	At least three age/size groups of river/brook lamprey present	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey.
Juvenile density in fine sediment	Mean catchment juvenile density of river/brook lamprey at least 2/m <sup>2</sup>	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target via deterioration of supporting habitat and reduced prey.
Out-migrating smolt abundance	No significant decline	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat.
Availability of juvenile habitat	More than 50%	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target via deterioration of supporting habitat.

### [1106] Salmon (*Salmo salar*)

According to the SSCO (NPWS, 2012), with respect to the distribution of this QI species within the SAC, artificial barriers block salmon's upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. The large hydro-electric station at Ardnacrusha and the Parteen regulating weir present considerable obstructions to upstream passage of salmon on the Shannon main channel. While both have fish passes installed, upstream migration of salmon is still problematic. Further weirs upstream on the Shannon also restrict access to spawning habitat. No such obstacles, causing significant fish passage issues for salmon are present on the Feale and Mulkear rivers.

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI species is 'Bad' and the overall Conservation Trend is 'Deteriorating'.

Taking a precautionary approach there is potential for deterioration of water quality to impact on salmon which may occur downstream of the Proposed Project.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-22.

Table 5-22 Targets and Attributes [1106] Salmon (*Salmo salar*) of the Lower River Shannon SAC.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Distribution: extent of anadromy	100% of river channels down to second order accessible from estuary	No, the Proposed Project will not undermine this target.
Adult spawning fish	Conservation limit (CL) for each system consistently exceeded	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.

Salmon fry abundance	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Out-migrating smolt abundance	No significant decline	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Number and distribution of redds	No decline in number and distribution of spawning redds due to anthropogenic causes	<b>Yes</b> , silt laden runoff from the Proposed Project could undermine this target.
Water quality	At least Q4 at all sites sampled by EPA	<b>Yes</b> , Deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.

### [1355] Otter (*Lutra lutra*)

According to the SSCO (NPWS, 2012), the area of terrestrial habitat is mapped and calculated as approximately 596.8ha. The length of freshwater (river) habitat was mapped and calculated as approximately 500.1 km, which was calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982). The area of freshwater (lake) habitat was mapped and calculated as 125.6ha, based on evidence that otters tend to forage within 80 metres of the shoreline (NPWS, 2007).

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI species is 'Favourable' and the overall Conservation Trend is 'Stable'.

Taking a precautionary approach there is potential for deterioration of water quality to impact on otter, via reduced prey availability, which may occur downstream of the Proposed Project. Furthermore, given there is a requirement for watercourse crossings, there is potential for disturbance/displacement to this species in the vicinity of such works.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-23.

*Table 5-23 Targets and Attributes [1355] Otter (Lutra lutra) of the Lower River Shannon SAC.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Distribution	No significant decline	No, the Proposed Project will not undermine this target.
Extent of terrestrial habitat	No significant decline. Area mapped and calculated as 596.8ha above high water mark; 958.9ha along riverbanks/around ponds	No, the Proposed Project will not undermine this target.
Extent of marine habitat	No significant decline. Area mapped and calculated as 4,461.6ha	No, the Proposed Project will not undermine this target.
Extent of freshwater (river) habitat	No significant decline. Length mapped and calculated as 500.1km	No, the Proposed Project will not undermine this target.
Extent of freshwater (lake/lagoon) habitat	No significant decline. Area mapped and calculated as 125.6ha	No, the Proposed Project will not undermine this target.

Couching sites and holts	No significant decline	No, the Proposed Project will not undermine this target.
Fish biomass available	No significant decline	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Barriers to connectivity	No significant increase	No, the Proposed Project will not undermine this target.

### 5.1.3 Philipston Marsh SAC (001847)

The potential for impacts on this SAC was identified in Section 4.1 above. The identified pathways for effect include the following:

- › Deterioration of water quality via the direct and indirect runoff or spillage of pollutants during the construction phase of the Proposed Project due to the hydrological connectivity between the Proposed Wind Farm Site and this SAC, in addition to the Grid Connection Route component of the Proposed Project directly overlapping with portions of this SAC.
- › Indirect effects due to the spread of invasive species, which included Giant Hogweed, Japanese Knotweed, Giant Knotweed, and Rhododendron as a result of the Proposed Project.

The Site-Specific Conservation Objectives (SSCOs) document and Natura 2000 Data Form for this designated site were reviewed during this assessment and can be found at the following online locations:

**SSCOs:** [https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO001847.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001847.pdf)  
Accessed the 25<sup>th</sup> of November 2025

**Natura 2000 Data Form:**  
<https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0001847&release=55> Accessed the 25<sup>th</sup> of November 2025

Table 5-24 below lists the qualifying features of this European Site and determines, in the light of their Conservation Objectives, whether there is any complete source-pathway-receptor chain, by which adverse effects may occur.



### 5.1.3.1 Identification of Individual Qualifying Features with the Potential to be Affected.

Table 5-24 Assessment of Qualifying features of Philipston Marsh SAC [001847] potentially affected.

Qualifying feature	Conservation Objective (NPWS, Version 1, January 2018)	Rationale	Potential for Adverse Effects
[7140] Transition mires and quaking bogs	To maintain the favourable conservation condition of Transition mires and quaking bogs in Philipston Marsh SAC.	<p>According to Map 1 in the Site-Specific Conservation Objectives for this SAC, the closest example of this QI habitat lies approx. 1 km downstream of the Proposed Grid Connection underground cabling route located to the south. Transition mires and quaking bogs has not been mapped in detail for Philipston Marsh SAC and thus the total area of the qualifying habitat in the SAC is unknown.</p> <p>Therefore, following the precautionary principle, a potential pathway for significant effect on this QI was identified via the deterioration of water quality within the SAC arising from the runoff or percolation of pollutants into surface water and groundwater systems during the construction phase of the Proposed Project.</p> <p><b>A complete source-pathway-receptor chain for adverse effects on this habitat was identified, and it is assessed further in this NIS in Section 5.1.3.3.</b></p>	<b>Yes</b>

### 5.1.3.2 Site Specific Pressures and Threats

As per the Natura 2000 Data Form, the site-specific threats, pressures, and activities with potential to impact on the European Site were reviewed and considered in relation to the Proposed Project. These are provided in Table 5-25.

*Table 5-25 Site-specific threats, pressures, and activities with potential to have effects on Philipston Marsh SAC.*

Negative Impacts			
Rank	Threats and Pressures		Inside/Outside
Low	B	Sylviculture, forestry	Outside
Low	A08	Fertilisation	Outside
Low	A04	Grazing	Inside
Medium	A04	Grazing	Outside

No works associated with any phase of the Proposed Project have the potential to contribute the above listed threats.

### 5.1.3.3 Habitat Specific Information

#### [7140] Transition mires and quaking bogs

According to the SSCO (NPWS, 2018), transition mires and quaking bogs habitat for this SAC has been mapped in detail and thus total area of the qualifying habitat is 0.75 ha as per the Natura 2000 Data Form.

According to the Article 17 Report (NPWS, 2025), the overall Conservation Status for this QI habitat is ‘Bad’ with a deteriorating trend.

Taking a precautionary approach, there is potential for transition mires and quaking bogs downstream of the Proposed Project to be subject to a deterioration of water quality via the direct or indirect runoff or spillage and percolation of pollutants into surface water and groundwater systems during construction due to the Proposed Project being adjacent to this SAC.

The targets and attributes for this QI, as per the SSCOs of the SAC, are provided in Table 5-26.

*Table 5-26 Targets and Attributes for [7140] transition mires and quaking bogs of Philipston Marsh SAC.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Habitat area	Area stable or increasing, subject to natural processes	No, the Proposed Project will not undermine this target.
Habitat distribution	No decline, subject to natural processes	No, the Proposed Project will not undermine this target.
Ecosystem function: soil nutrients	Maintain soil pH and nutrient status within natural ranges	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.

Ecosystem function: peat formation	Maintain active peat formation, where appropriate	No, the Proposed Project will not undermine this target.
Ecosystem function: hydrology - water levels	Maintain appropriate water levels necessary to support the natural structure and functioning of the habitat	No, the Proposed Project will not undermine this target.
Ecosystem function: hydrology - flow patterns	Maintain appropriate topography and water movement regime necessary to support the natural structure and functioning of the habitat	No, the Proposed Project will not undermine this target.
Ecosystem function: water quality	Maintain appropriate water quality to support the natural structure and functioning of the habitat	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Community diversity	Maintain variety of vegetation communities, subject to natural processes	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation composition: typical vascular plants and bryophytes	Maintain adequate cover of typical vascular plant and bryophyte species	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation composition: native negative indicator species	Native negative indicator species at insignificant levels	No, the Proposed Project will not undermine this target.
Vegetation composition: non-native species	Cover of non-native species less than 1%	No, the Proposed Project will not undermine this target.
Physical structure: drainage	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	No, the Proposed Project will not undermine this target.
Physical structure: disturbed bare ground	Cover of disturbed bare ground not more than 10%	No, the Proposed Project will not undermine this target.
Indicators of local distinctiveness	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat; maintain features of local distinctiveness, subject to natural processes	<b>Yes</b> , deterioration of water quality as a result of silt-laden run-off and other pollutants could undermine this target.

5.1.4

## Slievefelim to Silvermines Mountains SPA (004165)

The potential for impacts on this SPA was identified in Section 4.1 above. The identified pathways for effect include the following:

- › Given the Proposed Project in parts is within the 10 km maximum foraging range (SNH, 2016) for the single SCI of this SPA, hen harrier, there is potential for disturbance/displacement of this species as a result of the Proposed Project.
- › Given the Proposed Project is within the maximum foraging range of hen harrier, potential exists for *ex-situ* habitat loss.
- › Given the Proposed Project is within the maximum foraging range of hen harrier, potential exists for collision risk with the proposed Wind Farm infrastructure.

The Site-Specific Conservation Objectives (SSCOs) document and Natura 2000 Data Form for this designated site were reviewed during this assessment and can be found at the following online locations:

**SSCOs:** [https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO004165.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004165.pdf)

Accessed the 25<sup>th</sup> of November 2025

**Natura 2000 Data Form:**

<https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0004165&release=55> Accessed the 25<sup>th</sup> of

November 2025

Table 5-27 below lists the qualifying features of this European Site and determines, in the light of their Conservation Objectives, whether there is any complete source-pathway-receptor chain, by which adverse effects may occur.



5.1.4.1 Identification of Individual Qualifying Features with the Potential to be Affected.

Table 5-27 Assessment of Qualifying features of Slievefelim to Silvermines Mountains SPA [004165] potentially affected.

Qualifying feature	Conservation Objective (NPWS, Version 1, September 2022)	Rationale	Potential for Adverse Effects
[A092] Hen Harrier ( <i>Circus cyaneus</i> )	To restore the favourable conservation condition of hen harrier in Slievefelim to Silvermines Mountains SPA.	<p>The Proposed Wind Farm site is located approximately 10km northwest from Slievefelim to Silvermines Mountains SPA, which lies outside the core foraging range (2km) but within the maximum foraging range (10km) for hen harrier (SNH, 2016).</p> <p>However, as per <b>Appendix 1</b>, no significant recordings (breeding sites or large numbers) of hen harrier was recorded during the targeted bird surveys of the Proposed Wind Farm site, and therefore no significant potential for adverse effects are anticipated during either the construction, operational, or decommissioning phases of the Proposed Project, as a result of <i>ex-situ</i> disturbance/displacement, <i>ex-situ</i> habitat loss, or mortality due to collision risk within the wind farm site.</p> <p><b>No complete source- pathway- receptor chain for adverse effects on this SCI species as a result of the Proposed Project was identified. No further assessment is required.</b></p>	<b>No</b>

### 5.1.4.2 Site Specific Pressures and Threats

As per the Natura 2000 Data Form, the site-specific threats, pressures, and activities with potential to impact on Slievefelim to Silvermines Mountains SPA were reviewed and considered in relation to the Proposed Project. These are provided in Table 5-28.

