

Appropriate Assessment Screening Report and Natura Impact Statement

Crumhach Wind Farm, Co.
Sligo



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GLOSSARY OF TERMS

Term	Definition
Qualifying Interests	The specific habitats or species for which Special Areas of Conservation (SACs) are designated under the EU Habitats Directive
Biological Q-Rating	A scientific method used to assess water quality in rivers and streams, in Ireland; developed by the EPA
Proposed Biodiversity Enhancement Area	Area within the Site Boundary set aside exclusively to manage and enhance biodiversity.
Special Areas of Conservation	Designated for habitats (e.g., active raised bogs, reefs) and non-bird species listed under the EU Habitats Directive.
Special Conservation Interests	Specific species or habitats for which a site is designated as a Special Protection Area (SPA), primarily focusing on rare, vulnerable, or migratory birds, as well as wetlands
Special Protection Areas	Designated specifically for the protection of wild birds and their habitats under the Birds Directive.

GLOSSARY OF ACRONYMS

Acronym	Definition
AASR	Appropriate Assessment Screening Report
BMEP	Biodiversity Management and Enhancement Plan
BTO	British Trust for Ornithology
DAU	Development Applications Unit
DEM	Digital Elevation Model
DTM	Digital Terrain Model
ECOW	Ecological Clerk of Works
EDNA	Environmental DNA
EQSs	Environmental Quality Standards
GWBs	Groundwater Bodies
IFI	Inland Fisheries Ireland
ITM	Irish Transverse Mercator
JTF	Just Transition Fund

MS	Microsoft
MV	Medium Voltage
NIS	Natura Impact Statement
NHA	Natural Heritage Area
NPWS	National Parks and Wildlife Service
OPR	Office of the Planning Regulator
OTE	Over the Edge Drainage
PCH	Potential Collision Height
pNHA	Proposed Natural Heritage Area
QI	Qualifying Interest
RED	Renewable Energy Directive
SAC	Special Area of Conservation
SCADA	Supervisory Control and Data Acquisition
SCI	Special Conservation Interest
SSCO	Site Specific Conservation Objectives
SNH	Scottish Natural Heritage
SPA	Special Protection Area

1.

INTRODUCTION

1.1

Background

MKO has been appointed by SSE Renewables (Ireland) Ltd. to provide the information necessary to allow the competent authority to conduct an Article 6(3) Appropriate Assessment of a proposed wind farm development comprising the removal of 23 no. existing turbines on the existing Dunneill (13 no. turbines) and Kingsmountain (10 no. turbines) Wind Farm sites, their replacement with 17 no. wind turbines across both existing wind farm sites and additional greenfield sites in the townlands of Crowagh or Dunneill Mountain, Tawnadremira, and Ballyglass, Doonbeakin, Dunowla, Kingsmountain and Ballygreighan Barr in Co. Sligo, and all ancillary works.

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 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)
- Appropriate Assessment Screening for Development Management. Office of the Planning Regulator, Dublin 7, Ireland OPR (2021).

1.2

References to Proposed Project

For the purposes of this NIS, the various project components are described and assessed using the following references:

- Where the '**Proposed Project**' is referred to this encompasses the entirety of the project for the purposes of this assessment.
- Where the '**Proposed Wind Farm**' is referred to, this refers to turbines and associated foundations and hard-standing areas, access tracks, temporary construction compounds, onsite 110kV substation, internal underground cabling, onsite LiDAR compounds, peat and spoil management, site drainage, biodiversity enhancement, turbine delivery route (TDR) accommodation works and all ancillary works and apparatus.
 - The '**Proposed Turbines**' refers to the 17 no. turbines associated with the Proposed Wind Farm as outlined above.
- Where the '**Proposed Grid Connection Route**' is referred to this encompasses the 110kV underground cabling connecting the proposed onsite 110kV substation to the existing Srananagh 220kV substation, and all ancillary works and apparatus.

- Where the ‘**Existing Wind Farm**’ is referred to, this relates to all components of the existing Dunneill and Kingsmountain Wind Farm developments.
 - Where differentiation is required between the Dunneill and Kingsmountain Wind Farms within this report these are called out as necessary.
- Where the ‘**Site**’ and the ‘**Site Boundary**’ are referred to, this relates to the area comprising the Proposed Wind Farm.
- Where the ‘**Existing Grid Connection**’ is referred to, this relates the existing underground cabling connecting the existing onsite control buildings for the Existing Wind Farm to the existing Cunghill 110kV substation.

1.3

Statement of Authority

The baseline terrestrial ecological surveys were undertaken by Rachel Minogue (B.Sc., Environmental Science), Fiona Kileen (BSc, Env), Tom Peters (B.Sc., M.Sc.), Colin Murphy (B.Sc., M.Sc.), Katy Beckett (B.Sc., M.Sc.), Matthew Kieran (B.Sc.), Julie Kohlstruck (B.Sc., M.Sc.), Niamh Rowan (B.Sc.) and Rudraksh Gupta (B.Sc., M.Sc.) throughout 2023, 2024, 2025 and 2026. Aquatic baseline surveys were undertaken by Triturus Environmental Ltd. as detailed in **Appendix 1**.

Ornithological field surveys were undertaken by Andrew O'Donoghue (B.Sc.), Cillian Murphy (B.Sc.), Clodagh Helen, Collin Delahunt, Conor Rowlands (B.Sc.), Eoghan Phelan (B.Sc.), Lee Dark (M.Sc.), Niall Mc Hugh (B.Sc.) and Niamh Scanlon (B.Sc.). The ornithological survey scope was devised by Padraig Cregg, Principal Ecologist with MKO.

This report has been prepared by Julie Kohlstruck (B.Sc., M.Sc.), Julie is a Project Ecologist with 5 years' experience in conducting Ecological Impact Assessments and Stage 1 and Stage 2 Appropriate Assessment reporting for a wide range of infrastructure developments including renewable wind energy projects.

This report has been reviewed by Rachel Walsh (BSc. Env., MCIEEM). Rachel is a Senior Ecologist with 6 years' experience in professional ecological consultancy and is a full member of CIEEM with a First-Class Honours BSc in Environmental Science. Rachel's key strengths are in terrestrial flora and fauna ecology, including Irish Vegetation Classification surveys, Annex I habitat surveys, habitat mapping and mammal surveys. Rachel has extensive experience in writing and review of Appropriate Assessment reporting, Ecological Impact Assessment and EIA inputs. Since joining MKO, Rachel has worked widely on renewable energy infrastructure projects, wastewater infrastructure projects, extractive industry and residential projects. She also manages a team of ecologists within the company.

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 (IROPI¹).

1.4.2

Desk Study Methodology

The desk study undertaken for this assessment included a thorough review of the available ecological data associated with the screened-in European Sites within the Likely Zone of Influence of the Proposed Project. 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),
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper,
- Review of NPWS Article 17 metadata and GIS database,
- Review of the Irish Wetland data base web-mapper.

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

- A data request was sent to the NPWS on the 05/09/2025 for records of Rare and Protected Species for the hectads in which the Proposed Project is located and a response was received on the 01/10/2025.
- Search for Site-specific information regarding QI/SCI species or habitats outside of the resources listed above, including:
 - Moorkens, E.A. & Killeen, I.J. (2011) Monitoring and Condition Assessment of Populations of *Vertigo geyeri*, *Vertigo angustior* and *Vertigo moulinsiana* in Ireland. Irish Wildlife Manuals, No. 55. National Parks and Wildlife Service, Department of Arts, Heritage and Gaeltacht, Dublin, Ireland.
 - Perrin, P.M., Roche, J.R., Barron, S.J., Daly, O.H., Hodd, R.L., Muldoon, C.S. & Leyden, K.J. (2013). National Survey of Upland Habitats (Phase 3, 2012-2013), Site Report No. 10: Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
 - Perrin, P.M., Barron, S.J., Roche, J.R. & O'Hanrahan, B. (2014). Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland. Version 2.0. Irish Wildlife Manuals, No. 79. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

MKO undertook a scoping exercise during preparation of the NIS and accompanying Environmental Impact Assessment Report (EIAR) included with the planning application for the Proposed Project.

Full copies of all scoping responses are included in Appendix 2-1 of the accompanying EIAR. The recommendations of the consultees have informed the NIS preparation process and the contents of this chapter. Table 1-1 below provides a list of the organisations consulted with regard to biodiversity during the scoping process and notes where scoping responses were received.

Table 1-1 Organisations consulted with regard to biodiversity

Consultee	Date of Response	Response Summary	Addressed in Section
Bat Conservation Ireland	07/10/2024	No comment	N/A
Butterfly Conservation Ireland	No response received	N/A	N/A
Birdwatch Ireland	No response received	N/A	N/A
Department of Housing, Local Government and Heritage: Development Applications Unit (includes National Parks & Wildlife Service and the National Monuments Service)	09/09/2024	NPWS consultation detailed in Section 3.2	3.2
Inland Fisheries Ireland	No response received	N/A	N/A
Irish Peatland Conservation Council	No response received	N/A	N/A
Irish Wildlife Trust	9 September 2024	No comment	N/A

Sligo County Council: Environment Department		The Proposed Project will be assessed for its potential impact on Natura 2000 sites	Throughout this NIS
The Heritage Council	No response received	N/A	N/A

1.4.2.1 Consultation with National Parks and Wildlife Service

Members of the Project Team, including Environmental Scientists, Ecologists and Ornithologists met with the National Parks and Wildlife Service (NPWS) on the 10th February 2026 to discuss the Proposed Project. The main topics discussed in the meeting included the following:

- > An overview of the Proposed Project.
- > Ecological surveys which have been undertaken to date and their findings.
- > Ornithology surveys which have been undertaken to date and their findings.
- > The Key Ecological Receptors identified at the Site.
- > Proposed plans for habitat enhancement and management measures.

The outcome of the meeting is detailed in Section 3.2.

1.4.3 Ecological Survey Methodologies

Comprehensive surveys of the biodiversity of the Site were undertaken to inform this Appropriate Assessment Screening Report and Natura Impact Statement. 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 throughout 2023, 2024, 2025, and 2026 and are summarised in Table 1-2 below.

Details of ornithological surveys undertaken to inform this Appropriate Assessment Report are presented in Section 1.4.4 below.

Table 1-2. Ecology Surveys Informing the Appropriate Assessment Report.

Survey Type	Dates
Multi-disciplinary walkover (incl. habitats)	> 21/06/2023 > 04/07/2023 > 02/08/2023 > 02/07/2024 > 03/07/2024 > 16/09/2025 > 17/09/2025 > 18/09/2025.
Detailed Botanical Surveys	> 02/07/2024 > 03/07/2024 > 16/09/2025 > 17/09/2025 > 18/09/2025 > 26/03/2026 > 13/05/2026
Aquatic surveys (including otter)	> 02/07/2024 > 03/07/2024 > 04/07/2024 > 05/07/2024 > 06/07/2024 > 07/07/2024 > 11/09/2024 > 12/09/2024 > 13/09/2024 > 14/09/2024
Terrestrial Surveys of Proposed Grid Connection	> 16/09/2025 > 17/09/2025 > 18/09/2025
Terrestrial Surveys of Proposed Turbine Delivery Route	> 02/03/2026
Detailed habitat assessment of the Proposed Enhancement Area	> 19/02/2026

1.4.3.1 Ecological Multidisciplinary Walkover Survey

Multidisciplinary walkover surveys were undertaken within the Site on the dates outlined in Table 1-2 above. Surveys were undertaken within the recognised optimum period for vegetation surveys/habitat

mapping, i.e. April to September (Smith *et al.*, 2011)². A comprehensive walkover of the entire Site was completed with incidental records also incorporated from other dedicated species/habitat specific surveys. During the multidisciplinary surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was conducted.

The multi-disciplinary walkover surveys comprehensively covered the entire Site and based on the survey findings, further detailed targeted surveys were carried out for features and locations of ecological significance. These surveys were carried out in accordance with the TII *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna* on National Road Schemes (TII, 2009).

Other targeted survey methodologies undertaken within the Site are described in the following subsections.

1.4.3.2 Aquatic surveys

Dedicated aquatic surveys were undertaken in the vicinity of the Proposed Wind Farm and the Proposed Grid Connection Route on the 2nd-7th July and 11th-14th September 2024. All freshwater watercourses which could be affected directly or indirectly by the Proposed Project were considered as part of this assessment. Survey effort focused on both instream and riparian habitats at each aquatic sampling location. Surveys at each of these sites included a fisheries assessment consisting of electro-fishing and/or fisheries habitat appraisal.

A single anode Smith-Root LR24 backpack (12V DC input; 300V, 100W DC output) was used to electro-fish sites at target locations within the vicinity of the Proposed Project, following notification to Inland Fisheries Ireland and under the conditions of Department of the Environment, Climate and Communications (DECC) licences. The electro-fishing survey was undertaken across 61 no. riverine sites, these are detailed in the Aquatic Baseline Report Appendix 1.

Both river and holding tank water temperature was monitored continually throughout the survey to ensure temperatures of 20°C were not exceeded, thus minimising stress to the captured fish due to low dissolved oxygen levels. A portable battery-powered aerator was also used to further reduce stress to any captured fish contained in the holding tank. Salmonids, European eel and other captured fish species were transferred to a holding container with oxygenated fresh river water following capture. To reduce fish stress levels, anaesthesia was not applied to captured fish. All fish were measured to the nearest millimetre and released in-situ following a suitable recovery period. Electro-fishing methodology followed accepted European standards (CEN, 2003) and adhered to best practice (Central Fisheries Board, 2008).

The presence of otter (*Lutra lutra*) was determined through the recording of otter signs in line with the methodology outlined in Section 1.4.3.3 below.

1.4.3.3 Otter Surveys

Targeted otter (*Lutra lutra*) surveys were undertaken along the along the watercourses within the Proposed Wind Farm and along the Proposed Grid Connection Route where it traversed in the vicinity of watercourses, including on the Unshin river at the location of the Proposed Grid Connection Route. This river at this location is a component of the Unshin River SAC (001898), for which otter is a listed Qualifying Interest species.

The otter surveys were conducted as per TII (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes). This involved a search for all otter signs e.g. spraints, scat, prints, slides, trails, couches and holts within 150m radius of each

² (Smith *et al* 2011)- *Best Practice Guidance for Habitat Survey and Mapping*. Available at https://www.heritagecouncil.ie/content/files/best_practice_guidance_habitat_survey_mapping_onscreen_version_2011_8mb.pdf

survey site. Notes on the age and location of signs (ITM coordinates) were made, in addition to the quantity and visible constituents of spraint (i.e. remains of fish, crustaceans, molluscs etc.)

In addition to the width of the rivers/watercourses, a 10m riparian buffer (both banks) were surveyed as part of the potential otter habitat as informed by relevant guidance (NPWS, 2009).

The dedicated otter survey also followed the guidance as set out in (TII (2008) ‘Guidelines for the Treatment of Otters Prior to the Construction of National Roads Schemes’ and following CIEEM best practice competencies for species surveys (CIEEM, 2013).

1.4.3.4 Geyer’s Whorl Snail Habitat Suitability Assessment

Geyer’s whorl snail (GWS, *Vertigo geyeri*) is a listed Qualifying Interest (QI) species of Ox Mountains Bog SAC [002006]. A parcel of this SAC which is known to host a population of GWS, is located to the northern extent of the Site Boundary. There is no infrastructure associated with the Proposed Wind Farm to be located within this parcel of habitat known to host GWS.

Habitat suitability assessments for Geyer’s whorl snail were conducted within the boundary of the Proposed Wind Farm throughout the course of the ecological multidisciplinary walkover surveying effort. Habitat suitability for this species followed the guidance provided in Irish Wildlife Manual No. 55 - (Moorkens and Killeen, 2011), ‘Monitoring and Condition Assessment of Populations of *Vertigo geyeri*, *Vertigo angustior* and *Vertigo moulinsiana* in Ireland’).

Regarding the species’ habitat needs the Manual states,

‘Vertigo geyeri is stringent in its requirement of saturated water conditions in calcareous, groundwater-fed flushes that are often limited in size to a few metres square. Their habitats often occur in mosaics of suitable patches within wider fen macrohabitats, that in Ireland can themselves fall within habitats as diverse as raised bog laggs, transition mires, lake shores, hill or mountain slopes, and wetlands associated with coastal dunes and machair (Moorkens, 2003b). Within these macrohabitats, however, the snail is consistent in where it lives, within the saturated and decaying roots of small calcareous sedges (particularly Carex viridula ssp. brachyrrhyncha), associated fen mosses (particularly Drepanocladus revolvens and Campyllum stellatum). The greatest indicator of optimum V. geyeri habitat is the presence of a tufa-forming spring.’

The Irish Wildlife Manual goes on to describe optimal, sub-optimal and unsuitable habitat conditions for the snail. Sub-optimal habitat is described as habitat where,

‘there are patches of vegetation and conditions that support V. geyeri but the majority of the habitat cannot. This can be due to terrain being generally too high, but with small suitably wet runnel flushes occurring within, or where habitat is on the margin of base tolerance for the species, where acid influence promotes mainly calcifuge species, but where occasional groundwater seepage influence provides a suitable patch that the snail can occupy.’

Unsuitable habitat is described as being ‘where the combination of vegetation and hydrological influence is entirely outside the snail’s range of tolerance.’

The above information informed the assessment of habitats within the Site to support the species.

1.4.4 Bird Surveys

Field surveys were undertaken during the survey period April 2021 to March 2025, consisting of four breeding seasons (April – September) and four winter seasons (October – March). This survey work forms the core dataset for the assessment of impacts on ornithology. The data provided in the field surveys is robust and allows clear, precise and definitive conclusions to be made on the ornithological

receptors identified. 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’ from NatureScot (formerly Scottish Natural Heritage [SNH]) outlined in SNH (2017) which was revised in NatureScot (2025). Surveys remain in accordance with the updated guidance.

The various field surveys undertaken are described in detail below including a description of the area surveyed and its radius from the Study Area, which depended on the methodology and focal species. All survey effort and location maps are presented in **Appendix 2**.

Surveys were focused on target species; species listed as SCIs of nearby SPAs.

1.4.4.1 Vantage Point Surveys

Vantage point surveys were undertaken in accordance with SNH (2017; revised in NatureScot, 2025) to monitor flight activity. The area surveyed provided coverage to a 500m radius of the Proposed Turbines. Surveys were conducted from eight fixed vantage points with comprehensive coverage of the Proposed Wind Farm. 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. The survey locations are shown in **Appendix 2**.

Viewsheds were calculated using the Visibility Analysis plugin (Version 1.8) over a raster digital terrain model (DTM) in QGIS (Version 3.28). Note that while the relevance of being able to view as much of the 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 20m 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 a 360° viewshed 20m from ground level up to a 2km radius around the vantage point. This viewshed was then cropped to a 180° arc representing the area visible to the surveyor. Once the three turbine model scenarios were confirmed to have a lowest swept height of 30m, 30.5m and 43.4m, the viewsheds were recalculated using a notional layer suspended at 30m, 30.5m and 43.4m. The viewsheds provided adequate coverage of the Proposed Wind Farm site for a collision risk assessment to be undertaken.

Survey methodology followed SNH (2017; revised in NatureScot, 2025). 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 3hour watches separated by a minimum 30minute break (i.e., 6 hours total) per month. Surveys were conducted from May 2021 to March 2025 inclusive, 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. In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat.

Surveys at VP1 started in May 2021 to inform the extension of life application for the Existing Dunneill Wind Farm (Dunneill Wind Farm, Co. Sligo, PL 22/291) and continued at this location until March 2025. Surveys at VP2 also started in May 2021 to inform the extension of life application for the Existing Dunneill Wind Farm. Surveys ceased at this location after the grant permission in May 2023 but recommenced in October 2023 to inform the EIAR for the proposed Crumhach Wind Farm. During the winter season 2024-2025, surveys were only conducted at VP1, VP2, VP6 and VP8 to be concurrent with collision monitoring at the Existing Wind Farms of Dunneill and Kingsmountain; surveys at the remaining vantage point survey locations ceased in September 2024. These surveys provide data from over 1,933 hours of dedicated flight activity watches at the Proposed Wind Farm.

Note that three hours of surveys were missed at VP4, VP7 and VP8 during the breeding season 2022. However, this is not considered a significant limitation in the data given that there are data from three breeding seasons available for analysis. VP3, VP4 and VP7 were respectively conducted the 28th, 30th and 29th of September 2021 but are used here to inform the winter season 2021/2022. While this is outside of the winter season (1st October – 31st March), this is not considered to be a significant limitation in the data as the discrepancy of three days is unlikely to result in a significantly different assemblage of observed species or activity, therefore it has been treated as a winter season survey in this dataset. Similarly, VP1 and VP2 were conducted respectively on the 3rd of October and 4th of October 2022 but inform the breeding season 2022. Finally, VP7 was missed in September 2023, but was done twice in October 2023.

Table 1-3. Vantage point survey duration.

Survey Season and Number of Vantage Points (shown in Appendix 2)	Effort per Vantage Point
Breeding season 2021 (VP1, VP2)	36 hours per Vantage Point
Winter season 2021/2022 (VP1, VP2, VP3, VP4, VP5, VP6, VP7, VP8)	36 hours per Vantage Point (including surveys on 28 th , 29 th and 30 th September 2021)
Breeding season 2022 (VP1, VP2, VP3, VP4, VP5, VP6, VP7, VP8)	36 hours at VP1, VP2, VP3, VP4 and VP6 (including surveys on 3 rd and 4 th October 2022); 33 hours at VP4, VP7 and VP8
Winter season 2022/2023 (VP1, VP2, VP3, VP4, VP5, VP6, VP7, VP8)	36 hours per Vantage Point
Breeding season 2023 (VP1, VP2, VP3, VP4, VP5, VP6, VP7, VP8)	36 hours at VP1, VP2, VP3, VP4 and VP6; 39 hours at VP4 and VP8; 33 hours at VP7; 12 hours at VP2
Winter season 2023/2024 (VP1, VP2, VP3, VP4, VP5, VP6, VP7, VP8)	36 hours at VP1, VP2, VP3, VP4, VP5 and VP8; 42 hours at VP7
Breeding season 2024 (VP1, VP2, VP3, VP4, VP5, VP6, VP7, VP8)	36 hours per Vantage Point
Winter season 2024/2025 (VP1, VP2, VP6, VP8)	36 hours per Vantage Point

Flight activity of target species was mapped and recorded according to defined flight bands, chosen in relation to the dimensions of potential turbine models for the site. Two sets of height bands were used during Vantage Point Surveys. This is because some surveys were conducted at existing turbines to inform the extension of life application for the Existing Dunneill Wind Farm, while later surveys were conducted to inform the application for the Proposed Project. Surveys for the Proposed Turbines used four bands : 0-15m, 15-25m, 25-200m and >200m. Surveys for the Existing Wind Farm turbines used five bands: 0-15m, 15-23m, 23-75m, 75-200m and >200m. Survey data were collected using five bands between May and September 2021; between October 2021 and March 2025, the four bands were used. At VP2, the five bands were used from May 2021 to November 2022, and in March, April, and November 2023. All other surveys were conducted using the four bands. At VP3, the five bands were used only in November 2021; in all other months, the four bands were used. At VP4, the five bands were used only in November 2021 and in October 2023; all other surveys conducted at VP4 used the four bands. At VP5 and VP6, the five bands were used in November and December 2021 and in October 2023; all other surveys conducted at VP5 and VP6 used the four bands. At VP7 and VP8, the

five bands were used in November and December 2021 and in November 2023; all other surveys conducted at VP7 and VP8 used the four bands.

All flight activity within the following height bands 23-75m, 75-200m, 75-250m and 150m+ are considered to be within the Potential Collision Height (PCH) with regard to the turbine swept area. The varying height bands have been accounted for in the collision risk assessment.

1.4.4.2 Winter Walkover Surveys

Winter walkover surveys were undertaken to record the presence of bird species within or in proximity to the Study Area (as shown in Appendix 2). The area surveyed was the Study Area to a 500m radius, including areas between vantage point locations. The methodology was adapted from the breeding walkover methodology outlined in Brown and Shepherd (1993) and Calladine *et al.* (2009), combined with Common Bird Census methods (British Trust for Ornithology, 2021). Winter walkover surveys were conducted in daylight hours over four visits between October and March (i.e., four visits in winter 2021/2022, four visits in winter 2022/2023 and four visits in winter 2023/2024). Some dense conifer plantations near Crowagh or Dunneill Mountain did not allow the surveyor access and these were surveyed from the forestry tracks.

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.

1.4.4.3 Breeding Walkover Surveys

Breeding walkover surveys were undertaken to determine possible, probable or confirmed breeding bird activity within or in proximity to the Study Area. The area surveyed was the Study Area to a 500m radius. The methodology was based on Brown and Shepherd (1993) and Calladine *et al.* (2009) Bird Census methods (British Trust for Ornithology, 2021) for dense habitat. Breeding walkover surveys were conducted in daylight over four visits during the core breeding season months April to July. It is acknowledged that half a day of survey was conducted on the 3rd of August 2023. While this is technically outside of the breeding season core months (1st April – 31st July), this is not considered to be a significant limitation in the data as the discrepancy of three days is unlikely to result in a significantly different assemblage of observed species or activity. Some dense conifer plantations near Crowagh or Dunneill Mountain did not allow the surveyor access and these were surveyed from the forestry tracks.

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 codes³. In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat.

1.4.4.3.1 Breeding Raptor Surveys

Raptors include all harrier, falcon, buzzard, eagle, hawk, owl, kite and osprey species. Breeding raptor surveys were undertaken within 2km of the Study Area to identify occupied territories and monitor their breeding success near or within the Study Area. Survey methodology followed Hardey *et al.* (2013). Each breeding raptor location was surveyed once per month during the core breeding season between April and July. The survey locations are shown in **Appendix 2**.

Breeding raptor watches of 3 hours (supplemented by transects if necessary) were conducted during daylight at 10 breeding raptor survey locations (BR1 to BR10) during breeding season 2022 and 2023.

³ <https://www.bto.org/ourscience/projects/birdatlas/methods/breeding-evidence>.