Table 5-28 Site-specific threats, pressures, and activities with potential to have effects on Slievefelim to Silvermines Mountains SPA.

Negative Impacts			
Rank	Threats and Pressures		Inside/Outside
Medium	C01.03	Peat extraction	Inside
Low	D01.02	Roads, motorways	Inside
High	B	Sylviculture, forestry	Inside
Medium	A04	Grazing	Inside
Low	E01.03	Dispersed habitation	Inside
Low	D01.01	Paths, tracks, cycling tracks	Inside

No works associated with any phase of the Proposed Project have the potential to contribute the above listed threats.

5.1.5

## River Shannon and River Fergus Estuaries SPA (004077)

The potential for impacts on this SPA was identified in Section 4.1 above. The identified pathways for effect include the following:

- › Deterioration of water quality via the indirect runoff or spillage of pollutants during construction due to the Proposed Project being hydrologically connected to this SPA.
- › Given the close proximity of the SPA to the Proposed Grid Connection component of the Proposed Project, there is potential for disturbance/displacement to SCIs of the SPA during the construction phase of the Proposed Project.
- › Indirect effects due to the spread of invasive species, which included Giant Hogweed, Japanese Knotweed, Giant Knotweed, and Rhododendron as a result of the Proposed Project.

The Site-Specific Conservation Objectives (SSCOs) document and Natura 2000 Data Form for this designated site were reviewed during this assessment and can be found at the following online locations:

**SSCOs:** [https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO004077.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf)

Accessed the 25<sup>th</sup> of November 2025

**Natura 2000 Data Form:**

<https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0004077&release=55> Accessed the 25<sup>th</sup> of November 2025

Table 5-30 below lists the qualifying features of this European Site and determines, in the light of their Conservation Objectives, whether there is any complete source-pathway-receptor chain, by which adverse effects may occur.



### 5.1.5.1 Identification of Individual Qualifying Features with the Potential to be Affected.

Table 5-29 Assessment of Qualifying features of the River Shannon and Fergus Estuaries SPA (004077) potentially affected.

Qualifying feature	Conservation Objective (NPWS, Version 1, September 2012),	Rationale	Potential for Adverse Effects
[A017] Cormorant ( <i>Phalacrocorax carbo</i> )	To maintain the favourable conservation condition of Cormorant in the River Shannon and River Fergus Estuaries SPA	No significant supporting wetland habitat for any SCI of the SPA was recorded within or adjacent to the Proposed Project. The Proposed Grid Connection underground cabling route, will be installed primarily within the existing road, which does not provide significant supporting habitat for the SCIs of the SPA. Therefore, no potential for adverse effects exists on these SCIs, as a result of <i>ex-situ</i> disturbance/displacement.	Yes
[A038] Whooper Swan ( <i>Cygnus cygnus</i> )	To maintain the favourable conservation condition of Whooper Swan in the River Shannon and River Fergus Estuaries SPA	<p>The Proposed Project is hydrologically connected to the SPA and taking a precautionary approach, it was considered that the Proposed Project has the potential to undermine the favourable conservation status of the SCI species through a deterioration of water quality during the construction of the Proposed Project. A deterioration of water quality has the potential to result in habitat degradation and reduced prey availability which could have overall implications for maintaining or restoring favourable conservation status for these SCI species.</p> <p><b>Therefore, a complete source-pathway-receptor chain for adverse effects on the SCIs of the SPA was identified, and it is assessed further in this NIS in Section 5.2.5.3.</b></p>	Yes
[A046] Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> )	To maintain the favourable conservation condition of Light-bellied Brent Goose in the River Shannon and River Fergus Estuaries SPA		Yes
[A048] Shelduck ( <i>Tadorna tadorna</i> )	To maintain the favourable conservation condition of Shelduck in the River Shannon and River Fergus Estuaries SPA		Yes
[A050] Wigeon ( <i>Anas Penelope</i> )	To maintain the favourable conservation condition of Wigeon in the River Shannon and River Fergus Estuaries SPA		Yes



Qualifying feature	Conservation Objective (NPWS, Version 1, September 2012),	Rationale	Potential for Adverse Effects
[A052] Teal ( <i>Anas crecca</i> )	To maintain the favourable conservation condition of Teal in the River Shannon and River Fergus Estuaries SPA		Yes
[A054] Pintail ( <i>Anas acuta</i> )	To maintain the favourable conservation condition of Pintail in the River Shannon and River Fergus Estuaries SPA		Yes
[A056] Shoveler ( <i>Anas clypeata</i> )	To maintain the favourable conservation condition of Shoveler in the River Shannon and River Fergus Estuaries SPA		Yes
[A062] Scaup ( <i>Aythya marila</i> )	To maintain the favourable conservation condition of Scaup in the River Shannon and River Fergus Estuaries SPA		Yes
[A137] Ringed Plover ( <i>Charadrius hiaticula</i> )	To maintain the favourable conservation condition of Ringed Plover in the River Shannon and River Fergus Estuaries SPA		Yes
[A140] Golden Plover ( <i>Pluvialis apricaria</i> )	To maintain the favourable conservation condition of Golden Plover in the River Shannon and River Fergus Estuaries SPA		Yes



Qualifying feature	Conservation Objective (NPWS, Version 1, September 2012),	Rationale	Potential for Adverse Effects
[A141] Grey Plover ( <i>Pluvialis squatarola</i> )	To maintain the favourable conservation condition of Grey Plover in the River Shannon and River Fergus Estuaries SPA		Yes
[A142] Lapwing ( <i>Vanellus vanellus</i> )	To maintain the favourable conservation condition of Lapwing in the River Shannon and River Fergus Estuaries SPA		Yes
[A143] Knot ( <i>Calidris canutus</i> )	To maintain the favourable conservation condition of Knot in the River Shannon and River Fergus Estuaries SPA		Yes
[A149] Dunlin ( <i>Calidris alpina</i> )	To maintain the favourable conservation condition of Dunlin in the River Shannon and River Fergus Estuaries SPA		Yes
[A156] Black-tailed Godwit ( <i>Limosa limosa</i> )	To maintain the favourable conservation condition of Black-tailed Godwit in the River Shannon and River Fergus Estuaries SPA		Yes
[A157] Bar-tailed Godwit ( <i>Limosa lapponica</i> )	To maintain the favourable conservation condition of Bar-tailed Godwit in the River Shannon and River Fergus Estuaries SPA		Yes



Qualifying feature	Conservation Objective (NPWS, Version 1, September 2012),	Rationale	Potential for Adverse Effects
[A160] Curlew ( <i>Numenius arquata</i> )	To maintain the favourable conservation condition of Curlew in the River Shannon and River Fergus Estuaries SPA		Yes
[A162] Redshank ( <i>Tringa tetanus</i> )	To maintain the favourable conservation condition of Redshank in the River Shannon and River Fergus Estuaries SPA		Yes
[A164] Greenshank ( <i>Tringa nebularia</i> )	To maintain the favourable conservation condition of Greenshank in the River Shannon and River Fergus Estuaries SPA		Yes
[A179] Black-headed Gull ( <i>Chroicocephalus ridibundus</i> )	To maintain the favourable conservation condition of Black-headed Gull in the River Shannon and River Fergus Estuaries SPA		Yes
[A999] Wetlands	To maintain the favourable conservation condition of the wetland habitat in the River Shannon and River Fergus Estuaries SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.	<p>Following the precautionary principle, a potential pathway for significant indirect effect on supporting habitat for the SCIs of the SPA was identified via the deterioration of water quality within the SPA, arising from the runoff or percolation of pollutants into surface water during the construction phase of the Proposed Project.</p> <p><b>Therefore, a complete source-pathway-receptor chain for adverse effects on supporting wetland habitat for the SCIs of the SPA was identified and it is assessed further in this NIS in Section 5.2.5.4.</b></p>	Yes

### 5.1.5.2 Site Specific Pressures and Threats

As per the Natura 2000 Data Form, the site-specific threats, pressures, and activities with potential to impact on the River Shannon and River Fergus Estuaries SPA were reviewed and considered in relation to the Proposed Project. These are provided in Table 5-31.

Table 5-30 Site-specific threats, pressures, and activities with potential to have effects on the River Shannon and River Fergus Estuaries SPA.

Negative Impacts			
Rank	Threats and Pressures		Threat or pressure from Inside/Outside the SAC
M	A04	Grazing	Inside
M	G01.02	Walking, horseriding and non-motorised vehicles	Inside
M	A04	Grazing	Outside
M	G01.01	Nautical sports	Inside
M	F02.03	Leisure fishing	Inside

Rank: H = high, M = medium, L = low

No works associated with any phase of the Proposed Project have the potential to contribute the above listed threats

### 5.1.5.3 Special Conservation Interests' Specific Information

#### [A017] Cormorant (*Phalacrocorax carbo*)

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the all-Ireland population of Cormorant (*Phalacrocorax carbo*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 245 individuals. Recent data indicates that numbers have decreased within the SPA to 237 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1987-2012) is increasing for this SCI species.

Taking a precautionary approach there is potential for the deterioration of supporting aquatic foraging habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Proposed Project to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-32.

Table 5-31 Targets and attributes associated with nominated site-specific conservation objectives for cormorant in River Shannon and River Fergus Estuaries SPA.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Breeding population abundance: apparently occupied nests (AONs)	No significant decline	No (changes to breeding site abundance as a result of the Proposed Project will not occur).

Productivity rate	No significant decline	<b>Yes</b> - habitat degradation as a result of silt-laden run-off and other pollutants or disturbance could undermine this target.
Distribution: breeding colonies	No significant decline	No (disturbance on breeding colonies as a result of the Proposed Project will not occur).
Prey biomass available	No significant decline	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Barriers to connectivity	No significant increase	No (no barriers to connectivity as a result of the Proposed Project will not occur).
Disturbance at breeding site	Human activities should occur at levels that do not adversely affect the breeding cormorant population	<b>Yes</b> – Construction of the Proposed Project has the potential to disturb this species at breeding sites
Population trend	Long term population trend stable or increasing	<b>Yes</b> - habitat degradation as a result of silt-laden run-off and other pollutants or disturbance could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by cormorant other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of construction works could cause displacement which could lead to changes in the use of areas by this species within the SPA.

### [A038] Whooper Swan (*Cygnus cygnus*)

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the all-Ireland population of the Annex I species Whooper Swan (*Cygnus cygnus*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 118 individuals. Recent data indicates that numbers have increased within the SPA to 269 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1986-2010) is increasing for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-33.

*Table 5-32 Targets and attributes associated with the conservation objectives for Whooper Swan in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
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Population trend	Long term population trend stable or increasing	<b>Yes</b> - habitat degradation as a result of silt-laden run-off and other pollutants or disturbance could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by whooper swan other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

**[A046] Light-bellied Brent Goose (*Branta bernicla hrota*)**

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the biogeographical population of Light-bellied Brent Goose (*Branta bernicla hrota*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 494 individuals. Recent data indicates that numbers have decreased within the SPA to 176 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1987-2011) is decreasing for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-34.

*Table 5-33 Targets and attributes associated with the conservation objective for Light-bellied Brent Goose in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by light-bellied brent goose other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

**[A048] Shelduck (*Tadorna tadorna*)**

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the all-Ireland population of Shelduck (*Tadorna tadorna*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was

1,025 individuals. Recent data indicates that numbers have decreased within the SPA to 291 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1980-2011) is unknown for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-35.

Table 5-34 Targets and attributes associated with the conservation objective for Shelduck in River Shannon and River Fergus Estuaries SPA.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by shelduck other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

#### [A050] Wigeon (*Anas Penelope*)

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the all-Ireland population of Wigeon (*Anas penelope*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 3,761 individuals. Recent data indicates that numbers have decreased within the SPA to 1,821 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1987-2011) is decreasing for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-36.