During the breeding season of 2024, BR5 and BR9 were moved to new locations (BR11 and BR12) to survey new areas suitable for breeding raptors and investigate potential activity of interest. In May 2024, BRT1 was created to survey the southern part of the site for raptor breeding activity, and BRT6 was created to survey the adjacent areas of BR6. In July 2024, some survey locations were moved (BRT12, BRT12a, BRT12b, BRT12c, BRT12d, BRT13) in response to potentially interesting merlin activity across the site. One survey was conducted on the 3rd of August 2023, to compensate a missed survey during the core breeding season. While this is technically outside of the breeding season core months (1st April – 31st July), this is not considered to be a significant limitation in the data as the discrepancy of three days is unlikely to result in a significantly different assemblage of observed species or activity.

All raptor species observed were recorded and mapped and breeding status was assigned following British Trust for Ornithology (BTO) breeding status codes. Surveyors did not approach nest sites to avoid disturbance.

2. DESCRIPTION OF PROPOSED DEVELOPMENT

2.1 Site Location

The Proposed Wind Farm is located on the northwest slopes of the Ox Mountains, located approx. 4.5km south of the village of Dromore West, and approx. 3km southwest of the village of Templeboy in Co. Sligo, at their nearest points (approximate site midpoint, Irish Grid Reference: G 45598 28086).

The Proposed Wind Farm is accessed via the L6309 and L2702 Local Roads off the N59 National Road, travelling in an east-west direction north of the site and the N17 National Road, which runs in a north-south direction to the southeast of the Proposed Wind Farm site. The current entrance to the Existing Wind Farm is proposed as the main site entrance, utilising the existing access roads and infrastructure.

It is intended to connect the onsite 110kV substation to the existing Srananagh 220kV substation in the townland of Ballysumaghan, Co. Sligo via 110kV underground electrical cabling. The exact connection node is to be confirmed by EirGrid and subject to change at their request. The underground electrical cabling route is approx. 41.6km in length and located primarily within the public road corridor, with approx. 130m located within the Proposed Wind Farm.

The Proposed Grid Connection Route will originate at the proposed onsite 110kV substation and run west for approx. 130m through proposed new site roads before turning north for 400m along the L2702 Local Road. The Proposed Grid Connection Route will continue east and then north along the L6309 Local Road network for approx. 6.6km. The Proposed Grid Connection Route then follows the N59 National Road east for 26.2km before continuing southeast for 6.9km on the R290 Regional Road. The Proposed Grid Connection Route then joins the R284 Regional Road heading southeast for 2.8km on the L6234 Local Road before heading east onto the L5204 Local Road for 1.8km. From the L5204 the Proposed Grid Connection Route turns left and travels a final 400m into the existing Srananagh 220kV substation.

2.2 Characteristics of the Proposed Project

The Proposed Project will comprise the removal of 23 no. existing turbines and the construction of 17 no. new turbines and all associated works. The Proposed Project will utilise the Existing Grid Connection and involve the construction of a new underground cable connection the existing Srananagh 220kV substation to connect the Proposed Project to the National Grid.

The current planning application, relating to the Proposed Project is being made to ACP under Section 37E of the Planning and Development Act, 2000, as amended.

The development description for the current planning application as appears in the public notices is as follows:

The Proposed Project will consist of the provision of the following:

- *Removal of 23 no. existing turbines permitted under Sligo County Council Ref. No. 97/469, 02/846, 03/619 (the latter granted on appeal by An Coimisiún Pleanála PL21.204790) and 22/291;*
- *Erection of 17 no. wind turbines within the following parameters:*
 - *a turbine tip height range of 176.6 metres to 180 metres;*
 - *a rotor diameter range of 133.2 metres to 150 metres; and*
 - *a hub height range of 105 metres to 110 metres.*

- *Permanent turbine foundations, hard-standing and assembly areas;*
- *A new permanent 110kV electrical substation compound including control buildings (with a combined floor area of 654sq.m) incorporating welfare facilities, all associated electrical plant and apparatus, security fencing, underground cabling, lightning protection poles, an underground wastewater holding tank, drainage and all ancillary works;*
- *Upgrade of and permanent continued use of 2 no. existing onsite control buildings comprising: 1 no. control building located in the townland of Tawnadremira (with a floor area of c. 118.4sqm), permitted under Sligo County Council Planning References 03/619 (granted on appeal by An Coimisiún Pleanála PL21.204790), 10/371, and 22/291; and 1 no. control building located in the townland of Kingsmountain (with a floor area of c.71sqm), permitted under Sligo County Council Planning References 97/469 and 03/382.*
- *Underground electrical and communications cabling connecting the proposed wind turbines to the existing onsite control buildings and the proposed 110kV on-site electrical substation;*
- *4 no. temporary construction compounds with site offices and welfare facilities (with a combined floor area of 324 sqm);*
- *Upgrade of 1 no. existing site entrance off the L6309 in the townlands of Ballyglass and Crowagh or Dunneill Mountain;*
- *1 no. new site entrance off the L6309 in the townlands of Ballyglass and Crowagh or Dunneill Mountain;*
- *Upgrade of 1 no. existing site entrance off the L2702 in the townland of Crowagh or Dunneill Mountain;*
- *2 no. new site entrances off the L2702 in the townland of Crowagh or Dunneill Mountain;*
- *Upgrade of existing site tracks and provision of new site access tracks, clear span crossings, junctions and hard-standing areas;*
- *Accommodation works along the N59 in the townlands of Corhawnagh and Abbeytown, along the R297 in the townland of Knockaculleen, along the L2702 in the townland of Lecarrow and Dromore, along the L2702 in the townland of Rathgoonaun and along the L2702 and L6309 in the townland of Crowagh or Dunneill Mountain, to facilitate the delivery of turbine components and other abnormal sized loads to site;*
- *A new temporary access road off the L2702 to the L6309 in the townlands of Crowagh or Dunneill Mountain;*
- *3 no. temporary borrow pits;*
- *2 permanent LiDAR compounds;*
- *Peat and Spoil Management areas;*
- *Tree felling and hedgerow removal;*
- *Biodiversity Management and Enhancement measures (inclusive of peatland restoration and management);*
- *Site Drainage;*
- *Operational stage site signage; and*
- *All ancillary apparatus and site development works above and below ground, including soft and hard landscaping and drainage infrastructure.*

The application is seeking a ten-year planning permission for a thirty five-year operational life from the date of full commissioning of the wind turbines and subsequent decommissioning.

Modern wind turbine generators currently have a typical generating capacity in the 4 to 8MW range, with the generating capacity continuing to evolve upwards as technology improvements are achieved by the turbine manufacturers. For the purposes of this application, it is assumed that the wind turbine model installed as part of the Proposed Project will have a generating capacity of 102 MW. The actual turbine procured as part of a competitive tender process may have a generating potential that is lower

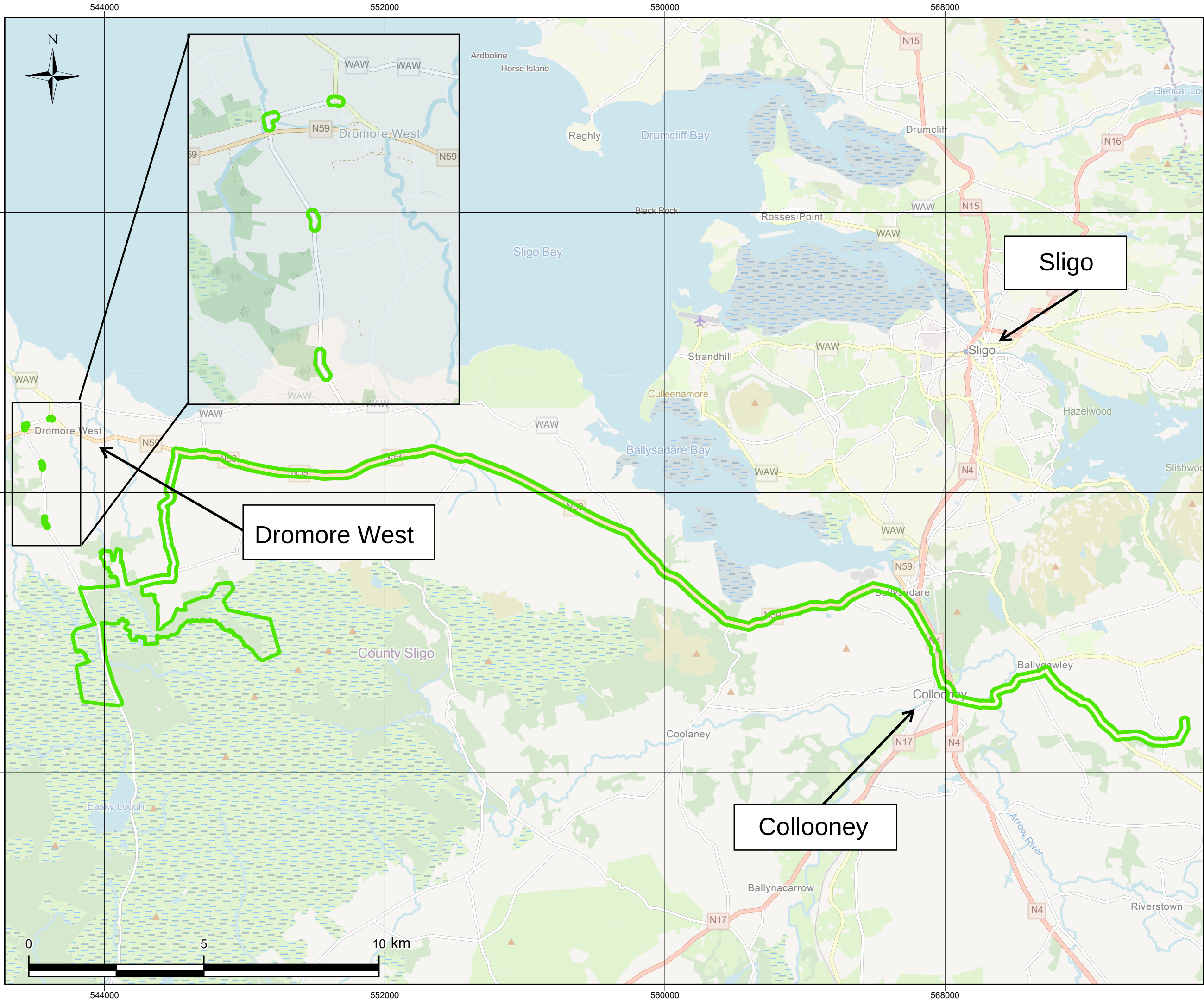
or greater than the turbines described in the EIAR. Irrespective of the power output of the actual turbine procured, the conclusions of the EIAR will not be materially affected.

The layout of the Proposed Project has been led by consideration of constraints and facilitators, thereby avoiding the environmentally sensitive parts of the site). The Proposed Project also aimed to make use of as much of the existing infrastructure from the Existing Wind Farm (i.e., access roads, areas of hardstanding, electrical infrastructure) as possible in order to reduce the environmental impact. There will be approx. 8.9km of existing roadways to be upgraded and used to facilitate the Proposed Project. There will only be approx. 4.6km of new access roads to be constructed as part of the Proposed Project.

The Proposed Project has also been designed in line with the setback distance from sensitive receptors outlined in the Draft DoHPLG 2019 Guidelines.

The Existing Wind Farm site entrance off the L6309 Local Road will be upgraded and used as the main site entrance of the Proposed Wind Farm. Upgrades to 3 no. additional existing access points are proposed as site entrances for general construction traffic and the delivery of large turbine components and other abnormal sized loads throughout the construction phase. 1 no. new site entrance is proposed off the L2702 Local Road which will be used as the entrance to access the proposed onsite 110kV substation. Appropriate sightlines will be established at all proposed site entrances for the safe egress of traffic during the construction phase. A total of 4 no. site entrances will be upgraded, and 1 no. new entrance will be constructed for the Proposed Project, all of which will be used during the operational phase of the Proposed Project.

All elements of the Proposed Project have been assessed as part of this Appropriate Assessment Screening Report and Natura Impact Statement.



Map Legend

EIAR Site Boundary

Spatial Reference
Name: IREN95 Irish Transverse Mercator
Datum: IREN95
Projection: Transverse Mercator

SITE LOCATION - NOT TO SCALE

EIAR Site Location Context

Project Title
Crumhach Wind Farm, Co. Sligo

Project No. 230841	Drawing No. 2-1	Scale 1:100,000
Drawn By MVN	Checked By BT	Date 04/08/2026

Email: info@mkoireland.ie / Website: www.mkoireland.ie

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2.3 Proposed Project Components

2.3.1 Proposed Wind Farm

2.3.1.1 Wind Turbines

The layout of the Proposed Turbines has been optimised using wind farm design software (WindPro) to maximise the energy yield from the Proposed Wind Farm, while maintaining sufficient distances between the Proposed Turbines to ensure turbulence and wake effects do not compromise turbine performance. The ITM Grid Reference coordinates of the Proposed Turbines are listed in Table 2-1 below.

Table 2-1. Proposed Wind Turbine Locations.

Turbine	ITM Coordinates		Top of Foundation Elevation (mOD)
	Easting	Northing	
T1	543507	826746	164
T2	543440	827861	180.5
T3	543602	826404	175
T4	543655	827452	185
T5	543941	826036	181
T6	544012	828489	185
T7	544519	828995	156
T8	545257	828620	187
T9	545425	828224	211
T10	546041	828377	240
T11	546688	828662	240
T12	544272	828806	252
T13	547412	829297	230
T14	547754	828353	272
T15	548292	828210	339
T16	548570	827462	302
T17	548194	827756	272

2.3.1.2 Site Investigations

As part of the design process for the Proposed Project, numerous intrusive site investigations were undertaken across the Proposed Wind Farm, to provide detail and clarity on the nature and extent of sublayers and bedrock as a means of characterising the Proposed Wind Farm. This assisted in providing additional information on the most suitable location for turbines and associated infrastructure. Intrusive Peat Probing was carried out in 2023, 2024, 2025 and 2026 at 902 no. locations across the Site by MKO and Fehily Timoney and Company (FTC).

Geotechnical ground investigations (i.e. trial pitting) were undertaken in July 2025, under the supervision of FTC. The objectives of the intrusive site investigations included mapping the subsoil lithology for all proposed turbines and other identified locations and assessing the underlying bedrock. This data was used to inform the final layout of the Site.

In summary, a total of 20 no. trial pits, supervised by FTC, were carried out at 13 no. Proposed Turbines and at other identified locations in proximity to proposed borrow pit to investigate the underlying mineral soil lithology and subsoil/bedrock interface. The complete geotechnical ground investigations were carried out in accordance with IS EN 1997-2 and BS5930:2015+A1:2020 Code of Practice for Ground Investigations with precedence given to IS EN 1997-2 where applicable.

The geotechnical ground investigations were further supplemented by trial pit logs completed during the development of the Existing Wind Farm.

2.3.1.3 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 Turbines to be installed on the Proposed Wind Farm site will have the following dimension range:

- Turbine Tip Height Maximum height 180 metres, Minimum height 176.6
- Hub Height – Maximum height 110 metres, Minimum height 105 metres
- Rotor Diameter – Maximum diameter 150 metres, Minimum diameter 133.2 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 as part of the Proposed Project 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.

The Proposed Turbines will be multi-ply coated to protect against corrosion. It is proposed that the turbines would be of a light grey colour to blend into the sky background to minimise visual impact as recommended in the 2006 Guidelines and ‘The Influence of Colour on the Aesthetics of Wind Turbine Generators’ (ETSU, 1999).

A drawing of the Proposed Turbines is shown in the Proposed Project Drawings in **Appendix 3**. **Appendix 3** also show the turbine base layout, including turbine foundations, hard standing areas, assembly areas, access roads and surrounding works areas.

2.3.1.4 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, depending on the requirements of the final turbine supplier, however, a foundation area large enough to accommodate modern turbine models has been assessed in this report, adopting a precautionary approach. The turbine foundation transmits any load on the wind turbine into the ground. The horizontal and vertical extent of the turbine foundation will be 25m and 4m respectively. Where ground conditions are unfavourable to excavate and replace, piles will be installed to formation level.

After the foundation level of each turbine has been formed using piling methods or on competent strata (i.e., bedrock or subsoil of sufficient load bearing capacity), 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 (see **Appendix 3**).

2.3.1.5 Hard Standing 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.

Detailed site layout drawings are available in **Appendix 3**.

2.3.1.6 Assembly Area

Levelled assembly areas will be located on either side of the hard-standing area as shown in **Appendix 3**. These assembly areas are required for offloading turbine blades or turbine blade segments, tower sections and hub from trucks until they are ready to be lifted into position by cranes and to assist the main crane during turbine assembly. The layout represents the full extent of the assembly areas but may be subject to optimisation according to the turbine supplier’s requirements.

2.3.1.7 Generating Capacity

Modern wind turbine generators currently have a typical generating capacity in the 4 to 7 MW range, with the generating capacity continuing to evolve upwards as technology improvements are achieved by the turbine manufacturers. The exact power rating of the installed turbine will be designed to match the wind regime on the Proposed Wind Farm and will be determined by the selected manufacturer.

Please note, the MW output of the Proposed Wind Farm is considered to be a consequence of turbine design and not a physical attribute on which it is possible to measure or assess the impact of. For the purposes of this EIAR, a rated output of 6MW has been chosen to calculate the potential generating capacity of the proposed 17-turbine renewable energy development, which would result in an estimated installed capacity of 102MW.

Assuming an installed capacity of 102MW, the Proposed Project therefore has the potential to produce up to 312,732 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 35%⁴ is applied here.

C = Rated output of the wind turbines: 102 MW

The 312,732 MWh of electricity produced by the Proposed Project would be sufficient to supply approximately 74,460 Irish households with electricity per year, based on the average Irish household using 4.2 MWh of electricity⁵ (this latest figure is available from the March 2017 CER Review of Typical Consumption Figures Decision Paper).

The 2022 Census of Ireland recorded a total of 26,855 occupied households in Co. Sligo. Per annum, based on a capacity factor of 35%, the Proposed Project would therefore produce sufficient electricity for the equivalent of over 100% of all households in Co. Sligo.

With regards to the modern turbine range, i.e., those available on the market at the time of writing, of 4 – 7MW, the resulting electricity produced would range from 208,488MWh to 364,854MWh per annum. The lower end of this range (208,488 MWh) would be sufficient to supply approximately 49,640 Irish households with electricity per year, based on the average Irish household using 4.2MWh of electricity. The higher end of this range (364,854MWh) would be sufficient to supply approximately 86,870 Irish households with electricity per year, based on the average Irish household using 4.2MWh of electricity. Based on the 2022 Census of Ireland results for Co. Sligo, the output range would produce sufficient electricity for the equivalent of over 100% of all households. .

2.3.1.8 Site Access Tracks

2.3.1.8.1 Access Track Construction Types

To provide access within the Proposed Wind Farm and to connect the Proposed Turbines and associated infrastructure, existing access tracks will be upgraded and new access tracks will be constructed. FTC were appointed to assess the existing ground conditions and specify the type of access track required to access all locations onsite. The access track construction design has taken into account the following key factors:

1. *Buildability considerations;*
2. *Making use of existing infrastructure where possible;*
3. *Minimising excavation arisings;*
4. *Serviceability requirements for construction and wind turbine delivery and maintenance vehicles;*
5. *Peat depths;*
6. *Horizontal longitudinal and cross fall gradient of the access tracks, and,*
7. *the requirement to minimise disruption to peat hydrology.*

⁴ Enduring Connection Policy 2.3 Solar and Wind Constraints Report: Assumptions and Methodology
<https://cms.eirgrid.ie/sites/default/files/publications/ECP-2.3-Solar-and-Wind-Constraints-Report-Assumptions-and-Methodology-v1.1.pdf>
⁵ March 2017 CER (CRU) Review of Typical Consumption Figures Decision Paper https://www.cru.ie/document_group/review-of-typical-consumption-figures-decision-paper/

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

A combination of both new and existing access tracks will make up the access track network within the Proposed Wind Farm site. The Proposed Wind Farm has been designed to utilise as much existing track as possible. Where existing access tracks and public road is to be used, only minor upgrade works are required. It is proposed to upgrade 8.9km of the Existing Wind Farm access tracks, 4.8km of existing public road corridor and to construct 4.6km of new access tracks on the Proposed Wind Farm. As can be seen on Figure 4-2, there are areas of the existing access track network for upgrade which will be wide enough to allow for construction vehicles to safely pass each other on the access tracks. Some of these areas were constructed as passing bays and formed through the widening of tracks to facilitate turbine delivery for the Existing Wind Farm.

The road construction techniques to be considered are as follows:

- Upgrade of Existing Access Tracks – Type A and B
- Construction of New Excavated Access Tracks through Peat – Type C
- Construction of New Floated Tracks over Peat – Type D

Upgrade of Existing Access Tracks – Type A and B

As noted above, 8.9km of existing access tracks within the Proposed Wind Farm and 4.8km of public road corridor along the L2702 and L6309 local roads will be upgraded as part of the Proposed Project construction phase. The existing access tracks were constructed using both floating and excavate and replace construction techniques. Upgrade works will involve both widening and resurfacing of the existing access tracks. The general construction methodology for upgrading of existing sections of access tracks, as presented in FTC's *Peat & Spoil Management Plan* in **Appendix 4**.

A cross section of Upgrade of Existing Access Tracks (Type A and B) is shown in **Appendix 4**.

A 970m section of the L2702 local road proposed to be upgraded is located adjacent to the boundary of the Ox Mountain Bog Special Area of Conservation (SAC). All proposed public road upgrade works along this boundary will be maintained to the opposite road verge to avoid overlap with the SAC.

Construction of New Excavated Access Tracks through Peat – Type C

As noted above, 4.6km of new access tracks will be constructed to facilitate the Proposed Wind Farm. Due to the ground conditions, specific sections of new access tracks proposed on site are proposed to be founded and located on competent stratum.

A section of a new excavated access track through peat (Type C) is shown in **Appendix 4**.

Construction of New Floated Tracks over Peat – Type D

The use of new floated access tracks will be limited on site to areas of flatter terrain, i.e. less than a 3-degree slope. Floating roads are not proposed on areas of significant sidelong ground (>5 degrees). The general construction methodology for the construction of floating access tracks over peat is summarised in **Appendix 4**.

A cross section of New Floated Track over Peat (Type D) is shown in **Appendix 4**.

2.3.1.9 Watercourse/ Culvert Crossings

The majority of the Proposed Wind Farm drains to the Dunneill River in the eastern section and the Easky River via the Buncrowey River in the western section. Several headwater streams rise along the western facing slopes of the Site and these streams flow south westerly towards the Lackavane River. These streams intercept some of the existing forestry access tracks and Proposed Wind Farm access tracks as described below. Several headwater streams of the Dunneill and Buncrowey Rivers flow off the steep western facing slopes through the Proposed Wind Farm.

There are a total of 19 no. watercourse crossings within the Proposed Wind Farm, of which 9 no. are referenced on EPA/OSI mapping, along existing tracks and public roads. 2 no. new crossings are proposed, along the temporary access track for turbine delivery at the L6309/L2702 junction and within the Existing Wind Farm approaching the existing Dunneill control building

Culvert Crossings

All proposed culvert upgrades crossings required for the Proposed Wind Farm will be suitably sized for the expected peak flows in the relevant drain.

Some culverts may be installed to manage drainage waters from works areas of the Proposed Project, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base. In all cases, culverts will be oversized to allow mammals to pass through the culverts. All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance.

2.3.1.10 Borrow Pits

It is estimated that approximately 299,700 cubic metres (m³) of stone material will be required to construct the Proposed Wind Farm. It is proposed to develop 3 no. borrow pits as part of the Proposed Project. The proposed borrow pits will provide the majority of all rock and hardcore material required during construction of the Proposed Project. Usable rock may also be won from other infrastructure construction, including the turbine base excavations. 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.

Access to the borrow pits will be via existing access roads running along the southern edge of each of the 3 no. borrow pits. 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 area 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. These two rock extraction methods are discussed below. 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. Appropriate health and safety signage will also be erected on this fencing and at locations around the fenced areas.

2.3.1.11 Onsite 110kV Substation

It is proposed to utilise the maximum export capacity from the Existing Grid Connection for the Proposed Project via connection to the Existing Wind Farm 2 no. onsite control buildings. To accommodate the remaining export capacity of the Proposed Project, the Proposed Wind Farm will connect via internal cabling to a proposed 110kV electricity substation within the Site as shown in **Appendix 3**. The proposed onsite 110kV substation is located at the northwest of the Proposed Wind Farm, in the townland of Crowagh or Dunneill Mountain, Co. Sligo. The construction and exact layout of electrical equipment in the onsite electricity substation will be to EirGrid Networks specifications. Access to the proposed onsite 110kV substation will be via a new site entrance along the L2702 local road. Upon decommissioning of the Proposed Wind Farm, the 110kV substation will remain *in situ* and form part of the national grid infrastructure.

The footprint of the proposed onsite 110kV substation compound measures approx. 14,340m² 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 via the Proposed Grid Connection Route connection to Srananagh 220kV substation.

The proposed onsite 110kV substation compound will include steel palisade fencing (approx. 2.4 metre high or as otherwise required by EirGrid), and internal fences will also segregate different areas within the main substation.

2.3.1.12 Internal Cabling

2.3.1.12.1 Site Underground Electrical (33kV) and Communications Cabling

Each of the Proposed Turbines will be connected to either the existing onsite control buildings or proposed onsite 110kV substation via underground 20 or 33kV (kilovolt) electricity cabling. Fibre-optic cables will also connect each of the Proposed Turbines to the onsite control buildings or proposed onsite 110kV substation. The electricity and fibre-optic cabling connecting to the onsite control buildings and proposed onsite 110kV substation compound will be run in cable ducts approx. 1.2 metres beneath ground level, along the sides of roadways or under the roadways. The route of the cable ducts 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 ducting may vary within the cabling trench. The exact configuration of the underground cabling will be set by the requirements of the electrical designers at detailed design stage.

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 Site should sufficient volumes of suitable material not be encountered onsite.

2.3.1.12.2 Connection into Existing Wind Farm Control Buildings

There are currently 2 no. control buildings within the Existing Wind Farm. Of the proposed 102 MW that will be generated by the Proposed Project, it is intended to utilise the Existing Wind Farm onsite control buildings and Existing Grid Connection to Cunnihill 110kV substation in order to connect c.36.1 MW from the Proposed Project to the national grid.