Table 5-35 Targets and attributes associated with the conservation objective for Wigeon in River Shannon and River Fergus Estuaries SPA.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by wigeon other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

[A052] Teal (*Anas crecca*)

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the all-Ireland population of Teal (*Anas crecca*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 2,260 individuals. Recent data indicates that numbers have decreased within the SPA to 812 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1972-2011) is decreasing for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-37.

Table 5-36 Targets and attributes associated with the conservation objective for Teal in River Shannon and River Fergus Estuaries SPA.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by teal other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

### [A054] Pintail (*Anas acuta*)

As per the conservation objectives supporting document for the SPA (NPWS, 2012), Pintail (*Anas acuta*) was recorded in numbers of all-Ireland importance during the baseline period (1995/96 – 1999/00), at 62 individuals. Recent data indicates that numbers have decreased within the SPA to 30 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1987-2011) is unknown for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-38.

*Table 5-37 Targets and attributes associated with the conservation objective for Pintail in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by pintail other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

### [A056] Shoveler (*Anas clypeata*)

As per the conservation objectives supporting document for the SPA (NPWS, 2012), Shoveler (*Anas clypeata*) was recorded in numbers of all-Ireland importance during the baseline period (1995/96 – 1999/00), at 107 individuals. Recent data indicates that numbers have decreased within the SPA to 45 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1980-2011) is increasing for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-39.

Table 5-38 Targets and attributes associated with the conservation objective for Shoveler in River Shannon and River Fergus Estuaries SPA.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by shoveler other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

### [A062] Scaup (*Aythya marila*)

As per the conservation objectives supporting document for the SPA (NPWS, 2012), Scaup (*Aythya marila*) was recorded in numbers of all-Ireland importance during the baseline period (1995/96 – 1999/00), at 102 individuals. Recent data indicates that numbers have decreased within the SPA to 24 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1980-2011) is unknown for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-40.

Table 5-39 Targets and attributes associated with the conservation objective for Scaup in River Shannon and River Fergus Estuaries SPA.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by scaup other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

**[A137] Ringed Plover (*Charadrius hiaticula*)**

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1 % or more of the all-Ireland population of Ringed Plover (*Charadrius hiaticula*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 223 individuals. Recent data indicates that numbers have decreased within the SPA to 92 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1999-2011) is unknown for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-41.

*Table 5-40 Targets and attributes associated with the conservation objective for Ringed Plover in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by ringed plover other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

**[A140] Golden Plover (*Pluvialis apricaria*)**

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the all-Ireland population of the Annex I species Golden Plover (*Pluvialis apricaria*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 5,664 individuals. Recent data indicates that numbers have decreased within the SPA to 1,929 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1987-2011) is unknown for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA

and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-432.

*Table 5-41 Targets and attributes associated with the conservation objective for Golden Plover in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by golden plover other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

#### [A141] Grey Plover (*Pluvialis squatarola*)

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the all-Ireland population of Grey Plover (*Pluvialis squatarola*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 558 individuals. Recent data indicates that numbers have decreased within the SPA to 69 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1987-2011) is unknown for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-43.

*Table 5-42 Targets and attributes associated with the conservation objective for Grey Plover in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could

	areas by grey plover other than that occurring from natural patterns of variation	undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.
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**[A142] Lapwing (*Vanellus vanellus*)**

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the all-Ireland population of Lapwing (*Vanellus vanellus*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 15,126 individuals. Recent data indicates that numbers have decreased within the SPA to 2,012 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1987-2011) is decreasing for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-44.

*Table 5-43 Targets and attributes associated with the conservation objective for Lapwing in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by lapwing other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

**[A143] Knot (*Calidris canutus*)**

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the all-Ireland population of Knot (*Calidris canutus*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 2,015 individuals. Recent data indicates that numbers have decreased within the SPA to 2,012 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1987-2011) is unknown for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-45.

*Table 5-44 Targets and attributes associated with the conservation objective for Knot in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by knot other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

#### [A149] Dunlin (*Calidris alpina*)

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the biogeographic population of Dunlin (*Calidris alpina*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 15,131 individuals. Recent data indicates that numbers have decreased within the SPA to 2,012 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1987-2011) is decreasing for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-46.

*Table 5-45 Targets and attributes associated with the conservation objective for Dunlin in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.

Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by dunlin other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.
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**[A156] Black-tailed Godwit (*Limosa limosa*)**

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the biogeographical population of Black-tailed Godwit (*Limosa limosa*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 2,035 individuals. Recent data indicates that numbers have decreased within the SPA to 2,012 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS 2019), the long-term population trend (1987-2011) is increasing for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-47.

*Table 5-46 Targets and attributes associated with the conservation objective for Black-tailed Godwit in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by black-tailed godwit other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

**[A157] Bar-tailed Godwit (*Limosa lapponica*)**

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the all-Ireland population of the Annex I species Bar-tailed Godwit (*Limosa lapponica*). The mean peak number within the SPA during the baseline period (1995/96 – 1999/00) was 460 individuals. Recent data indicates that numbers have decreased within the SPA to 72 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS, 2019), the long-term population trend (1987-2011) is decreasing for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-48.

*Table 5-47 Targets and attributes associated with the conservation objective for Bar-tailed Godwit in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

#### [A160] Curlew (*Numenius arquata*)

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the all-Ireland population of Curlew (*Numenius arquata*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 2,396 individuals. Recent data indicates that numbers have decreased within the SPA to 2,012 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS, 2019), the long-term population trend (1987-2011) is decreasing for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-49.

*Table 5-48 Targets and attributes associated with the conservation objective for Curlew in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
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Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by curlew other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

### [A162] Redshank (*Tringa totanus*)

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the all-Ireland population of Redshank (*Tringa totanus*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 2,645 individuals. Recent data indicates that numbers have decreased within the SPA to 2,012 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS, 2019), the long-term population trend (1972-2008) is decreasing for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-50.

*Table 5-49 Targets and attributes associated with the conservation objective for Redshank in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by redshank other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

**[A164] Greenshank (*Tringa nebularia*)**

As per the conservation objectives supporting document for the SPA (NPWS, 2012), during winter the SPA regularly supports 1% or more of the all-Ireland population of Greenshank (*Tringa nebularia*). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 61 individuals. Recent data indicates that numbers have decreased within the SPA to 30 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS, 2019), the long-term population trend (1987-2011) is increasing for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-51.

*Table 5-50 Targets and attributes associated with the conservation objective for Greenshank in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by greenshank other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

**[A179] Black-headed Gull (*Larus ridibundus*)**

As per the conservation objectives supporting document for the SPA (NPWS, 2012), Black-headed Gull (*Larus ridibundus*) was recorded in numbers of all-Ireland importance during the baseline period (1995/96 – 1999/00), at 2,681 individuals. Recent data indicates that numbers have decreased within the SPA to 1,303 individuals (2006/07 – 2010/11).

According to the Article 12 Report (NPWS, 2019), the long-term population trend (1980-2011) is unknown for this SCI species.

Taking a precautionary approach there is potential for the deterioration of foraging aquatic habitat for this species within the SPA to occur downstream of the Site resulting in potential for adverse effects on this species via a deterioration in water quality. Additionally, given the proximity of the Site to this SPA and suitable habitat for this species, there is potential for adverse effects as a result of disturbance/displacement as a result of the construction phase.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-52.

*Table 5-51 Targets and attributes associated with the conservation objective for Black-headed Gull in River Shannon and River Fergus Estuaries SPA.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Population trend	Long term population trend stable or increasing	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by black-headed gull other than that occurring from natural patterns of variation	<b>Yes</b> - deterioration in water quality and habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target. Disturbance as a result of the construction phase could cause displacement which could lead to changes in the use of areas by this species within the SPA.

### [A999] Wetlands and Waterbirds

According to the site-specific conservation objectives the extent of wetland habitat within the SPA was estimated as 32,261ha, using OSI data and relevant orthophotographs (NPWS, 2012). The following relevant extracts have been gleaned from the NPWS site synopsis and Natura 2000 Data Form for the SPA:

*‘The estuaries of the River Shannon and River Fergus form the largest estuarine complex in Ireland. The site comprises the entire estuarine habitat from Limerick City westwards as far as Doonaha in Co. Clare and Dooneen Point in Co. Kerry. The site has vast expanses of intertidal flats which contain a diverse macroinvertebrate community, e.g. Macoma-Scrobicularia-Nereis, which provides a rich food resource for the wintering birds. Salt marsh vegetation frequently fringes the mudflats and this provides important high tide roost areas for the wintering birds. Elsewhere in the site the shoreline comprises stony or shingle beaches.’*

Taking a precautionary approach there is potential for the deterioration of this supporting habitat for species within the SPA resulting in potential for adverse effects on this SCI.

The targets and attributes for this SCI, as per the SSCOs of the SPA, are provided in Table 5-53.

*Table 5-52 Targets and attributes associated with nominated site-specific conservation objectives for wetlands and waterbirds.*

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target
Wetland habitat area	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 32,261ha, other than that occurring from natural patterns of variation	No (changes to wetland habitat area as a result of the Proposed Project will not occur)

## 6. ASSESSMENT OF POTENTIAL EFFECTS & ASSOCIATED MITIGATION

This section of the NIS assesses the potential effects of the Proposed Project on the identified relevant Qualifying Interests/Special Conservation Interests. This assessment is undertaken in the absence of any mitigation and in respect of the conservation objectives of the European Site/s. The Conservation Objectives each of the European Sites assessed were reviewed on the 19<sup>th</sup> November 2025. The Conservation Objectives for these sites are available at the following locations:

- › Lower River Suir SAC (002137)  
[https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO002165.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf)
- › Lower River Shannon SAC (002165)  
[https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO002165.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf)
- › Philipston Marsh SAC (001847)  
[https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO001847.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001847.pdf)
- › Slievefelim to Silvermines Mountains SPA (004165)  
[https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO004165.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004165.pdf)
- › River Shannon and River Fergus Estuaries SPA (004077)  
[https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO004077.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf)

Following the initial impact assessment, mitigation is prescribed where necessary to avoid adverse effects on the Conservation Objectives of the relevant QIs/SCIs.

### 6.1 Potential for Direct Effects on the European Sites

There will be no direct effects on any mapped Qualifying Interests (QIs) or Special Conservation Interests (SCIs) of any of the above European Sites, as a result of habitat loss/degradation or collision risk.

The Proposed Grid Connection Route component of the Proposed Project intercepts the Lower River Suir SAC and Lower River Shannon SAC collectively at six locations. Taking a precautionary approach, the potential for disturbance/displacement of the QIs/SCIs of these Sites as a result of the construction phase of the Proposed Project is considered below.

#### 6.1.1 Disturbance/Displacement

##### 6.1.1.1 Construction Phase

No resting or breeding sites for otter were recorded during the multidisciplinary surveys or dedicated aquatic surveys. However, mapped watercourses which form part of the Lower River Suir SAC and Lower River Shannon SAC, provide some suitable foraging and resting, and breeding habitat for otter. There is, therefore, potential for disturbance/displacement to otter during the construction phase of the Proposed Project, both within and outside the Lower River Suir SAC and Lower River Shannon SAC.

#### Mitigation

##### Mitigation by Avoidance

There are no instream works proposed as part of the Proposed Project. Where watercourse crossings are required, methods such as clear span and horizontal directional drilling (HDD) will be employed to remove the necessity of instream works, thereby avoiding potential disturbance effects on otter.

Additional mitigation

Otter is predominantly crepuscular in nature and are unlikely to be adversely impacted by the proposed works as a result of disturbance/displacement. Works will be mostly confined to daytime hours, thus minimizing potential disturbance related impacts to the species. The NPWS Threat Response Plan for Otter NPWS (2009) acknowledges that “Little evidence has come to light in recent studies to suggest that disturbance by recreation is a significant pressure.” It also identifies that Otter is known to travel significant distances from streams and lakes in search of new territory and feeding areas.