No internal upgrades to both existing control buildings are required. The only proposed works at the existing control building comprise the connection of the 33kV electrical cabling from the Proposed Turbines. There will be no further alterations to the existing control buildings onsite as part of the Proposed Project.

2.3.1.13 Temporary Construction Compounds

There are 4 no. temporary construction compounds proposed as part of the Proposed Project. 2 no. of these temporary construction compounds are located on areas of existing hardstanding which will be upgraded and extended in order to accommodate the compounds. A summary of the temporary construction compounds are provided in Table 2-2 below:

Table 2-2. Temporary Construction Compounds.

Temporary Construction Compound	Location (approx.)	Located on Existing Hardstanding	Area (m2)
1	160m east of T05	No	1,800
2	660m northwest of T06	No	1,800
3	360m north of T08	Yes	1,800
4	325m west of T14	Yes	1,800

The layout of a temporary construction compound is shown in **Appendix 3**.

The temporary construction compounds will consist of a bunded refuelling and containment area for the storage of lubricants, oils and site generators, etc, and full retention oil interceptor, waste storage area, welfare facilities including temporary site offices, staff facilities and car parking areas for staff and visitors. Temporary port-a-loo toilets and toilets located within a staff portacabin will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered offsite by a permitted waste collector to wastewater treatment plant. There will also be a water supply onsite for hygiene purposes, by way of a temporary storage tank.

Upon completion of the construction phase, the temporary construction compounds will be removed as part of the post-construction reinstatement works of the Proposed Wind Farm. The concrete foundations of the compound will be left in situ and will be left to revegetate naturally.

The temporary construction compounds will facilitate the temporary storage of some general construction materials, however, turbine components will be brought directly to the proposed turbine locations following their delivery to the Proposed Wind Farm site.

2.3.1.14 Onsite LiDAR Compounds

2 no. LiDAR compounds are proposed as part of the Proposed Project. One LiDAR compound will be installed approx. 380m west of T05 along an existing access road and the other approx. 110m southwest of T16 on an area of existing hardstanding upon which an existing turbine (which is proposed to be removed as part of the Proposed Project) is situated. These hardstandings will be 17.5m² in area each and are sufficiently large enough to accommodate the equipment that will be used to install the LiDAR compounds. The proposed LiDAR compounds will be equipped with wind monitoring equipment, uninterrupted power supply and interface panel with palisade fencing. will be constructed. Details of the proposed LiDAR compound is shown in **Appendix 3**.

2.3.1.15 Biodiversity Management and Enhancement Plan

A Biodiversity Management and Enhancement Plan (BMEP) has been prepared for the Proposed Project and is included as **Appendix 7** of this report. The BMEP demonstrates the offsetting obligations for (1) for any potential impacts on biodiversity and (2) compliance with the offsetting requirements for total habitat loss following the Biodiversity Net Gain (BNG) policy under the current Sligo County Development Plan by enhancing higher value habitat to offset the loss of lower value habitat.

The BMEP has set out measures to be implemented to establish an enhanced baseline and management manage the area to ensure that the measures are successful, as well as regularly monitoring by an ecologist to ensure the success of the habitat restoration measures.

An area of approximately 36ha is proposed for habitat enhancement through restoration works to prevent and revert erosion, safeguarding and the implementation of a grazing management regime. It is located in the centre of the Proposed Wind Farm; however, it is not bordering any associated proposed infrastructure. The management area shares a boundary with the Ox Mountains Bogs SAC in the southeast of approximately 220m and a winding boundary in the west of approximately 1500m.

Additionally, the area of cutover bog in the vicinity of Proposed Turbines T2-T4 and T1-T3 is proposed to be used for peat and spoil storage and management. The area consists of a network of cutover cells with varying degrees of peat depth (30 cm-150cm) and vegetation cover with areas of bare peat, recolonising peat with hare's tail cotton-grass (*Eriophorum vaginatum*) and areas of long leggy ling heather (*Calluna vulgaris*). This area will, where possible, be restored to active peatland habitat. This will cover an area of approximately 5.45ha.

2.3.1.16 Tree Felling and Replanting

Tree felling will be required within and around Proposed Wind Farm infrastructure footprint to allow for the construction of 9 no. Proposed Turbine bases, access tracks, underground cabling, and the other ancillary infrastructure. 29.3ha of conifer plantation will be felled to accommodate the Proposed Wind Farm construction and operation.

2.3.1.16.1 Forestry Replanting

In line with the Forest Service's published policy on granting felling licences for wind farm developments, areas cleared of commercial 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 identified 29.3 ha of commercial forestry that will be permanently felled for the Proposed Wind Farm 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 Wind Farm. 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 29.3ha of forestry felled as part of the Proposed Wind Farm may occur on any lands, within the State benefitting from Forest Service Technical Approval⁶ for afforestation, should the Proposed Wind Farm receive planning permission.

For the balance of the replanting obligation, the Applicant commits to replanting 29.3 ha of forestry outside the hydrological catchment within which the Proposed Project is located. On this basis, it is reasonable to conclude that there will be no cumulative effects associated with the replanting of 29.3 ha of forestry. Therefore, the 29.3 ha of forestry replanting is not considered further in the impact

⁶ All proposed forestry developments where the area involved is greater than 0.1 hectare must receive the prior written approval of the Forest Service. The application for approval is known as Pre-Planting Approval – Form 1.

assessment chapters of this EIAR. In addition, the Applicant commits to not commencing the Proposed Project until both a felling and afforestation licence(s) is in place and, therefore, this ensures the afforested lands are identified, assessed and licenced appropriately by the relevant consenting authority.

2.3.2 Proposed Grid Connection Route

2.3.2.1 Underground 110kV Electrical Cabling

It is intended to connect the onsite 110kV substation to the existing Srananagh 220kV substation in the townland of Ballysumaghan, Co. Sligo via 110kV underground electrical cabling. The exact connection node is to be confirmed by EirGrid and subject to change at their request. The underground electrical cabling route, illustrated in Appendix 4-8 of the accompanying EIAR is approx. 41.6km in length and located primarily within the public road corridor, with approx. 130m located within the Proposed Wind Farm.

The Proposed Grid Connection Route will originate at the proposed onsite 110kV substation and run west for approx. 130m through proposed new site roads before turning north for 400m along the L2702 Local Road. The Proposed Grid Connection Route will continue east and then north along the L6309 Local Road network for approx. 6.6km. The Proposed Grid Connection Route then follows the N59 National Road east for 26.2km before continuing southeast for 6.9km on the R290 Regional Road. The Proposed Grid Connection Route then joins the R284 Regional Road heading southeast for 2.8km on the L6234 Local Road before heading east onto the L5204 Local Road for 1.8km. From the L5204 the Proposed Grid Connection Route turns left and travels a final 400m into the existing Srananagh 220kV substation.

The Proposed Grid Connection Route underground cabling trench will consist of 3 no. 160mm diameter HDPE power cable ducts, 2 no. 125mm diameter HDPE communications ducts and 1 no. 125mm diameter earth continuity conductor duct to be installed in an excavated trench, typically 825mm wide by 1315mm deep, with variations on this design to adapt to service crossings and watercourse crossings. The power cable ducts will accommodate 1 No. power cable per duct. The communications duct will accommodate a fibre cable to allow communications between the proposed onsite 110kV substation and Srananagh 220kV substation.

2.3.2.2 Joint Bays

Joint Bays are to be provided approximately every 620m to 680m along the Proposed Grid Connection Route to facilitate the jointing of 2 no. lengths of underground electrical cabling. 110kV Joint Bays are typically 2.5m x 6m x 2.05m pre-cast concrete structures installed below finished ground level. Joint Bays will be located in the non-wheel bearing strip of roadways where possible.

In association with Joint Bays, Communication Chambers are required at every joint bay location to facilitate communication links between Wind Farm and the existing Substation. Earth sheath links are used for earthing and bonding cable sheaths of underground power cables, installed in a trefoil formation so that the circulating currents and induced voltages are eliminated or reduced. Earth sheath link chambers and communication chambers are located close to joint bays. Earth sheath link chambers and communication chambers will typically be pre-cast concrete structures with an access cover at the finished surface level.

The precise siting of all joint bays, earth sheath link chambers, and communication chambers is subject to approval by EirGrid. Marker posts will be used on non-roadway routes to delineate the duct route and joint bay positions. The marker posts will consist of a corrosion-proof aluminium triangular danger sign, with a 750mm base, and with a centred lightning symbol, on engineering grade fluorescent yellow background. They will be installed inadequately sized concrete foundations and will also be placed where the cable has not been buried to the standard depth, due to existing road conditions. Drawings of the joint bays and communication chambers are included within this planning package. The precise

siting of all Joint Bays, Earth Sheath Link Chambers and Communication Chambers, within the curtilage of the public road, is subject to approval by ESBN and EirGrid.

2.3.2.3 Watercourse/ Built Service Crossings

There are 34 no. identified watercourse crossings along the Proposed Grid Connection Route, 31 no. of which are referenced on EPA/OSI mapping. The construction methodology for the 34 no. identified watercourse crossings has been designed to eliminate the requirement for in-stream works on these locations requiring a crossing to be constructed to traverse the watercourse with the cabling ducts. There are also 2 no. built service crossings of a 38kV underground cable and a disused historic railway line.

Where the Proposed Grid Connection Route intersects with existing watercourses, a detailed construction method statement will be prepared by the Contractor prior to the commencement of construction and is to be approved by the Local Authority and relevant environmental agencies. Existing culverts will be crossed using open trenching with either an undercrossing or an overcrossing, depending on the depth of the culvert.

Inland Fisheries Ireland have published guidelines relating to construction works along water bodies entitled '*Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*' (IFI, 2016), and these guidelines will be adhered to during the construction of the Proposed Project.

A general description of the various construction methods employed at watercourse crossings are described in the following paragraphs below. An illustration of the proposed crossing methodologies are included in Chapter 4 of the accompanying EIAR. Table 2-4 below outlines the proposed methodology for each watercourse crossing along the Proposed Grid Connection Route.

Should an alternative methodology option be required for individual crossings during the construction process this will be agreed with the relevant authorities including Sligo County Council prior to works commencing.

Where culverts require upgrading, the Applicant will commission a survey of culverts, the results of which will inform the exact details of the upgrade works which will be forwarded to the relevant Local Authority. Having regard to the duration of the consent requested (10 years) it is considered best practice that any such surveys be carried out prior to construction to facilitate accuracy and timely reporting of the surveys.

2.3.2.3.1 Standard Formation Crossing over Culvert – Option A

Where adequate cover exists above a culvert or service, the standard aforementioned trench arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or water course. The cable trench will pass over the culvert in a standard trench.

Where no crossing currently exists, the cable will pass over the watercourse in a bottomless box culvert or pre-cast concrete slab in a standard trefoil arrangement. Where required existing culvert crossings will be extended using appropriately sized corripipes.

2.3.2.3.2 Standard Formation Crossing under Culvert – Option B

Where the culvert or service crossing consists of a socketed concrete or sealed plastic pipe and sufficient depth is not available over the crossing, a trench will be excavated beneath the culvert and cable ducts will be installed in the standard formation 300mm below the existing pipe.

2.3.2.3.3 Horizontal Directional Drilling – Option C

In the event that none of the above methods are appropriate, horizontal directional drilling (HDD) will be utilised. The Proposed Grid Connection Route will involve 15 No. bridge crossings including 15 No. HDD crossings. Drawings of all 15 no. bridge crossings are included in Appendix 4-8 of the accompanying EIAR.

HDD is a method of drilling under obstacles such as bridges, culverts, railways, water courses, etc. in order to install cable ducts under the obstacle. This method is employed where installing the ducts using standard installation methods is not possible.

The HDD method of duct installation will be carried out using Vermeer D36 x 50 Directional Drill (approx. 22 tonnes), or similar plant, for the directional drilling at watercourse/culvert crossings listed in Table 2-4 . The launch and reception pits will be approx. 0.55m wide, 2.5m long and 1.5m deep. The pits will be excavated with a suitably sized excavator. The drilling rig will be securely anchored to the ground by means of anchor pins which will be attached to the front of the machine. The drill head will then be secured to the first drill rod and the operator shall commence to drill into the launch pit to a suitable angle which will enable him to obtain the depths and pitch required to the line and level of the required profile. Drilling of the pilot bore shall continue with the addition of 3.0m long drill rods, mechanically loaded and connected into position.

During the drilling process, a mixture of a natural, inert and fully biodegradable drilling fluid such as Clear Bore™ and water is pumped through the centre of the drill rods to the reamer head and is forced in to void and enables the annulus which has been created to support the surrounding subsoil and thus prevent collapse of the reamed length. Depending on the prevalent ground conditions, it may be necessary to repeat the drilling process by incrementally increasing the size of the reamers. When the reamer enters the launch pit, it is removed from the drill rods which are then passed back up the bore to the reception pit and the next size reamer is attached to the drill rods and the process is repeated until the required bore with the allowable tolerance is achieved.

The use of a natural, inert and biodegradable drilling fluid such as Clear Bore™ is intended to negate any adverse impacts arising from the use of other, traditional polymer-based drilling fluids and will be used sparingly as part of the drilling operations. It will be appropriately stored prior to use and deployed in the required amounts to avoid surplus. Should any excess drilling fluid accumulate in the reception or drilling pits, it will be contained and removed from the Site in the same manner as other subsoil materials associated with the drilling process to a licensed recovery facility.

Backfilling of launch & reception pits will be conducted in accordance with the normal specification for backfilling excavated trenches. Sufficient controls and monitoring will be put in place during drilling to prevent frack-out, such as the installation of casing at entry points where reduced cover and bearing pressure exists.

Table 2.3 Proposed Grid Connection Route Watercourse crossing types

No.	XITM	YITM	EPA Mapped Watercourse	Watercourse Crossing Type	Width of Crossing (m)	Cover from Road Level to Top of Culvert (m)	Crossing Methodology	Extent of In-Stream Works
1	572355	825627	Y	Stone Arch Bridge	2.4	0.48	HDD (Option C)	No in-stream works required
2	571336	826414	Y	Stone Culvert	2	1.4	Under (Option B)	No in-stream works required
3	571212	826505	Y	Plastic Pipe	N/A	N/A	Under (Option B)	No in-stream works required
4	571044	826702	Y	Concrete Pipe	N/A	N/A	Under (Option B)	No in-stream works required
5	570965	826798	Y	Stone Arch Bridge	2.4	1.16	HDD (Option C)	No in-stream works required
6	570805	826879	Y	Stone Arch Bridge	2.4	1.2	HDD (Option C)	No in-stream works required
7	569919	826457	Y	Concrete Pipe	0.5	0.5	Under (Option B)	No in-stream works required
8	569426	825945	Y	Stone Arch Bridge	8.7	0.6	HDD (Option C)	No in-stream works required
9	567921	826576	Y	Stone Arch Bridge	8	0.39	HDD (Option C)	No in-stream works required
10	567205	828481	Y	Stone Culvert	0.6	1.1	Under (Option B)	No in-stream works required
11	567133	828610	N	Stone Arch Bridge	0.9	0.75	HDD (Option C)	No in-stream works required
12	562971	828380	Y	Plastic Pipe	0.4	0.6	HDD (Option C)	No in-stream works required
13	562221	828218	Y	Concrete Pipe	N/A	N/A	Under (Option C)	No in-stream works required
14	561746	828327	Y	Stone Arch Bridge	1.15	1.5	Under (Option B)	No in-stream works required
15	561038	828915	Y	Concrete Pipe	0.5	0.5	Under (Option B)	No in-stream works required
16	560407	829488	Y	Stone Culvert	2.5	0.9	Under (Option B)	No in-stream works required
17	559751	830009	Y	Plastic Pipe	1.5	2.8	Over (Option A)	No in-stream works required
18	557774	831372	Y	Concrete Pipe	0.5	0.5	Under (Option B)	No in-stream works required
19	557108	831713	Y	Stone Culvert	N/A	N/A	Under (Option B)	No in-stream works required
20	554284	832997	Y	Stone Arch Bridge	4	0.63	HDD (Option C)	No in-stream works required
21	556058	832266	Y	Stone Arch Bridge	4	0.95	HDD (Option C)	No in-stream works required
22	553713	833112	Y	Stone Arch Bridge	4.5	1.39	HDD (Option C)	No in-stream works required
23	550769	832497	Y	Stone Arch Bridge	7	1.38	HDD (Option C)	No in-stream works required
24	548687	832623	Y	Stone Arch Bridge	1.25	1.5	Under (Option B)	No in-stream works required
25	546319	833109	Y	Stone Arch Bridge	11	0.69	HDD (Option C)	No in-stream works required
26	545896	832338	Y	Stone Culvert	0.6	0.4	Under (Option B)	No in-stream works required
27	545851	832027	Y	Concrete Pipe	N/A	N/A	Under (Option B)	No in-stream works required

No.	XITM	YITM	EPA Mapped Watercourse	Watercourse Crossing Type	Width of Crossing (m)	Cover from Road Level to Top of Culvert (m)	Crossing Methodology	Extent of In-Stream Works
28	545698	831533	N	Stone Arch Bridge	N/A	N/A	HDD (Option C)	No in-stream works required
29	545721	831106	Y	Stone Culvert	N/A	N/A	Under (Option B)	No in-stream works required
30	545819	830506	N	Stone Culvert	0.3	0.6	Under (Option B)	No in-stream works required
31	545952	829639	Y	Stone Arch Bridge	2	0.35	HDD (Option C)	No in-stream works required
32	544996	829388	Y	Concrete Pipe	N/A	N/A	Under (Option B)	No in-stream works required
33	544460	829246	Y	Stone Arch Bridge	8	0.78	HDD (Option C)	No in-stream works required
34	543837	829195	Y	Concrete Pipe	0.5	0.5	Under (Option B)	No in-stream works required
35	543436	829158	N	Concrete Pipe	0.6	1.8	Under (Option B)	No in-stream works required
36	568427	826080	N/A	Service Crossing	N/A	N/A	HDD (Option C)	N/A

2.3.3 Turbine Component Transport Route

Wind Farm components will be delivered to the Site from Killybegs Port. Vehicles delivering large turbine components and other abnormal loads to the site will depart from Killybegs Port and travel east on the N56 towards Donegal, further south along the N15 towards Sligo before continuing south on N4 through Ballysadare, and subsequently merging onto the N59 heading west towards Dromore West. Delivery vehicles will then head south on the L2702 before turning east towards the site entrance in the townland of Crowagh or Dunneill Mountain, along the L6309.

2.3.4 Proposed Biodiversity Enhancement Area

An area of approximately 36ha is proposed for habitat enhancement. It is located in the centre of the Proposed Wind Farm; however, it is not bordering any associated proposed infrastructure. The management area shares a boundary with the Ox Mountains Bogs SAC in the southeast of approximately 220m and a winding boundary in the west of approximately 1500m. The Site slopes steeply down towards the Dunneill_010 river along its eastern boundary. The slope towards the Dunneill_101 river supports areas of dense bracken, peat depths on the slope are between 0cm and 50cm.

Details of the proposed enhancement measures are provided in the **BMEP (Appendix 7)**.

3. CHARACTERISTICS OF THE RECEIVING ENVIRONMENT

3.1 Desk Study

3.1.1 Hydrological Desk Study

The Hydrology Chapter (Chapter 9) of the EIAR associated with this planning application was consulted (as summarised below) to inform the assessment within this report. Regional and Local Hydrology

Regionally, the Site is located in the WFD Sligo Bay surface water catchment within Hydrometric Area No. 35 of the North Western River Basin District.

On a more local scale the Proposed Wind Farm is located in 2 no. sub catchments; namely the Easky_SC_010 and the Dunmoran_SC_010. Within the Easky_SC_010 the Proposed Wind Farm drains to the Easky River (Easky_010) and the Buncrowney River (Buncrowney_010). The Buncrowney River is a tributary of the Easky River.

With the Dunmoran_SC_010, the Proposed Wind Farm drains to the Dunneill River (Dunneill_010), Doonbeakin River (Doonbeakin_010) and Lugdoon Stream (Lugdoon_010). Refer to Table 3-1 below which summarises the Proposed Wind Farm infrastructure within each sub-basin.

All the above-mentioned river waterbodies drain into Sligo Bay to the north which is approximately 6km downstream of the Proposed Wind Farm at its closest point.

On leaving the proposed 110kV substation on the west of the Proposed Wind Farm, the Proposed Grid Connection Route passes through the Easky_SC_010 (1.6km), Dunmoran_SC_010 (26.5km), Owenmore[Sligo]_SC_040 (5.5km) and Owenmore[Sligo]_SC_030 (7.8km). Local drainage along the Proposed Grid Connection Route on a sub-basin scale is summarised in Table 3-1 below.

The turbine delivery route (TDR) works, which are located along local road L2702 to the northwest of the Proposed Wind Farm, are located in the Easky_SC_010 sub-catchment and locally within the Carrownrush_010 sub-basin (Ballymeeny River) which drains into Sligo Bay to the north.

The proposed Biodiversity Management and Enhancement Plan (BMEP) lands, situated centrally within the Proposed Wind Farm, are located within the Easky_SC_010 and Dunmoran_SC_010 where they drain to the Buncrowney River (Buncrowney_010) and Dunneill River (Dunneill_010) respectively.

The existing 23 no. turbines from the Existing Wind Farm are located in the Dunmoran_SC_010 and drain to the Dunneill River (Dunneill_010 and Doonbeakin_010 sub-basins).

Table 3-1 Proposed Infrastructure in each WFD Sub-basin Table 3-1

WFD Sub-catchment	WFD Sub-basin	Proposed Project
Proposed Wind Farm		
Easky_SC_010	Easky_020	1 no. Proposed Turbine & 1 no. temporary construction compound
	Easky_030	2 no. Proposed Turbines & 2 no. peat/spoil management areas
	Buncrowney_010	3 no. Proposed Turbines, 3 no. peat/spoil management areas, 110kV substation and BMEP lands
	Carrownrush_010	TDR works on L2702 local road
Dunmorán_SC_010	Dunneill_010	20 no. Existing Wind Farm turbines for removal. 9 no. Proposed Turbines, 4 no. peat/spoil management areas, 3 no. borrow pits, 1 no. temporary construction compound, decommissioned turbine lay down areas and BMEP lands
	Doonbeakin_010	3 no. Existing Wind Farm turbines for removal. Proposed 1 no. peat/spoil management areas
	Lugdoon Stream_010	2 no. Proposed Turbines & 2 no. peat/spoil management areas
Proposed Grid Connection Route		
Easky_SC_010	Buncrowney_010	1.6km (1 no. EPA Watercourse (WC))
Dunmorán_SC_010	Dunneill_010	0.76km (1 no. EPA WC)
	Doonbeakin_010	4km (4 no. EPA WC)
	Dunneill_020	0.2km (1 no. EPA WC)
	Lugdoon Stream_010	1.03km (1 no. EPA WC)
	Kilrusheighter_010	3.76km (3 no. EPA WC)
	Doonflin_010	1.3km (1 no. EPA WC)
	Dunmorán_010	4.2km (2 no. EPA WC)
	Barnabrack_010	11.3km (9 no. EPA WC)
Owenmore(Sligo)_SC_040	Ballysodare_010	4km (1 no. EPA WC)
	Owenmore(Sligo)_080	1.5km (1 no. EPA WC)
Owenmore(Sligo)_SC_030	Unshin_050	3.9km (7 no. EPA WC)
	Unshin_040	3.9km (1 no. EPA WC)

3.1.1.1 Hydrogeology

The Proposed Wind Farm is largely located within the Collooney Groundwater Body (GWB) (IE_WE_G_0048) which has a mapped surface area of 231.8km². A small portion on the west of the Proposed Wind Farm extends into the Easky East Groundwater Body (IE_WE_G_0050), which has a mapped surface area of 94.3km². The Collooney GWB is classified as ‘poorly productive bedrock’ while the Easky East GWB is classified as karstic.

The bedrock type of the Collooney GWB is predominantly Precambrian Quartzites, Gneisses & Schists which are also mapped to underlie the Proposed Wind Farm. This bedrock unit is classified by the GSI as a Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones (PI).

Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. Generally, water levels are 0-10 m below ground level. Flow paths are likely to be up to 300m, with groundwater discharging rapidly to nearby streams and small springs. There are observed deep water strikes, indicating that there is a component of deep groundwater flow, however shallow groundwater flow is dominant. Groundwater flow directions are expected to follow topography (GSI, 2004).

Diffuse recharge occurs in this GWB via rainfall percolating through the subsoil and rock outcrops. Due to the low permeability of much of the subsoil (blanket peat), a high proportion of the available recharge will discharge into the streams. In addition, the steep slopes in the mountainous areas promote surface runoff. The stream density is high, indicating the high proportion of surface runoff (GSI, 2004).

The bedrock type of the Easky East GWB is predominantly Dinantian Pure Bedded Limestones and Dinantian Upper Impure Limestones, which also underlies the northwestern portion of the Proposed Wind Farm. The Glencar Limestone Formation and the Ballina Limestone Formation (Upper) which underlie the northwestern area of the Proposed Wind Farm are comprised of dark fine limestone and calcareous shale, and grey limestone and thin shale respectively. The GSI has classified the Glencar Limestone Formation as a Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones (LI), while the Ballina Limestone Formation (Upper) has been classified as Regionally Important Aquifer – Karstified (RK).

These rocks are generally devoid of intergranular permeability. Groundwater flows through fissures, faults, joints and bedding planes. In pure bedded limestones these openings are enlarged by karstification which significantly enhances the permeability of the rock. Two sub-types of karst aquifers are recognised, termed Rkc and Rkd. The data are not adequate to determine which sub-type it belongs to.

As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours. Flow velocities can be rapid and variable, both spatially and temporally. Rapid groundwater flow velocities indicate that a large proportion of groundwater flow takes place in enlarged conduit systems. Flow path lengths can be up to a several kilometres in length. Overall groundwater flow will be towards the rivers and lakes, but the highly karstified nature of the bedrock means that locally, groundwater flow directions can be highly variable (GSI, 2004).

Both point recharge and diffuse recharge occur in this GWB. Diffuse recharge occurs over the GWB via rainfall percolating through the permeable subsoil and rock outcrops in areas of blanket peat and low permeability till [such as the Proposed Wind Farm], a high proportion of the available recharge will discharge to the streams. The main discharges are to the small springs, streams, rivers and lakes. The stream density is relatively high, particularly for an area dominated by pure limestones (GSI, 2004).