Channin (2003) provides a literary review with regard to anthropogenic disturbance and refers to several reports which have found that disturbance is not detrimental to Otters (Jefferies, 1987), (Durbin, 1993), (Green & Green, 1997). The report also describes successful breeding in towns, under ferry terminals and under the jetties of one of Europe’s largest oil and gas terminals at Sullom Voe in North Scotland.

Irish Wildlife Manual No 23 (National Otter Survey of Ireland 2004/2005) found no significant relationship between disturbance and otter occurrence. In addition, no significant difference in otter presence was found between sites with and without recreational activity. It also states, “the lowest percentage occurrence was found at the sites with the lowest recorded disturbance”. Irish Wildlife Manual No 76 (National Otter Survey of Ireland 2010/2012) notes that the occurrence of Otter was unaffected by perceived levels of disturbance at the survey sites. It also notes that there is little published evidence demonstrating any consistent relationship between Otter occurrence and human disturbance (Mason & Macdonald 1986, Delibes et al. 1991; Bailey & Rochford, 2006).

Regardless of the findings of the above noted literature, adopting a highly precautionary approach, in the absence of appropriate design and mitigation measures, the construction phase of the Proposed Project has the potential for some localised disturbance to otter resulting from noise and increased anthropogenic activities adjacent to watercourses within the Proposed Wind Farm site and along the Proposed Grid Connection Route. Mitigation measures to reduce any potential disturbance-related impact on QJ populations of otter associated with the Lower River Suir SAC and Lower River Shannon SAC are outlined below.

No active otter holts were recorded within 150m of any Proposed Project infrastructure within the Proposed Wind Farm site or along the Proposed Grid Connection Route. However, it is noted that this is a mobile species and could potentially migrate within the Site. As such, prior to the commencement of construction works associated with the installation of watercourse crossings, the following measures will be undertaken for the avoidance of disturbance/displacement and direct mortality and to ensure that no otter holts/breeding sites have been established since the original surveys undertaken (NRA, 2008):

- › A pre-commencement otter survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works.
- › Should the surveys identify the presence of an otter holt, the following measures will be undertaken.
  - A National Parks and Wildlife Service and a derogation licence will be applied for (although compliance with such a licence has not been relied on in this assessment).
  - No works will be undertaken within 150m of any holts at which breeding females or cubs are present.

- No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance will also not take place within 15m of such holts, except under licence (NRA, 2008).

In addition, the following mitigation measures will be implemented:

- › All plant and equipment for use will comply with Statutory Instrument No 359 of 1996 “European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1996”.
- › Operating machinery will be restricted to the proposed works site area.
- › Construction works will be limited to daylight hours and artificial lighting to facilitate works will not be permitted, where works occur in proximity to watercourses. Otters, being crepuscular in nature, will therefore not be disturbed by construction works.
- › The best means practical, including proper maintenance of plant machinery, will be employed to reduce the noise produced by on-site operations.
- › All vehicles and mechanical plant machinery will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.
- › Compressors will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- › Machines which are used intermittently will be shut down or throttled back to a minimum during those periods when they are not in use.
- › Any plant machinery such as generators or pumps which are required to work outside of normal working hours will be surrounded by an acoustic enclosure.

#### **Residual adverse effects:**

Following the successful implementation of the above listed mitigation measures, there will be no potential for residual adverse effects on QIs/SCIs of European Sites as a result of disturbance/displacement during construction.

#### **6.1.1.2 Operational Phase**

The operational phase of the Proposed Project will not result in any potential for adverse effects on any European Site, as a result of disturbance/displacement. No significant supporting habitat for otter was identified within the Proposed Wind Farm site, which will typically be unmanned with just occasional requirement for maintenance works. Regards the Proposed Grid Connection Route, once this has been constructed, it will be located entirely underground with minimal requirement for maintenance works.

No further assessment, with regards operational phase impacts as a result of disturbance/ displacement, is required.

#### **6.1.1.3 Decommissioning Phase**

The decommissioning phase of the Proposed Project will not result in any potential for adverse effects on any European Site, as a result of disturbance/displacement. Potential for direct adverse effects on European Sites as a result of disturbance/displacement is restricted to the Proposed Grid Connection Route, which will be permanent development as it will form part of the national grid. No further assessment, with regards decommissioning phase impacts as a result of disturbance/ displacement, is required.

## 6.2 Potential for Indirect Effects on European Sites

### 6.2.1 Deterioration of Surface Water Quality

Within the Proposed Wind Farm site, there is the requirement for the construction of 9 no. watercourse crossings along proposed access roads and an upgrade of 2 no. existing forestry tracks, with connectivity to the watercourses within the site. These watercourses ultimately discharge into the Lower River Suir SAC.

Additionally, the Proposed Grid Connection Route crosses 23 no. watercourse crossings referenced on EPA/OSI mapping and 12 no. drainage crossings identified during surveys which discharge either into the Lower River Suir SAC, Lower River Shannon SAC, Philipston Marsh SAC, and River Shannon and River Fergus Estuaries SPA.

Whilst no instream works are proposed as part of the Proposed Project, taking a precautionary approach, the proposed works have the potential to cause deterioration in surface water quality during the construction, operational and decommissioning phases of the Proposed Project due to the potential release of pollutants, including suspended solids and hydrocarbons, which, in the absence of mitigation could potentially affect downstream aquatic habitats and supporting faunal wetland habitat of the following QIs/SCIs:

#### Lower River Suir SAC [002137]

- › [3260] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
- › [6430] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
- › [1092] White-clawed Crayfish (*Austropotamobius pallipes*)
- › [1095] Sea Lamprey (*Petromyzon marinus*)
- › [1096] Brook Lamprey (*Lampetra planeri*)
- › [1099] River Lamprey (*Lampetra fluviatilis*)
- › [1103] Twaite Shad (*Alosa fallax fallax*)
- › [1106] Atlantic Salmon (*Salmo salar*)
- › [1355] Otter (*Lutra lutra*)

#### Lower River Shannon SAC [002165]

- › [1130] Estuaries
- › [1310] Salicornia and other annuals colonizing mud and sand
- › [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritima*)
- › [1410] Mediterranean salt meadows (*Juncetalia maritimi*)
- › [3260] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
- › [1095] Sea Lamprey (*Petromyzon marinus*)
- › [1096] Brook Lamprey (*Lampetra planeri*)
- › [1099] River Lamprey (*Lampetra fluviatilis*)
- › [1106] Atlantic Salmon (*Salmo salar*)
- › [1355] Otter (*Lutra lutra*)

#### Philipston Marsh SAC [001847]

- › [7140] Transition mires and quaking bogs

## River Shannon and River Fergus Estuaries SPA [004077]

- > [A017] Cormorant (*Phalacrocorax carbo*)
- > [A038] Whooper Swan (*Cygnus cygnus*)
- > [A046] Light-bellied Brent Goose (*Branta bernicla hrota*)
- > [A048] Shelduck (*Tadorna tadorna*)
- > [A050] Widgeon (*Anas Penelope*)
- > [A052] Teal (*Anas crecca*)
- > [A054] Pintail (*Anas acuta*)
- > [A056] Shoveler (*Anas clypeata*)
- > [A062] Scaup (*Aythya marila*)
- > [A137] Ringed Plover (*Charadrius hiaticula*)
- > [A140] Golden Plover (*Pluvialis apricaria*)
- > [A141] Grey Plover (*Pluvialis squatarola*)
- > [A142] Lapwing (*Vanellus vanellus*)
- > [A143] Knot (*Calidris canutus*)
- > [A149] Dunlin (*Calidris alpina*)
- > [A156] black-tailed Godwit (*Limosa limosa*)
- > [A157] Bar-tailed Godwit (*Limosa lapponica*)
- > [A160] Curlew (*Numenius arquata*)
- > [A162] Redshank (*Tringa tetanus*)
- > [A164] Greenshank (*Tringa nebularia*)
- > [A179] Black-headed Gull (*Chroicocephalus ridibundus*)
- > [A999] Wetlands

### Mitigation by Design

The project design has followed the basic principles outlined below to eliminate the potential for adverse effects on QI and SCI receptors:

- > Sensitive hydrological features have and will be avoided where possible, by application of suitable buffer zones (i.e. 50m to main watercourses, and 10m to main drains).
- > Hard standing areas have been designed to the minimum size necessary to accommodate the turbine model that is selected to reduce potential impacts on water quality.

### 6.2.1.2 Construction Phase

The construction phase of the Proposed Project will involve, clear-felling, excavations and earth moving and creation/upgrading of watercourse crossing, which create the potential for pollution in various forms, i.e. the generation of suspended solids and the potential for spillage of fuels associated with the refuelling of excavation machinery.

Surface and groundwater flowpaths as pathways for effect on the screened in European Sites, via deterioration of water quality.

Section 3.2 of **Appendix 6** prescribes detailed mitigation measures to be implemented to ensure that no impacts on any hydrological receptor occurs during the construction phase of the Proposed Project. Those pertinent to mitigating adverse effects on European Sites are highlighted below.

Furthermore, detailed drawings of the proposed drainage measures to be implemented during all phases of the Proposed Project are provided in **Appendix 7** of this report. These provide detail on the measures that have been incorporated into the Proposed Project to ensure that no runoff of sediment or hydrocarbons enter watercourses or downstream European Sites.

## Potential Effects from Clear Felling

### Proposed Mitigation Measures

Forestry operations will conform to current best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and DAFM guidance documents, including the specific guidelines listed below, to ensure that felling, planting and other forestry operations result in minimal potential negative effects to the receiving environment.

- > Forestry Standards Manual (Forest Service, 2015)
- > Environmental Requirements for Afforestation (Forest Service, 2016a)
- > Land Types for Afforestation (Forest Service, 2016b)
- > Forest Protection Guidelines (Forest Service, 2002)
- > Forest Operations and Water Protection Guidelines (Coillte, 2013)
- > Forestry and Water Quality Guidelines (Forest Service, 2000b)
- > Forestry and the Landscape Guidelines (Forest Service, 2000c)
- > Forestry and Archaeology Guidelines (Forest Service, 2000d)
- > Forest Biodiversity Guidelines (Forest Service, 2000e)
- > Forests and Water, Achieving Objectives under Ireland’s River Basin Management Plan 2018-2021 (DAFM, 2018)
- > Coillte Planting Guideline SOP
- > A Guide to Forest Tree Species Selection and Silviculture in Ireland (Horgan et al., 2003)
- > Management Guidelines for Ireland’s Native Woodlands. Jointly published by the National Parks & Wildlife Service (Cross and Collins, 2017)
- > Native Woodland Scheme Framework (Forest Service, 2018)
- > Code of Best Forest Practice (Forest Service, 2000)

#### Mitigation by Avoidance:

There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document “Forestry and Water Quality Guidelines” are shown in Table 6-1.

*Table 6-1 : Minimum Buffer Zone Widths (Forest Service, 2000)*

Average slope leading to the aquatic zone		Buffer zone width on either side of the aquatic zone	Buffer zone width for highly erodible soils
Moderate	(0 – 15%)	10m	15m
Steep	(15 – 30%)	15m	20m
Very steep	(>30%)	20m	25m

However, during the Proposed Wind Farm construction phase a self-imposed buffer zone of 50 metres will be maintained for all streams where possible.

With the exception of existing road upgrades and proposed new roads, all proposed tree felling areas at the Proposed Wind Farm site are generally located outside of imposed buffer zones (<1ha inside of buffers). Additional mitigation (detailed below) will be carried out where tree felling is required inside the buffer zones.

The large distance between most of the proposed felling areas (which are outside the 50m buffer zone) and sensitive aquatic zones means that potential poor-quality runoff from felling areas, will be adequately managed and attenuated prior to even reaching the aquatic buffer zone and primary drainage routes.

The following additional mitigation measures will be employed during tree felling. Additional measures are indicated for felling inside the 50m buffer zone.

Mitigation by Design:

Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows:

- › Machine combinations (i.e. handheld or mechanical) will be chosen, which are most suitable for ground conditions and which will minimise soils disturbance;
- › All machinery will be operated by suitably qualified personnel;
- › Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works;
- › Machines will traverse the site along specified off-road routes (referred to as racks);
- › The location of racks will be chosen to avoid wet and potentially sensitive areas;
- › Brash mats will be placed on the racks to support the vehicles on soft ground, reducing peat and mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal should take place when they become heavily used and worn. Provision should be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall;
- › Silt fences will be installed at the outfalls of existing drains downstream of felling areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any felling works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected peat disposal areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground;
- › In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed on site during construction;
- › Double silt fencing will also be put down slope of felling areas which are located in close proximity to streams and/or relevant watercourses;
- › Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded;
- › Timber will be stacked in dry areas, and outside watercourse buffer zones. Straw bales and check dams to be emplaced on the down gradient side of timber storage/processing sites;
- › Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff;
- › Refuelling or maintenance of machinery will not occur within 50m of an aquatic zone or within 20m of any other hydrological feature. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and,
- › Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors.

### **Silt Traps:**

Silt traps will be strategically placed down-gradient within forestry drains near streams. The main purpose of the silt traps and drain blocking is to slow water flow, increase residence time, and allow settling of silt in a controlled manner.

### **Pre-emptive Site Drainage Management :**

The works programme for the felling operations will also take account of weather forecasts and predicted rainfall in particular. Operations will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.

The following forecasting systems are available and will be used on a daily/weekly basis, as required, to allow site staff to direct proposed and planned construction activities:

- › General Forecasts: Available on a national, regional and county level from the Met Éireann website ([www.met.ie/forecasts](http://www.met.ie/forecasts)). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates;
- › MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale;
- › 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events;
- › Rainfall Radar Images: Images covering the entire country are freely available from the Met Éireann website ([www.met.ie/latest/rainfall\\_radar.asp](http://www.met.ie/latest/rainfall_radar.asp)). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and,
- › Consultancy Service: Met Éireann provide a 24-hour telephone consultancy service. The forecaster will provide an interpretation of weather data and give the best available forecast for the area of interest.

Using the safe threshold rainfall values will allow planned works to be safely executed (from a water quality perspective) in the event of forecasting of an impending high rainfall intensity event.

Works will be suspended if forecasting suggests any of the following is likely to occur:

- › >10 mm/hr (i.e. high intensity local rainfall events);
- › >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or,
- › >half monthly average rainfall in any 7 days.

### **Timing of Site Felling Works:**

Felling will only be carried out during periods of low 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.

### **Drain Inspection and Maintenance:**

The following items will be carried out during pre-felling inspections and after:

- › Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines;
- › Inspection of all areas reported as having unusual ground conditions;

- › Inspection of main drainage ditches and outfalls. During pre-felling inspections the main drainage ditches will be identified. Ideally the pre-felling inspection will be carried out during rainfall;
- › Following tree felling all main drains will be inspected to ensure that they are functioning;
- › Extraction tracks within 10m of drains will be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground;
- › Culverts on drains exiting the site, if impeded by silt or debris, will be unblocked; and,
- › All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall.

### **Surface Water Quality Monitoring:**

Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity. The ‘before’ sampling will be conducted within 4 weeks of the felling activity commencing, preferably in medium to high water flow conditions. The “during” sampling will be undertaken once a week or after rainfall events. The ‘after’ sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (i.e. where an impact has been shown).

Criteria for the selection of water sampling points include the following:

- › Avoid man-made ditches and drains, or watercourses that do not have year round flows, i.e. avoid ephemeral ditches, drains or watercourses;
- › Select sampling points upstream and downstream of the forestry activities;
- › It is advantageous if the upstream location is outside/above the forest in order to evaluate the impact of land-uses other than forestry;
- › Downstream locations will be selected: one immediately below the forestry activity, the second at exit from the forest, and the third some distance from the second (this allows demonstration of no impact through dilution effect or contamination by other land-uses where impact increases at third downstream location relative to second downstream location); and,
- › The above sampling strategy will be undertaken for all on-site sub-catchments streams where tree felling is proposed.

Also, daily surface water monitoring forms (for visual inspections and field chemistry measurements) will also be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection.

### **Potential Effects from Earthworks Resulting in Suspended Solids Entrainment in surface Waters**

#### Mitigation by Avoidance

The key mitigation measure during the construction phase is the avoidance of sensitive hydrological features where possible, by application of suitable buffer zones (i.e. 50m to main watercourses) at the Proposed Wind Farm site.

All key areas of the Proposed Wind Farm infrastructure are actually significantly away from the 50m delineated buffer zones with the exception of access road watercourse crossing locations (9 no. proposed new crossings and 2 no. existing crossings proposed for upgrade).

The large setback distance from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures (discussed below) to be properly installed and operate effectively. The proposed buffer zone will:

- › Avoid physical damage (river/stream banks and river/stream beds) to watercourses and associated release of sediment;
- › Avoid excavations within close proximity to surface watercourses;
- › Avoid the entry of suspended sediment from earthworks into watercourses; and,
- › Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.

Mitigation by Design:

- › Source controls:
  - Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sand bags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems.
  - Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas.
- › In-Line controls:
  - Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, straw bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems.
- › Treatment systems:
  - Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Silbuster, and/or other similar/equivalent or appropriate systems.

It should be noted for the Proposed Wind Farm site an extensive network of forestry and roadside drains already exists, and these will be integrated and enhanced as required and used within the wind farm development drainage system. The integration of the existing forestry drainage network and the Proposed Wind Farm network is relatively simple. The key elements being the upgrading and improvements to existing water treatment elements, such as in line controls and treatment systems, including silt traps, settlement ponds and buffered outfalls.

The main elements of interaction with existing drains will be as follows:

- › Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Proposed Wind Farm drainage into the existing site drainage network. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion;
- › Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area;
- › Runoff from individual turbine hardstanding areas will be not discharged into the existing drain network but discharged locally at each turbine location through settlement ponds and buffered outfalls onto vegetated surfaces;
- › Buffered outfalls which will be numerous over the Site will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the site; and,

- › Drains running parallel to the existing roads requiring widening will be upgraded, widening will be targeted to the opposite side of the road. Velocity and silt control measures such as check dams, sand bags, oyster bags, straw bales, flow limiters, weirs, baffles, silt fences will be used during the upgrade construction works. Regular buffered outfalls will also be added to these drains to protect downstream surface waters.

It should be noted that 2.3 km of the Proposed Wind Farm roads already exist (as forestry tracks) and are proposed for upgrade. The upgrading of these roads, albeit presents a potential short-term potential non-significant effect on surface water quality during construction, will be a positive effect in the long-term with regard to improved drainage controls.

### **Pre-commencement Temporary Drainage Works**

Prior to the commencement of road upgrades (or new road/hardstand or turbine base installs) the following key temporary drainage measures will be installed:

- › All existing dry forestry or agricultural drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using check dams/silt traps;
- › Clean water interceptor drains will be installed upgradient of the works areas;
- › Check dams/silt fence arrangements (silt traps) will be placed in all existing drains that have surface water flows and also along existing roadside drains; and,
- › A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.

### **Silt Fences:**

Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids such as those present in the glacial tills that overlie the site. This will act to prevent entry to water courses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff. Inspection and maintenance of these of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. Double silt fences will be placed within drains down-gradient of all construction areas inside the hydrological buffer zones.

### **Silt Bags:**

Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, the majority of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters or sedimats. Sediment entrapment mats, consisting of coir or jute matting, will be placed at the silt bag location to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure.

### **Settlement Ponds:**

The Proposed Wind Farm infrastructure footprint has been divided into drainage catchments (based on topography, outfall locations, and catchment size) and stormwater runoff rates based on the 10-year return period rainfall event.

### **Level Spreaders and Vegetation Filters:**

The purpose of level spreaders is to release treated drainage flow in a diffuse manner, and to prevent the concentration of flows at any one location thereby avoiding erosion. Level spreaders are not intended to be a primary treatment component for development surface water runoff. They are not stand alone but occur as part of a treatment train of systems that will reduce the velocity of runoff prior to be released at the level spreader. In the absence of levelspreaders, the potential for ground erosion is significantly greater than not using them.

Vegetation filters are essentially end-of-line polishing filters that are located at the end of the treatment train. In fact, vegetation filters are ultimately a positive consequence of not discharging directly into watercourses which is one of the mitigation components of the drainage philosophy. This makes use of the natural vegetation of the site to provide a polishing filter for the wind farm drainage prior to reaching the downstream watercourses.

Again, vegetation filters are not intended to be a single or primary treatment component for treatment of works area runoff. They are not stand alone but are intended as part of a treatment train of water quality improvement/control systems (i.e. source controls → check dams → silt traps → settlement ponds → level spreaders → silt fences → vegetation filters).

### **Water Treatment Train:**

A final line of defence will be provided by a water treatment train such as a “Siltbuster”. If the discharge water from construction areas fails to be of a high quality during regular inspections, then a filtration treatment system (such as a ‘Siltbuster’ or similar equivalent treatment train (sequence of water treatment processes) will be used to filter and treat all surface discharge water collected in the dirty water drainage system. This will apply for all of the construction phase.

### **Pre-emptive Site Drainage Management**

The works programme for the entire construction stage of the development will also take account of weather forecasts and predicted rainfall in particular. Large excavations and movements of soil/subsoil or vegetation stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.

The following forecasting systems are available and will be used on a daily basis at the site to direct proposed construction activities:

- › General Forecasts: Available on a national, regional and county level from the Met Eireann website ([www.met.ie/forecasts](http://www.met.ie/forecasts)). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates;
- › MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale;
- › 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events;
- › Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website ([www.met.ie/latest/rainfall\\_radar.asp](http://www.met.ie/latest/rainfall_radar.asp)). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and,
- › Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest.

Using the safe threshold rainfall values will allow work to be safely controlled (from a water quality perspective) in the event of forecasting of an impending high rainfall intensity event.

Works will be suspended if forecasting suggests either of the following is likely to occur:

- › >10 mm/hr (i.e. high intensity local rainfall events);
- › >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or,
- › >half monthly average rainfall in any 7 days.

Prior to works being suspended the following control measures will be completed:

- › All active excavations will be secured and sealed off;
- › Temporary or emergency drainage will be installed to prevent back-up of surface runoff; and,
- › No works will be completed during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded.

**Management of Runoff from The Spoil Repository Areas:**

It is proposed that excavated soil/subsoil (spoil) will be stored in 2 no. dedicated spoil repository areas and also within the 2 no. proposed borrow pit locations. Spoil will also be used for landscaping throughout the Proposed Wind Farm site, but only areas outside of 50m watercourse buffers will be considered. The 3 no. spoil repository areas and 2 no. borrow pits are located outside the 50m stream buffer zones.

Proposed surface water quality protection measures regarding the peat storage areas are as follows:

- › During the initial emplacement of spoil at the repository area, silt fences, straw bales and biodegradable matting will be used to control surface water runoff from the enclosure.
- › Drainage from the repository areas will be directed to settlement ponds as required or will overflow through controlled overflow pipes.
- › Discharge will be intermittent and will depend on preceding rainfall amounts.
- › Once the repository has been seeded and vegetation is established the risk to downstream surface water is significantly reduced.

Therefore, at each stage of the spoil repository development the above mitigation measures will be deployed to ensure protection of downstream water quality.

The repository area settlement ponds have been designed to allow a 24hr retention time as per EPA guidance (2006) which is the highest level of protection recommended by the EPA with regard to retention time.

**Timing of Site Construction Works:**

Construction of the site drainage system will only be carried out during periods of low 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. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works.

**Monitoring:**

An inspection and maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended. Inspections will also be undertaken after tree felling.

Any excess build-up of silt levels at dams, the settlement pond, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed. Checks will be carried out on a daily basis.