According to the GSI karst database there are no karst features mapped with 5km of the Proposed Wind Farm.

The Proposed Grid Connection Route is also located within the Collooney GWB along with the Beltra-Sligo GWS (IE_WE_G_0043), Carrowmore West (IE_WE_G_0040) and Ballygawley GWB (IE_WE_G_0039) which are all classified as karstic. The eastern end of the Proposed Grid Connection Route is located in the Lavagh-Ballintougher GWB (IE_WE_G_0038) which is classified as ‘poorly productive bedrock’

3.2 Details of NPWS Meeting

The outcome of the meeting with the National Parks and Wildlife Service (NPWS) on the 10th of February 2026 to discuss the Proposed Project as detailed in Section 1.4.2.1 included the following feedback and recommendations from the NPWS:

- The Screening for Designated Sites assessed as part of this NIS was discussed with the NPWS.
- The classification of peatland habitats was discussed, and it was highlighted that IVC classification should be used not only for areas of direct habitat loss, but also for surrounding areas to assess the impact of habitat loss within the wider area. Peatland assessment and classification should follow the National Survey of Upland Habitats (NSUH) Guidance⁷ but use IVC classifications. The assessment should demonstrate use of the mitigation hierarchy in site design and layout. A detailed description of the Methodology used, and the baseline survey results is provided in **Section 1.2.3.1..**
- The NatureScot guidance⁸ should be used to determine the status of peatland habitats within the proposed Enhancement Areas, acknowledging that it can only be imperfectly applied to Irish habitat mapping. NSUH assessment should be used to assess the habitat condition. Publicly available habitat data should also be incorporated into the assessment and larger, continuous areas of blanket bog are considered more ecologically significant than isolated habitat blocks. These assessments should be used to inform the appropriate restoration measures. A detailed baseline of the habitats found in the habitat management area and its connection to the wider landscape is provided in the **BMEP Appendix 7.**
- The proposed BMEP should be detailed and prepared by an ecologist, with provisions for long-term management, mechanisms for adaptive management and detailed monitoring at set intervals following NSUH condition assessment methodologies and interim monitoring following less detailed assessments such as the acres score cards. Details of the Monitoring Plan including timelines and success measures are provided in the **BMEP Appendix 7.**
- The area to the southeast of the proposed Enhancement Area is a state-owned part of the Ox Mountains Bogs SAC and also designated as a Nature Reserve and Ramsar Site and needs to be discussed in the NIS. The impact of the Proposed Project on Designated Sites has been assessed within this **Natura Impact Statement (NIS).**

⁷ Perrin, P.M., Barron, S.J., Roche, J.R. & O’Hanrahan, B. (2014). *Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland. Version 2.0. Irish Wildlife Manuals, No. 79.* NPWS. Available at <https://www.npws.ie/sites/default/files/publications/pdf/TWM79.pdf>

⁸ <https://www.nature.scot/doc/peatland-action-technical-compendum>

3.3 Results of Baseline Ecological Surveys

3.3.1 Habitat Surveys

3.3.1.1 Habitats Recorded Within the Proposed Wind Farm

3.3.1.1.1 Conifer Plantation (WD4)/ Recently Felled Woodland (WS5)

Conifer Plantations (WD4) were recorded in the centre, north and east of the Proposed Wind Farm (**Plate 6-1**). Turbine 6, Turbine 7, Turbine 8, Turbine 9, Turbine 10, Turbine 11, Turbine 13, Turbine 17 and associated infrastructure (hardstands, access roads) are located within Conifer Plantation (WD4). Further, one borrow pit, substation, and one temporary construction compound are located within Conifer Plantation (WD4).

These conifer plantations are dominated by dense, mature Sitka spruce (*Picea sitchensis*) and Lodgepole pine (*Pinus contorta*). Other species recorded include ling heather (*Calluna vulgaris*), purple moor grass (*Molinia caerulea*), bilberry (*Vaccinium myrtillus*), male fern (*Dryopteris filix-mas*), Common bryophyte species recorded within the Conifer Plantations include *Polytrichum commune*, *Pleurozium schreberi*, *Hypnum jutlandicum*, and *Thuidium tamariscinum*. Ground conditions varied, with drier grounds covered in needles recorded on higher grounds (upper slopes), and wet ground dominated by carpets of bryophytes and *Sphagnum* recorded on lower grounds (base of slopes).

Large areas of **Recently Felled Woodland (WS5)** were recorded in the south of the Proposed Wind Farm. Species recorded include Sitka spruce saplings, tormentil (*Potentilla erecta*), soft rush (*Juncus effusus*), jointed rush (*Juncus articulatus*), purple moor grass, ling heather, fox glove (*Digitalis purpurea*), gorse (*Ulex europaeus*), bramble (*Rubus fruticosus agg.*) and *Polytrichum commune* (Plate 3-2).

No Proposed Wind Farm infrastructure is proposed for these areas of clear fell.



Plate 3-1. **Conifer plantation (WD4)** located throughout the Proposed Wind Farm.



Plate 3-2. Area of **Recently Felled Woodland (WS5)** recorded in the centre of the Proposed Wind Farm.

3.3.1.1.2 **Peatland Habitats**

Cutover Bog (PB4)

Areas of **Cutover Bog (PB4)** were recorded in the west and east of the Proposed Wind Farm. Active turbary with on-going turf cutting was recorded (**Plate 3-3**) to the west of the Site. As a result of the intensive turf cutting and drainage, the cutover bog is extremely degraded in places, with exposed bare peat and no vegetation cover recorded (**Plate 3-3**). Other areas of former cutover bog are revegetated with species such as common cottongrass (*Eriophorum angustifolium*) and ling heather (*Calluna vulgaris*) (**Plate 3-4**). Turbine 1, Turbine 2, Turbine 3, Turbine 4, Turbine 5 and Turbine 12 and the Temporary Construction Compound east of T5 are located on Cutover Bog (PB4) to the west of the Proposed Wind Farm. The areas around T1 and T2 corresponded most closely to the IVC heath classifications HE4E (*Molinia caerulea* – *Calluna vulgaris* – *Erica tetralix* heath) and HE2C (*Calluna vulgaris* – *Agrostis capillaris* heath), T3 and T5 corresponded to BG2C (*Erica tetralix* – *Molinia caerulea* – *Cladonia portentosa* peatland) and T4 to BG2B (*Erica tetralix* – *Andromeda polifolia* bog), T15 corresponded to BG2E (*Calluna vulgaris* – *Eriophorum* spp. Bog).

Evidence of previous turbary activity, exposed peat, drainage, and grazing was recorded throughout these habitats, which has resulted in the extreme degradation of this habitat. Species recorded include deer grass (*Trichophorum germanicum*), bog asphodel (*Narthecium ossifragum*), purple moor grass (*Molinia caerulea*), cross leaved heath (*Erica tetralix*), tormentil (*Potentilla erecta*), common cotton grass (*Eriophorum angustifolium*), ling Heather (*Calluna vulgaris*) and pixie-cup Lichen (*Cladonia pyxidate*).



Plate 3-3. Degraded **Cutover Bog (PB4)** to the west of the Proposed Wind Farm.



Plate 3-4. Degraded, revegetated **Cutover Bog (PB4)** recorded in the west of the Proposed Wind Farm.

Upland Blanket Bog (PB2)

Upland Blanket Bog (PB2) was recorded within the Proposed Wind Farm site. The altitudinal division between upland blanket bog (PB2) and lowland blanket bog (PB3) in Fossitt (2000) is the 150m contour, but this is only an approximate guide. Perrin *et al* (2014) states ‘, *areas of bogs should be classified primarily on the basis of the vegetation rather than altitude*’. As such, due to the presence and cover of heathers (*Calluna vulgaris*, *Erica tetralix*), and the absence of Black bog rush (*Schoenus nigricans*), these areas are classified as **Upland Blanket Bog (PB2)** as per Fossitt 2000. These areas correspond to the Annex I habitat ‘*Blanket Bogs (* if active bog) (7130)*’. While a level of modification in form of drainage, historic peat cutting or grazing was recorded in all areas of recorded as upland blanket bog, these areas remain active with the presence of peat forming Sphagnum species. Particularly the Proposed Enhancement Area in the centre of the Proposed Wind Farm site supports areas of blanket bog vegetation on deep peat with intact hydrology. Species in this area include *Calluna vulgaris*, *Eriophorum angustifolium*, *Molinia caerulea* and *Narthecium ossifragum*, as well as *Sphagnum papillosum*, *Sphagnum capillifolium*, *Sphagnum austinii* and *Sphagnum medium*. Several shallow artificial drains (around 40cm) were recorded throughout the Proposed Enhancement Area, and over grazing was particularly evident in the southern section of the Proposed Enhancement Area with locally up to 60% bare peat.

Pockets of Upland Blanket Bog (PB2) were recorded throughout the Site in openings within conifer plantations, where the wet ground conditions prevented conifers from establishing (Plate 3-5). Further areas of Upland Blanket Bog were recorded to the east and west of the Site in areas where no peat cutting has been undertaken (Plate 3-6). In the west of the Site, uncut but drained areas of Upland Blanket Bog exist adjacent to cutover areas.

No Proposed Wind Farm infrastructure is proposed on areas of intact Upland Blanket Bog. However, a borrow pit required as part of the Proposed Project is located within marginal blanket bog habitat adjacent to an existing access road.



Plate 3-5 Area of intact **upland blanket bog (PB2)** to the centre of the site, recorded within an opening in Conifer Plantation.



Plate 3-6. Overview of **Upland Blanket Bog (PB2)** to the west of the Site.

Eroding Blanket Bog (PB5)

Eroding Blanket Bog (PB5) was recorded within the Proposed Enhancement Area in the Proposed Wind Farm site. The area shows sign of overgrazing with areas of up to 60% bare peat. Numerous sheep tracks were recorded to show signs of erosion, with some erosion channels being up to 30cm deep. Surface erosion due to surface water flow downstream was evident during the Site visit and is shown on Plate 3-7. Species recorded in this area included small stands of *Eriophorum angustifolium*, *Trichophorum caespitosum* and *Calluna vulgaris*. Sphagnum species were absent in the eroded areas.



Plate 3-7 Eroding blanket bog (PB5)

Wet heath (HH3)

Wet heath (HH3) was recorded within the Existing Dunneill Wind Farm. The area supporting this habitat forms part of the Ox Mountains Bogs SAC and is dominated by *Molinia caerulea*, with stands of *Calluna vulgaris* and moss species including *Hylocomium splendens* and *Sphagnum capillifolium*. The area is grazed by sheep. No infrastructure is located within this habitat. The habitat is shown in Plate 3-8 *Molinia caerulea* dominated wet heath (HH3).



Plate 3-8 *Molinia caerulea* dominated wet heath (HH3)

3.3.1.1.3 Grasslands

Improved Agricultural Grassland (GA1)

Areas of highly modified/ reclaimed grassland classified as **Improved Agricultural Grassland (GA1)** were recorded to the north of the Proposed Wind Farm, within the Existing Wind Farm. These grasslands were intensively managed via grazing by sheep producing a short uniform sward, with little species diversity and limited biodiversity value. These grasslands were dominated by perennial rye grass (*Lolium perenne*). Other species recorded include sweet vernal grass (*Anthoxanthum odoratum*), common bent (*Agrostis capillaris*), Yorkshire fog (*Holcus lanatus*), white clover (*Trifolium repens*), creeping buttercup (*Ranunculus repens*), Mouse ear chickweed (*Cerastium fontanum*), cocksfoot (*Dactylis glomerata*), jointed rush (*Juncus articulatus*), and dandelion (*Taraxacum officinale* agg.). (Plate 3-9).



Plate 3-9. Intensively managed **Improved Agricultural Grassland (GA1)** to the north of the Site.

Wet Grassland (GS4)

Areas of **Wet Grassland (GS4)** were recorded throughout the Proposed Wind Farm, often as transitional habitats between access roads and conifer plantation/ upland blanket bog and cutover bog. These grasslands were intensively managed via grazing by sheep, producing a uniform sward, with little species diversity and limited biodiversity value. These areas were dominated by soft rush (*Juncus effusus*). Other species recorded include ragwort (*Jacobaea vulgaris*), Yorkshire fog (*Holcus lanatus*), white clover (*Trifolium repens*), meadow buttercup (*Ranunculus acris*), sweet vernal grass (*Anthoxanthum odoratum*), nettle (*Urtica dioica*), false oat grass (*Arrhenatherum elatius*), jointed rush (*Juncus articulatus*), and tormentil (*Potentilla erecta*) Plate (3-10).



Plate 3-10. **Wet Grassland (GS4)** recorded to the east of the Site, dominated by soft rush.

Dry-Humid Acid Grassland (GS3)

Areas of **Dry-Humid Acid Grassland (GS3)** were recorded throughout the Proposed Wind Farm. Species recorded in these areas include common bent grass (*Agrostis capillaris*), Yorkshire fog (*Holcus lanatus*), soft rush (*Juncus effusus*), sweet vernal grass (*Anthoxanthum odoratum*), heath bedstraw (*Galium saxatile*), tormentil (*Potentilla erecta*), Purple Moor-grass (*Molinia caerulea*), *Rhytidiadelphus loreus*, *Pleurozium schreberi*, *Hylocomium splendens*, *Sphagnum palustre*, *Sphagnum fallax* and *Sphagnum papillosum*. These areas were intensively managed by on-going sheep grazing, producing a short uniform sward, with little species diversity (Plate 3-11).