During the construction phase field testing, laboratory analysis of a range of parameters with relevant regulatory limits and EQSs will be undertaken for each primary watercourse and specifically following heavy rainfall events (as per the CEMP included in **Appendix 6**).

### **Allowance for Climate Change**

Climate Change rainfall projections are typically for a mid-century (2050) timeline. The projected effects of climate change on rainfall are therefore modelled towards the end of the life cycle of the Proposed Project, as the turbines have a life span of 35 years. It is likely that the long-term effects of climate change on rainfall patterns will not be observed during the lifetime of the Proposed Wind Farm. As outlined in the above sections we have designed settlement ponds for a 1 in 10 year return flow. This approach is conservative given that the project will likely be built over a much shorter period (12-18 months), and therefore this in-built redundancy in the drainage design more than accounts for any potential short term climate change rainfall effects.

However, the settlement ponds are designed for 1 in 10 years flows with built in redundancy (+20%) to account for climate change effects on rainfall.

### Potential Effects on Surface Water Quality from Excavation Dewatering

#### **Proposed Mitigation Measures:**

Management of excavation inflows and subsequent treatment prior to discharge into the drainage network will be undertaken as follows:

- Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations will be put in place;
- If required, pumping of excavation inflows will prevent build-up of water in the excavation;
- The interceptor drainage will be discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters;
- The pumped water volumes will be discharged via volume and sediment attenuation ponds adjacent to excavation areas, or via specialist treatment systems such as a silt bags or silt buster;
- There will be no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination will occur;
- Daily monitoring of excavations by a suitably qualified person will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken;
- At the turbine locations and borrow pits adequately sized settlement ponds will be constructed to treat pumped water prior to discharge into a local manmade drain; and,
- A mobile ‘Siltbuster’ or similar equivalent specialist treatment system can be made available at turbine locations for emergencies in order to treat sediment polluted waters from settlement ponds or excavations should they occur. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. The mobile units are specifically designed for use on construction-sites. They will be used as final line of defence if needed.

### Potential Effects from Hydrocarbons Leaks & Spills

#### **Proposed Mitigation Measures:**

Mitigation measures proposed to avoid release of hydrocarbons at the Site are as follows:

- On site re-fuelling of machinery will be carried out using a dedicated fuel truck. The fuel truck will also carry fuel absorbent material and pads in the event of any accidental spillages;
- Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations;
- On-site refuelling will be carried out by trained personnel only;
- A permit to fuel system will be put in place;
- Fuels stored on site will be minimised. Fuel storage areas, if required, will be bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor;
- The plant used during construction will be regularly inspected for leaks and fitness for purpose; and,
- An emergency plan for the construction phase to deal with accidental spillages will be included within the Construction and Environmental Management Plan (**Appendix 6**). Spill kits will be available to deal with any accidental spillage in and outside the re-fuelling area.

### Release of Cement-Based Products

#### Proposed Mitigation Measures:

- No batching of wet-concrete products will occur on site. Ready-mixed supply of wet concrete products and, where possible, emplacement of pre-cast elements, will take place;
- Where possible, pre-cast elements for culverts and concrete works will be used;
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined concrete washout ponds;
- Weather forecasting will be used to plan dry days for pouring concrete; and,
- The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.

### Potential Effects due to Watercourse Crossing Works

#### Proposed Mitigation Measures:

- All proposed 9 no. new stream crossings and 2 no. upgrades will be bottomless or clear span structures and the existing banks will remain undisturbed. No in-stream excavation works are proposed and therefore there will be no direct impact on the stream at the proposed crossing location;
- Where the proposed cable route follows an existing road or road proposed for upgrade, the cable will pass over or below the culvert within the access road;
- All guidance / mitigation measures proposed by the OPW or the Inland Fisheries Ireland<sup>10</sup> are incorporated into the design of the proposed crossings;
- As a further precaution, near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document “Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites”, i.e., May 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);

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<sup>10</sup> Inland Fisheries Ireland (2016): *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*

- During the near stream construction work, double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas;
- All new river/stream crossings will require a Section 50 application (Arterial Drainage Act, 1945). The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent; and,
- All crossings will be designed to accommodate a 100-year design flood with allowance for 300mm freeboard

The watercourse crossings will be constructed to the specifications of the OPW bridge design guidelines 'Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945', and in consultation with Inland Fisheries Ireland. Abutments will be constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material.

Confirmatory inspections of the proposed new watercourse crossing location will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.

In relation to the new proposed culverts and proposed culvert upgrades at forestry drain crossings, the culverts will be suitably sized (minimum 900mm) for the expected peak flows in the relevant drain. All culverts will be installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts will have a smooth internal surface. Larger culverts may have corrugated surfaces which will trap silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of the culvert, large stone may be used to interrupt the flow of water. This will help dissipate its energy and help prevent problems of erosion. Smaller water crossings will simply consist of an appropriately sized pipe buried in the sub-base of the road at the necessary invert level to ensure ponding or pooling does not occur above or below the culvert and water can continue to flow as necessary.

### Potential Surface Water Quality Effects of the Proposed Grid Connection Earthworks Works and Watercourse Crossings

#### **Proposed Mitigation Measures:**

##### Pre-commencement Temporary Drainage Works:

Prior to the commencement of substation, BESS or cable trenching works the following key temporary drainage measures will be installed:

- All existing roadside drains (where present) that intercept the proposed works area will be temporarily blocked down-gradient of the works using check dams/silt traps;
- Culverts, manholes and other drainage inlets (where present) will also be temporarily blocked;
- A double silt fence perimeter will be placed along the road verge on the down-slope side of works areas that are located inside the watercourse 50m buffer zone on the Levally Stream tributary.

The following mitigation measures are proposed for the underground cabling watercourse crossing works:

- No stock-piling of construction materials will take place along the grid route;
- No refuelling of machinery or overnight parking of machinery is permitted in this area;
- No concrete truck chute cleaning is permitted in this area;
- Works will not take place at periods of high rainfall, and will be scaled back or suspended if heavy rain is forecast;
- Local road drainage, culverts and manholes will be temporarily blocked during the works;

- › Machinery deliveries will be arranged using existing structures along the public road;
- › All machinery operations will take place away from the stream and ditch banks, apart from where crossings occur.
- › Any excess construction material will be immediately removed from the area and sent to a licenced waste facility;
- › No stockpiling of materials will be permitted in the constraint zones;
- › Spill kits will be available in each item of plant required to complete the stream crossing; and,
- › Silt fencing will be erected on ground sloping towards watercourses at the stream crossings if required.

**Fracture Blow-out (Frac-out) Prevention and Contingency Plan for HDD:**

- › The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e. Clear Bore Drilling Fluid or similar will be used);
- › The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage;
- › One or more lines of silt fencing will be placed between the works area and the adjacent river;
- › Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility;
- › Adequately sized skips will be used where temporary storage of arisings are required;
- › The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;
- › This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;
- › Any frac-out material will be contained and removed off-site;
- › The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and,
- › If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.

**Use of Siltbuster and Effect on Downstream Surface Water Quality**

**Proposed Mitigation Measures:**

Measures employed to prevent overdosing and potential chemical carryover:

- › The siltbuster system comprises an electronic in-line dosing system which provides an accurate means of adding agents so overdosing does not occur;
- › Continued monitoring and water analysis of pre and post treated water by means of an inhouse lab and dedicated staff, means the correct amount of chemical is added by the dosing system;
- › Dosing rates of chemical to initiate settlement is small, being in the order of 2-10 mg/L and the vast majority of the chemical is removed in the deposited sediment;
- › Final effluent not meeting the discharge criteria is recycled and retreated, which has a secondary positive effect of reducing carryover; and,
- › Use of biodegradable chemical agents can be used at very sensitive sites.

**6.2.1.2.2 Residual adverse effects from Construction**

Following the successful implementation of the above listed mitigation measures, there will be no potential for significant residual adverse effects on water quality/habitat degradation of European Sites as a result deterioration of water quality during the construction of the Proposed Project.

### 6.2.1.3 Operational Phase

The following pathways for which deterioration of water quality may occur during the operational phase of the Proposed Project have been identified:

- › Progressive Replacement of Natural Surface with Lower Permeability Surface
- › Potential Effects from Surface Water Runoff

As discussed above, a potential pathway for adverse effects on European Sites, taking a precautionary approach, was identified due to downstream hydrological connectivity from the Site. Each of the above pathways are assessed below, with mitigation prescribed to ensure no significant impacts on water quality during operation. Full details on mitigations are detailed in the drainage drawings in **Appendix 7** and are summarised below.

#### Progressive Replacement of Natural Surface with Lower Permeability Surface

##### **Proposed Mitigation by Design:**

The operational phase drainage system of the Proposed Development will be installed and constructed in conjunction with the road and hardstanding construction work as described below and as shown on the Drainage drawings submitted with this planning application (**Appendix 7**):

- › Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader;
- › Swales/road side drains will be used to collect runoff from access roads and turbine hardstanding areas of the site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling;
- › On steep sections of access road transverse drains ('grips') will be constructed in the surface layer of the road to divert any runoff off the road into swales/road side drains;
- › Check dams will be used along sections of access road drains to intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock;
- › Settlement ponds, emplaced downstream of road swale sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses; and,
- › Settlement ponds have been designed in consideration of the greenfield runoff rate.

#### Potential Effects from Surface Water Runoff

##### **Proposed Mitigation Measures:**

The mitigation measures outlined in Section 6.2.2.2 will ensure all surface water runoff from upgraded roads and new road surfaces (including hardstand, turbine base areas and substation) will be captured and treated prior to discharge/release. Settlement ponds, checks dams and buffered outfalls will prevent roads acting as preferential flowpaths by providing attenuation and water quality treatment.

It is proposed that bedrock from on-site borrow pits will be used to construct the sub-base layer of proposed upgraded and new access roads, hardstand areas and turbine base areas. Once installed the subbase layer will be overlain by a clean capping layer of high-grade stone material which will be sourced from local quarries also.

### 6.2.1.3.2 **Residual adverse effects from Operation**

Following the successful implementation of the above listed mitigation measures, there will be no potential for significant residual adverse effects on water quality/habitat degradation of European Sites as a result of deterioration of water quality during the operation of the Proposed Project.

### 6.2.1.4 **Decommissioning Phase**

The potential impacts associated with decommissioning of the Proposed Project will be similar to those associated with construction but of a reduced magnitude, due to the reduced scale of the proposed decommissioning works in comparison to construction phase works.

The proposed decommissioning works include the following:

#### Proposed Wind Farm

As construction will be completed, elements of the project that will be developed as a temporary facilitator will either be removed, restored to its original condition, or will naturally revegetate. This includes the temporary construction compound. All access roads and hardstanding areas forming part of a site roadway network will be required by the ongoing farming operations and therefore will be left in situ for future use.

It is intended that decommissioning phase will remove all the remaining elements i.e., above ground components and underground cabling from the Proposed Wind Farm, and reinstate areas where infrastructure is removed. The following elements will be decommissioned:

- › Wind turbines and Met Mast: dismantling and removal off site.
- › Turbine and Met Mast foundation: Turbine and met mast foundation backfilling following dismantling and removal of wind turbines (foundations that protrude above ground level will be backfilled with soil - underground reinforced concrete remaining in-situ);
- › Internal Underground cabling: removal (ducting remaining).

#### Wind Turbines and Met Mast

Prior to any works being undertaken on wind turbines or the met mast, they will be disconnected from the grid by the site operator in conjunction with ESB Networks. The dismantling and removal of wind turbines and met mast of this scale is a specialist operation which will be undertaken by the turbine supplier or competent subcontractor. Turbine dismantling will be undertaken in reverse order to methodology employed during their construction. Cranes will be brought back to the Proposed Wind Farm site utilising the hardstand areas adjacent to each turbine. The dismantling of turbines and met mast will be bound by the same safety considerations as will be the case during construction in terms of weather conditions. Works will not be undertaken during adverse weather conditions in particular high winds.

The turbines and met mast will be removed from the Proposed Wind Farm site in a similar manner to how they will be transported to the site originally in extended articulated trucks. The details of transport to and from the Proposed Wind Farm site are assessed in Chapter 15.1 of the accompanying EIAR, which accompanies this application.

The transport of disassembled turbines from the Proposed Wind Farm site will be undertaken in accordance with a Transport Management Plan (TMP). The TMP will be issued to and agreed with the planning authority at that time as part of a permit application for the delivery of abnormal loads using the local roads under the Road Traffic (Special Permits for Particular Vehicles) Regulations 2007. The

TMP will provide for all necessary safety measures, including a convoy and Garda escort as required, off-peak turning/reversing movements and any necessary safety controls.

### Turbine and Met Mast Foundations

On the dismantling of turbines and met mast, it is not intended to remove the concrete foundation from the ground. It is considered that its removal will be the least preferred option in terms of potential effects on the environment. Therefore, the foundations of the 14 no. turbine and met mast will be covered with soil material. If there is usable soil or overburden material on the Proposed Wind Farm site after construction, this material will be used. Alternatively, where material is not readily available on site, soil will be sourced locally and imported to site on heavy good vehicles (HGVs). The imported soil will be spread and graded over the foundation using a tracked excavator and revegetation enhanced by spreading of an appropriate seed mix to assist in revegetation and accelerate the resumption of the natural drainage management that will have existed prior to any construction.

### Internal Underground Cabling

The underground cabling within the Site, connecting the turbines to the onsite substation, will be pulled from the cable duct using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at each of the pull pits along the cable. The ground above original pulling pits 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 for an underground element that is not visible with no environmental impact associated with leaving the ducting in-situ.

### Proposed Grid Connection Route

As construction will be completed, the Proposed Grid Connection Route temporary construction compound that was developed as a temporary facilitator will either be removed and restored to its original condition or will naturally revegetate. The Proposed Grid Connection Route and onsite 110kV substation will remain in place as it will be under the ownership and control of ESBN.

### Mitigations

The mitigations detailed in the construction phase in Section 6.2.1.2 above will be applied during decommissioning. This will ensure that no adverse effects on any European Site will occur, as a result of disturbance/displacement or deterioration of water quality.

#### 6.2.1.4.1 **Residual adverse effects from Decommissioning:**

Following the successful implementation of the above listed mitigation measures, there will be no potential for residual adverse effects on water quality/habitat degradation of European Sites as a result of deterioration of water quality during decommissioning of the Proposed Project.

#### 6.2.2 **Invasive Species**

During field surveys, a search for Invasive Alien Species (IAS) listed under the ‘Third Schedule’ of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) and the ‘First Schedule’ of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 374 of 2024) was conducted. Japanese knotweed (*Reynoutria japonica*) and Giant knotweed (*Reynoutria sachalinensis*) were recorded in the vicinity of site infrastructure.

Stands of Giant Hogweed and Rhododendron were recorded along the Proposed Grid Connection Route, adjacent to road and bridge infrastructure.

Full details of all scheduled invasive species recorded during the surveys, with locations and extent of infestation, are provided in the Invasive Species Management Plan (ISMP) in **Appendix 4**.

### 6.2.2.1 Construction Phase

The ISMP in **Appendix 4** provides robust mitigation and best practice measures to ensure that infestations of invasive species do not spread into both the local environment and European Sites, as a result of the Proposed Project.

#### 6.2.2.1.1 Residual adverse effects from Construction

Following the successful implementation of the mitigation measures detailed in **Appendix 4** are implemented, there will be no potential for residual adverse effects on European Sites as a result of invasive species during decommissioning of the Proposed Project.

### 6.2.2.2 Operational Phase

No potential for adverse effects on any European Site is anticipated, as a result of invasive species spreading as a result of the Proposed Project, during operation.

7.

## ASSESSMENT OF RESIDUAL ADVERSE EFFECTS

The potential for residual adverse effects on each of the individual relevant Qualifying Features of the Screened In European Sites, following the implementation of mitigation, is assessed in this section of the report.

Based on the above, in view of best scientific knowledge, on the basis of objective information, there is no potential for adverse effect on the identified QIs/SCIs and their associated targets and attributes, or on any European Site. Potential pathways for effect have been robustly blocked through measures to avoid impacts and the incorporation of best practice/mitigation measures into the project design.

Taking cognisance of measures to avoid impacts and best practice/mitigation measures incorporated into the project design which are considered in the preceding section, the Proposed Project will not have an adverse effect on the integrity of any European Site.

The Proposed Project will not prevent the QIs/SCIs of European Sites from achieving/maintaining favourable conservation status in the future as defined in Article 1 of the EU Habitats Directive. A definition of Favourable Conservation Status is provided below:

*'Favourable conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2; The conservation status will be taken as 'favourable' when:*

- › *Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and*
- › *The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and*
- › *There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.'*

*'Favourable conservation status of a habitat is achieved when:*

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

Based on the above, it can be concluded in view of best scientific knowledge, on the basis of objective information that the Proposed Project will not adversely affect the Qualifying Interests/Special Conservation Interests associated with any European Site.

## 8. ASSESSMENT OF CUMULATIVE EFFECTS

A search and review in relation to plans and projects that may have the potential to result in in-combination impacts on European Sites was conducted. This assessment focuses on the potential for in-combination effects on the European Sites where potential for adverse effects was identified in Section 5 of this report. This included a review of online Planning Registers, development plans and other available information and served to identify past and future plans and projects, their activities and their predicted environmental effects. A list of the projects considered is provided in **Appendix 5**.

### 8.1 Plans

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

- › Tipperary County Development Plan 2022-2028
- › Limerick Development Plan 2022-2028
- › Ireland’s 4th National Biodiversity Action Plan 2023-2030
- › Regional Spatial & Economic Strategy for the Southern Region, Project Ireland 2040

The review focused on policies and objectives that relate to European sites. Policies and objectives relating to the conservation of Annex I habitats were also reviewed. No potential for in-combination effects with the Proposed Project has been identified, and the Proposed Project is in compliance with the relevant objectives of the Plans.

In addition, the Appropriate Assessments carried out for these Plans have been reviewed, where available. Relevant available reports for these plans, where available, can be found at the following locations:

- › Tipperary County Development Plan 2022-2028  
  
<https://www.tipperarycoco.ie/sites/default/files/2022-08/Appropriate%20Assessment%20Natura%20Impact%20Report.pdf>
- › Limerick Development Plan 2022-2028  
  
<https://www.limerick.ie/sites/default/files/media/documents/2022-03/natura-impact-report-material-alterations.pdf>

The Appropriate Assessments carried out for the respective Development Plans has concluded that there is no potential for Residual Adverse Effect as a result of implementation of the Plans. Therefore, there is no potential for cumulative effect as a result of the Proposed Project in-combination with the Plan.

### 8.2 Assessment of Projects

Assessment material for this in-combination impact assessment was compiled on the relevant developments within the vicinity of the Proposed Project and was verified in November 2025. The material was gathered through a search of relevant online Planning Registers, reviews of relevant documents, planning application details and planning drawings, and served to identify past and future projects, their activities and their environmental impacts. All relevant projects were considered in relation to the potential for in-combination effects. All relevant data was reviewed (e.g. individual EISs/EIARs, layouts, drawings etc.) for all relevant projects, where available.

The plans and projects considered include those listed in **Appendix 5**. The residual construction, operational and decommissioning impacts of the Proposed Project are considered cumulatively with other plans and projects. Particular focus has been placed on those plans and projects that are in closest proximity to the Proposed Project and those that could potentially result in impacts on SCI bird species, surface water, groundwater and QI habitats and species.

8.2.1

## Other Projects within the Hydrological Sub-catchment

As the Proposed Project is hydrologically connected to several European Sites, which have been considered in this NIS, the potential for cumulative impacts on hydrology has been considered.

### Cumulative Effects with Agriculture

Agricultural practices such as the movement of soil and the addition of fertilizers and pesticides can lead to nutrient losses and the entrainment of suspended solids in local surface watercourses. This can have a negative effect on local and downstream surface water quality.

In an unmitigated scenario the Proposed Project would have the potential to interact with these agricultural activities and contribute to a deterioration of downstream surface water quality through the emissions of elevated concentrations of suspended solids and ammonia.

However, the mitigation measures detailed in Section 9.5 of Chapter 9 of the accompanying EIAR for the construction, operation and decommissioning phases of the Proposed Project will ensure the protection of downstream surface water quality.

For these reasons, there will not be a significant cumulative effect associated with agricultural activities.

### Cumulative Effects with Commercial Forestry

The most common water quality problems arising from forestry relate to the release of sediment and nutrients to the aquatic environment and impacts from acidification. Forestry works can also give rise to modified stream flow regimes caused by associated land drainage.

However, the mitigation measures detailed for the construction, operation and decommissioning phases of the Proposed Project will ensure the protection of downstream surface water quality.

For these reasons there will not be a significant cumulative effect associated with commercial forestry activities.

### Cumulative Effects with One Off Housing Developments

A detailed cumulative assessment has been carried out for all planning applications (granted and awaiting decisions) within the cumulative assessment area described above.

There are applications for new dwellings or renovations of existing dwellings, as well as for the erection of farm buildings. Based on the scale of the works, their proximity to the Site and the temporal period of likely works, no cumulative effects will occur as a result of the Proposed Project (construction, operation and decommissioning phases).

## Cumulative Effects with Other Wind Farm Developments

With the exception of the permitted Upperchurch Wind Farm, all wind farm developments are existing and operational. Therefore, there is no risk of a construction overlap with the operational wind farms and the Proposed Project.

Also, the likelihood of a construction phase overlap with the Upperchurch Wind Farm (if constructed) is unlikely given the different stages of the planning process the wind farms are at. Nonetheless, only 2 no. of the permitted 22 no. Upperchurch Wind Farm turbines are located in the Multeen River catchment. Therefore, even in the worst-case scenario of a construction phase overlap, significantly cumulative effects are not likely.

As stated above, the operation of the proposed Carrow Wind Farm (if permitted and constructed) is not expected to result in any significant cumulative effects with the already operational developments in the Multeen River catchment.

Therefore, it can be concluded with high confidence (based on the information available to date) that the Proposed Project is not likely to contribute to cumulative effects with regard other wind farm developments in the cumulative Water Study Area.

*Table 8-1: List of Other Wind Farm Developments Assessed for Hydrological Cumulative Effects*

Catchment	Wind Energy Development (Status)	Total Turbine No.	Turbine No. in Multeen Catchment
Multeen River	Cappawhite A WF ( <b>Existing</b> )	8	1
	Cappawhite B WF ( <b>Existing</b> )	9	5
	Glencarbry I WF ( <b>Existing</b> )	9	9
	Glencarbry II WF ( <b>Existing</b> )	2	2
	Glenlough WF ( <b>Existing</b> )	14	14
	Turaheen Lower WF ( <b>Existing</b> )	3	3
	Holyford WF ( <b>Existing</b> )	3	3
	Falleennafinoga WF ( <b>Existing</b> )	2	2
	Garracummer (Tooreen) WF ( <b>Existing</b> )	2	2
	Milestone WF ( <b>Existing</b> )	3	3
	Upperchurch WF ( <b>Granted</b> )	22	2
	Inchivara Turbine ( <b>Existing</b> )	1	1
<b>Totals</b>		<b>78</b>	<b>47</b>

### 8.2.2 Proposed Grid Connection Route

A desk-based planning search was undertaken on the 2<sup>nd</sup> of March 2026 to identify permitted developments within 150m vicinity of the Proposed Grid Connection Route within the past 5 years. The

projects within this boundary are provided in **Appendix 5**. Projects identified within this area consisted predominantly of the construction of individual private dwellings, extensions to existing dwellings, as well as agriculture and energy and telecoms.

As per the assessment of residual adverse effects in Section 7 of this report, the Proposed Project will not adversely affect the Qualifying Interests/Special Conservation Interests associated with any European Site. Therefore, there is no potential for cumulative effect as a result of the Proposed Project in-combination with these projects.

### 8.2.3 Other Wind Farm Projects

For the purposes of this cumulative assessment, wind farms within a 25-kilometre radius of the Proposed Project area were considered in further detail below. Details of wind farm projects within 25km of the Proposed Project are provided in **Appendix 5** and are summarised below. In total, 23 no. wind farms were identified within the cumulative study boundary.

*Table 8-2 Wind farm projects considered to be within the cumulative study area of the Proposed Project.*

Wind Farm	Planning Status	Number of Turbines	Separation Distance (turbine to turbine)	County
Glencarbry 1 Wind Farm	Existing	7	c. 0.6 km	Co. Tipperary
Glenough Wind Farm	Existing	14	c. 2.4 km	Co. Tipperary
Glencarbry 2 Wind Farm	Existing	2	c. 2.7 km	Co. Tipperary
Cappawhite B Extension	Existing	9	c. 2.9 km	Co. Tipperary
Turaheen Lower Wind Farm	Existing	3	c. 3.2 km	Co. Tipperary
Holyford Wind Farm	Existing	3	c. 3.5 km	Co. Tipperary
Cappawhite A	Existing	8	c. 4 km	Co. Tipperary
Falleennafinoga Wind Farm	Existing	2	c. 4.3 km	Co. Tipperary
Garracummer Wind Farm	Existing	15	c. 4.4 km	Co. Tipperary
Mienvee Turbine	Existing	1	c. 4.7 km	Co. Tipperary
Turaheen Upper Turbine	Existing	1	c. 5.1 km	Co. Tipperary
Inchivara Turbine	Existing	1	c. 7.2 km	Co. Tipperary
Upperchurch Wind Farm	Existing	22	c. 7.5 km	Co. Tipperary
Milestone Wind Farm	Existing	3	c. 8 km	Co. Tipperary
Knocknastanna Wind Farm	Existing	4	c. 8.4 km	Co. Limerick
Gortnahalla Wind Farm	Existing	1	c. 12.5 km	Co. Tipperary
Templederry	Existing	2	c. 18.4 km	Co. Tipperary
Kill Hill Wind Farm	Existing	16	c. 18.9 km	Co. Tipperary
Curraghraigue 1 Wind Farm	Existing	3	c. 19.9 km	Co. Tipperary
Curraghraigue 2 Wind Farm	Existing	3	c. 20 km	Co. Tipperary
Brittas	Proposed	10	c. 20 km	Co. Tipperary
Ballinveny Wind Farm	Existing	3	c. 24.2 km	Co. Tipperary
Ballinlough Wind Farm	Existing	3	c. 24.4 km	Co. Tipperary
Littleton Wind Farm	Pre-Planning	11	c. 24.5 km	Co. Tipperary

#### Glencarbry 1 Wind Farm

This wind farm consists of 7 no. turbines and is located approximately 0.6 km north of the Proposed Wind Farm site.

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside Glencarbry 1 Wind Farm.

A review of all designated sites with 5km of Glencarbry Wind Farm was carried out to allow for an assessment of any potential direct or indirect on these sites which may result from Glencarbry Wind Farm. It was concluded that Glencarbry Wind Farm would not have a direct impact on any designated

site. The site was within 5km of four candidate SACs, namely the Lower River Shannon cSAC, Lower River Suir cSAC, Inchinquilib and Downings Woods cSAC, Anglesey Road SAC, in addition to Slievefelim to Silvermines SPA. No other designated sites were within 5km of the Glencarbry Wind Farm site. The Environmental Impact Statement for Glencarbry Wind Farm concluded that no significant residual effects on designated sites, protected habitats or flora, in addition to fauna were anticipated as a result of the construction or operation of the wind farm.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Glenough Wind Farm

This wind farm consists of 14. no turbines and is located approximately 2.4 km north of the Proposed Wind Farm site.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely conifer plantations, mapped heath habitat, and agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Glencarbry 2 Wind Farm

This wind farm consists of 2 no. turbines and is located approximately 2.7 km north of the Proposed Wind Farm site.

A review of all designated sites with 5km of Glencarbry 2 Wind Farm was carried out to allow for an assessment of any potential direct or indirect on these sites which may result from Glencarbry Wind Farm. It was concluded that Glencarbry Wind Farm will not have a direct impact on any designated site. The site was within 5km of four candidate SACs, namely the Lower River Shannon cSAC, Lower River Suir cSAC, Inchinquilib and Downings Woods cSAC, Anglesey Road SAC, in addition to Slievefelim to Silvermines SPA. No other designated sites were within 5km of the Glencarbry Wind Farm site. The updated Environmental Impact Statement for Glencarbry 2 Wind Farm concluded that no significant residual effects on designated sites, protected habitats or flora, in addition to fauna were anticipated as a result of the construction or operation of the wind farm.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Cappawhite B Extension

This wind farm extension consists of 9 no. turbines and is located approximately 2.9 km west of the Proposed Wind Farm site.

Following AA Screening, two Natura 2000 Sites, Lower River Suir SAC and Lower River Shannon SAC, were found to be at risk of significant adverse impacts due to the proposed Cappawhite B Extension. The main potential impacts identified were a deterioration in water quality due to related construction activities, in addition to potential changes hydrographic peaks of downstream watercourses due to the development.

Following Stage 2 Appropriate Assessment, it was concluded that following mitigation, the Lower River Suir SAC and Lower River Shannon SAC would not be significantly impacted upon as a result of the construction, operation, and decommissioning of the proposed wind farm extension.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Turaheen Lower Wind Farm

This wind farm consists of 3 no. turbines and is located approximately 3.2 km northeast of the Proposed Wind Farm site.

The Natura Impact Assessment for Turaheen Lower Wind Farm concluded that once the recommended mitigation measures outlined in the NIS are in place, the predicted impacts of the proposed Turaheen Lower Wind Farm on European Sites are unlikely to be significant.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Holyford Wind Farm

This wind farm consists of 3 no. turbines and is located approximately 3.5 km northwest of the Proposed Wind Farm site.

The site is not part of, or adjacent to, a designated area of conservation importance. One such site, Anglesey Road cSAC, is located to the north. The associated Environmental Impact Statement stated that Holyford Wind Farm would not have had any impacts on the nearby Anglesey Road cSAC.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Cappawhite A Wind Farm

This wind farm consists of 8 no. turbines and is located approximately 4 km west of the Proposed Wind Farm site.

The Cappawhite Wind Farm Environmental Statement concluded that the site did not form part of or is included in a SAC or SPA. The nearest designated sites included Anglesey Road cSAC, Lower River Suir cSAC, and Slievefelim SPA. However, none of the likely identified impacts were considered significant where the mitigation measures outlined in the report are implemented and adhered to.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Falleennafinoga Wind Farm

This wind farm consists of 2 no. turbines and is located approximately 4.3 km north of the Proposed Wind Farm site.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely

conifer plantations, mapped heath habitat, and agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Garracummer Wind Farm

This wind farm consists of 15. no turbines and is located approximately 4.4 km northwest of the Proposed Wind Farm site.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely conifer plantations, mapped heath habitat, and agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Mienvee Turbine

This wind farm consists of 1. no turbines and is located approximately 4.7 km northwest of the Proposed Wind Farm site.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely conifer plantations, mapped heath habitat, and agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Turraheen Upper

This wind farm consists of 1. no turbines and is located approximately 5.1 km northeast of the Proposed Wind Farm site.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely conifer plantations, and agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Inchivara Turbine

This wind farm consists of 1. no turbines and is located approximately 7.2 km north of the Proposed Wind Farm site.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Upperchurch Wind Farm

This wind farm consists of 22. no turbines and is located approximately 7.5 km north of the Proposed Wind Farm site.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely conifer plantations, mapped heath habitat, and agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Milestone Wind Farm

This wind farm consists of 3. no turbines and is located approximately 8 km north of the Proposed Wind Farm site.

The site of Milestone Wind Farm is not located within any Natura 2000 Site, although a total of five were located within 10km. Slievefelim to Silvermines Mountains SPA and the Lower River Suir SAC were further considered due to the potential impacts on hen harrier and hydrological connectivity respectively. The Milestone Wind Farm Appropriate Assessment Screening Report concluded that there would be no significant impacts on the Slievefelim to Silvermines Mountains SPA, the Lower River Suir SAC, or any other Natura 2000 Site, as a result of the wind farm at Milestone, Co. Tipperary.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Knocknastanna Wind Farm

This wind farm consists of 4. no turbines and is located approximately 8.4 km west of the Proposed Wind Farm site.

A search was made on the Limerick County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely

conifer plantations, mapped heath habitat, and agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Gortnahalla Wind Farm

This wind farm consists of 1. no turbines and is located approximately 12.5 km northeast of the Proposed Wind Farm site.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Templederry Wind Farm

This wind farm consists of 2. no turbines and is located approximately 18.4 km northwest of the Proposed Wind Farm site.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Kill Hill Wind Farm

This wind farm consists of 16. no turbines and is located approximately 18.9 km southeast of the Proposed Wind Farm site.

The Kill Hill Wind Farm Environmental Impact Statement stated that no European Designated Sites or other sites of significant ecological value will be impacted by the construction Kill Hill Wind Farm.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Curraghraigue 1 Wind Farm

This wind farm consists of 3. no turbines and is located approximately 19.9 km northwest of the Proposed Wind Farm site.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this

wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### **Curraghraigue 2 Wind Farm**

This wind farm consists of 3. no turbines and is located approximately 20 km northwest of the Proposed Wind Farm site.

The Curraghraigue Wind Farm Environmental Impact Statement states that the site is not located in an area of conservation and largely contains grassland habitat, and no adverse predicted impacts are foreseen to the proposal for the wind farm development.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### **Brittas Wind Farm**

This wind farm consists of 10. no turbines and is located approximately 20 km northeast of the Proposed Wind Farm site.

Based on the information set out in the Natura Impact Statement for Brittas Wind Farm, there is no ecological, hydrological or hydrogeological connectivity between the Site and other Natura 2000 site, apart from the Lower River Suir SAC. That said, the mitigation measures outlined in the NIS are considered to be sufficient to prevent any effect on Qualifying Interests or the integrity of the Natura 2000 sites identified as potentially affected by the project.

The NIS concluded that with reasonable scientific certainty, that the proposed project, individually or in combination with other plans or projects, will have no adverse effect on the integrity of any European (Natura 2000) sites.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### **Ballinveny Wind Farm**

This wind farm consists of 3. no turbines and is located approximately 24.2 km northwest of the Proposed Wind Farm site.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely conifer plantation and agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Ballinlough Wind Farm

This wind farm consists of 3. no turbines and is located approximately 24.4 km northwest of the Proposed Wind Farm site.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

### Littleton Wind Farm

This proposed wind farm consists of 11. no turbines and is located approximately 24.5 km east of the Proposed Wind Farm site.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on European Sites was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely peatland) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

Therefore, no potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project.

## **Conclusion of Assessment of Cumulative Effects**

Following the detailed assessment provided in the preceding sections, it is concluded that, the Proposed Project will not result in any residual adverse effects on any of the European Sites, their integrity or their conservation objectives when considered on its own. There is therefore no potential for the Proposed Project to contribute to any cumulative adverse effects on any European Site when considered in combination with other plans and projects.

In the review of the projects 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 Project.

Taking into consideration the reported residual impacts from other plans and projects in the area and the predicted impacts with the current proposal, no residual cumulative impacts have been identified with regard to any European Site.

## 9. **CONCLUDING STATEMENT**

This NIS has provided an assessment of all potential direct or indirect adverse effects on European Sites.

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 Project do not adversely affect the integrity of European sites.

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

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