The **access road to T12** is located on a mosaic of degraded **Dry-Humid Acid Grassland (GS3)/ Wet Grassland (GS4)** in the east of the Site.

Further areas of transitional HumidGS3/GS4 were recorded along existing access road margins, and surrounding existing turbine hardstands, which transition into Upland Blanket Bog (PB2) on higher grounds. (Plate 3-12).

Dry-Humid Acid Grassland (GS3) has links the Annex I habitat ‘*species-rich Nardus grasslands on siliceous substrates in mountain areas*’. However, as stated in Fossitt (2000) ‘*high species diversity is not characteristic but species-poor stands that appear to be the product of overgrazing are excluded*’. As such, due to the degraded nature of this mosaic habitat as a result of intensive sheep grazing, these areas do not conform to the Annex I habitat.



Plate 3-11. Mosaic of **Dry-Humid Acid Grassland/Wet Grassland (GS3/GS4)** to the east of the site, where the access road from T12 is located.



Plate 3-12. Mosaic of transitional **Dry-Humid Acid Grassland/Wet Grassland (GS3/GS4)** to the south of T13, which transitions into Upland Blanket Bog (PB2).

3.3.1.1.4 Artificial Habitats

Spoil and Bare Ground (ED2)

Areas of exposed gravel and stone classified as **Spoil and Bare Ground (ED2)** were recorded throughout the Proposed Wind Farm, associated with Existing Wind Farm infrastructure, forestry/ farm access tracks, and areas of recently excavated grasslands (Plate 3-15).



Plate 3-13. **Spoil and bare ground (ED2)** recorded throughout the Proposed Wind Farm Site at existing turbine bases.

Recolonising Bare Ground (ED3)

Areas of **Recolonising Bare Ground (ED3)** were recorded throughout the Proposed Wind Farm, often associated with forestry access roads, Existing Wind Farm infrastructure, recently felled woodland, and mounds of spoil/ gravel. Areas of spoil/ gravel to the southeast of the Proposed Wind Farm have become recolonised with ling heather (*Calluna vulgaris*), mat-grass (*Nardus stricta*), goat willow (*Salix caprea*), *Polytrichum commune*, cross-leaved heather (*Erica tetralix*), bugle (*Ajuga reptans*) and tormentil (*Potentilla erecta*) (Plate 3-14).



Plate 3-14. Recolonising Bare Ground recorded throughout the Proposed Wind Farm.

Buildings and Artificial Surfaces (BL3)

Existing forestry/farm access tracks, Existing Wind Farm infrastructure (roads, hardstands, existing turbines) and the local road network within the Proposed Wind Farm and along the Proposed Grid Connection were categorised as **Buildings and Artificial Surfaces (BL3)** Any private dwellings and/or agricultural buildings within the Site were also categorised as Buildings and Artificial Surfaces (BL3) (Plate 3-15 and Plate 3-16).



Plate 3-15. Existing Wind Farm infrastructure classified as **Buildings and artificial surfaces (BL3)** recorded throughout the Proposed Wind Farm.



Plate 3-16. Existing Wind Farm infrastructure classified as **Buildings and artificial surfaces (BL3)** recorded throughout the Proposed Wind Farm.

3.3.1.1.5 Scrub (WS1)

Areas of **Scrub (WS1)** were recorded throughout the Proposed Wind Farm. These areas were dominated by gorse (*Ulex europaeus*), bramble (*Rubus fruticosus agg.*), bracken (*Pteridium aquilinum*) (Plate 3-17).



Plate 3-17. **Scrub (WS1)** recorded to the west of the Proposed Wind Farm.

3.3.1.1.6 Dense Bracken (HD1)

Areas dominated by dense, continuous bracken classified as **Dense Bracken (HD1)** were recorded to the west and east of the Proposed Wind Farm. Areas of dense bracken were often recorded along riverbanks, and in areas of recently felled conifer plantation (Plate 3-18).



Plate 3-18. **Dense Bracken (HD1)** located to the centre of the Site.

3.3.1.1.7 Watercourses

Drainage Ditch (FW4)

Drainage Ditches (FW4) were recorded throughout the Proposed Wind Farm, mainly associated with areas of coniferous forestry, and along the margins of forestry/ farm access roads/ public roads. The drains were linear and generally 1-1.5m wide. Flow types varied, with dry drains with no flow or stagnant water, and drains with faster flowing water recorded throughout the Proposed Wind Farm (Plates 3-19). A network of drainage ditches was also recorded in the peatland areas. The size of the peatland drains was variable in size from shallow drains of approximately 40cm to deep drains of over 1.5m.



Plate 3-19. Large Drainage Ditch (FW4) recorded within Conifer Plantation to the east of the Proposed Wind Farm.

Eroding Upland River (FW1)

Various EPA mapped river waterbodies flow through the Proposed Wind Farm Site, namely the Buncrowey River (Plate 3-20), Easky River, Letterunshin River, Dunneill River (Plate 3-21), Lagoon Stream and Doonbeakin River. These EPA mapped watercourses were classified as **Eroding Upland Rivers (FW1)**.



Plate 3-20. Buncrowey River classified as an **Eroding Upland River (FW1)** located to the west of the Proposed Wind Farm.



Plate 3-21. Dunneill River classified as an **Eroding Upland River (FW1)** to the southeast of the Site.

3.3.1.2 Habitats Recorded Along the Proposed Grid Connection Route

The Proposed Grid Connection Route will be installed predominantly within the existing road network, classified as **Buildings and Artificial Surfaces (BL3)** (Plate 3-22). Habitats recorded adjacent to the existing road network along the extent of the Proposed Grid Connection Route, outside of the proposed works footprint, include **Hedgerow (WL1)** and **Treeline (WL2)**. **Dry meadows and grassy verges (GS2)** were recorded along the extent of the Proposed Grid Connection Route, often in association with the understorey of hedgerows (WL1) and treelines (WL2). **Wet grassland (GS4)** and **Improved agricultural grassland (GA1)** were recorded adjacent to the Proposed Grid Connection Route.

The Proposed Grid Connection Route crosses 31 EPA mapped watercourses classified as **Eroding/Upland Rivers (FW1)/Depositing/lowland rivers (FW2)** (Plate 3-23) and 3 unmapped watercourses classified as **drainage ditches (FW4)**. The Proposed Grid Connection Route will be installed in-road and as such will cross these watercourses via existing crossing structures.



Plate 3-22. Existing Road Network along the Proposed Grid Connection Route classified as **Buildings and artificial surfaces (BL3)**.



Plate 3-23. The Unshin River classified as a *Depositing/lowland river (FW2)* recorded along the Proposed Grid Connection Route.

3.3.1.3 Habitats Recorded Within Turbine Delivery Route Accommodation Areas

Wind turbine components will be delivered to the Site from Killybegs Port, as detailed in Section 2.3.3. Accommodation works are required at 20 no. locations along the delivery route. Locations 1 to 9, 12, 15, and 16 comprise minor temporary alterations to the existing streetscape such as along footpaths and road verges, as such there will be no perceptible impacts on biodiversity.

A temporary run-over area and visibility splay will be required at Location 10 (Dromore West), Location 11 (N15 to N59 Junction), Location 13 (N59 Ballysadare Bridge), Location 14 (N59 Abbeytown Bend), Location 17 (Dromore West Turn South), Location 18 (Right Bend in L2702), Location 19 (Left Bend in L2702), and Location 20 (L2702/L6309 Junction) in order to accommodate the wind turbine vehicles. This utilises an overrun area used for the delivery of components to the Existing Wind Farm. The temporary overrun area will only be used for the transportation of abnormally sized loads. Upon the completion of the construction phase, the temporary road will be covered with a layer of topsoil and reseeded.

The temporary overrun area is required in the field east of the L2702/L6309 junction (location no. 20) in order to accommodate wind turbine vehicles in the townland of Crowagh or Dunneill Mountain. The temporary overrun area will only be used for the transportation of abnormally sized loads. Upon the completion of the construction phase, the temporary road will be covered with a layer of topsoil and reseeded. This overrun area is designed to run through a gap in the existing hedgerow and will facilitate the retention of a hedgerow with trees at the junction. Approximately 0.06ha of Dry humid acid grassland (GS3) will be temporarily lost.

Limited areas of vegetation along the road corridor may need to be trimmed to accommodate irregular loads, however this comprises temporary reduction in cover and vegetation will not be removed in these habitats.

3.3.2 Faunal Surveys

3.3.2.1 Aquatic Surveys (Atlantic Salmon)

Surveying along watercourse crossings within the Unshin River SAC included electrofishing surveys and fishery habitat assessment surveys to identify the suitability and presence of Atlantic salmon within the assessed watercourses at the assessed survey locations.

The Aquatic Baseline Report (**Appendix 1**) associated with this NIS identified that:

‘Atlantic salmon were absent from electro-fishing surveys undertaken at GCR crossing sites C1-C15, although the Owenmore and Unshin Rivers (fisheries appraisal sites, also crossed by the GCR) are known to support the species.’

Sites C13-C15 comprised electrofishing sites where the Proposed Grid Connection Route along the R284 road crossing is within the Owenmore (Sligo)_SC_030 subcatchment area, which have hydrological connectivity to the Unshin River SAC.

Fisheries habitat assessments of visited sites along the Proposed Grid Connection Route crossings within the Owenmore subcatchment areas (which comprise the Unshin River SAC at points) generally noted suitability of the watercourses to support salmonids, including Atlantic salmon, despite their absence in electrofishing surveys conducted along the Proposed Grid Connection Route.

The Proposed Wind Farm is located within a separate hydrological subcatchment from Unshin River SAC. Therefore, there is no hydrological connectivity via surface water pathways between the site of the Proposed Wind Farm and the Unshin River SAC, of which Atlantic salmon is a Qualifying Interest.

3.3.2.2 Otter Surveys

Watercourses within the vicinity of the Proposed Wind Farm and along the Proposed Grid Connection Route were surveyed for signs of otter. The Proposed Grid Connection Route crosses the Unshin River SAC, which has otter listed as a QI species.

The Proposed Wind Farm is located within a separate hydrological subcatchment to this European site and as such there is no hydrological connectivity between the two via surface water pathways.

Otter signs were recorded on 9 of the aquatic survey locations as summarised in the Aquatic Baseline Report, **Appendix 1**.

‘Otter signs (comprising spraint sites & latrines) were recorded at 9 no. sites during the current survey. These were identified at sites on an unnamed Easky River tributary (site A7), the Buncrowey River (A18), Dunneill River (B8), Lugdoon Stream (B15), Barnabrack River (C8), Tanrego Intake (C9), Dunmorán Trib West River (D2), Unshin River (D7) and the Ballygrania River (D10).’

‘No breeding (holts) or resting (couch) areas were identified in the vicinity of the survey sites in July or September 2024.’

Site D7, located along a Proposed Grid Connection Route crossing point over the Unshin River, (and within the Unshin River SAC) was noted as a regular sprainting site for otter at the time of survey.

The Aquatic Baseline Report concluded that:

‘Otters are known to be present on other watercourses in the vicinity of the proposed project and are listed as a qualifying interest of the Unshin River SAC (001898) with which a number of survey watercourses share hydrological connectivity. No breeding (holts) or resting (couch) areas were identified in the vicinity of the survey sites in July or September 2024.’

A map of the survey sites visited as part of the Aquatic Baseline Assessment is provided in the **Aquatic Baseline Report (Appendix 1)**.

The Proposed Wind Farm is located within a separate hydrological subcatchment from Unshin River SAC. Therefore, there is no hydrological connectivity via surface water pathways between the site of the Proposed Wind Farm and the Unshin River SAC, of which Otter is a Qualifying Interest.

3.3.2.3 Geyer’s Whorl Snail Habitat Suitability Assessment

The QI population of the Geyer’s Whorl Snail (*Vertigo geyeri*) is located in a parcel of land within the Existing Wind Farm that is designated as part of the Ox Mountains Bogs SAC. This area lies completely outside the Existing and Proposed Wind Farm infrastructure footprint but is adjacent to existing turbines at Dunneill Wind Farm that will be decommissioned.

The potential for the species to occupy other areas within the Site Boundary was considered. As discussed in Section 1.4.3.4, optimal habitat for the species comprises calcareous fen habitats with sedges, moss carpets, and black-bog rush. Sub-optimal habitat can occur in more acidic habitats, such as the peatland and grassland habitats present within the Site Boundary, however to support the species, flushed areas containing wet and groundwater-influenced conditions are required.

The above-described habitat types were not recorded within the footprint of the Proposed Wind Farm, which is dominated by conifer plantation (WD4), and acidic habitats such as cutover bog (PB4), and dry-humid acid grassland (GS3). No fen or flushed areas were recorded in habitats within or adjacent to the footprint of the Proposed Project. These habitats are unsuitable for the species and as such targeted surveys for the species in these areas was not required.

3.3.3 Bird Surveys

In order to inform the scope of the bird surveys required for the NIS, a review was undertaken of the location of adjacent Special Protection Areas (SPAs), associated SCI species and other Annex I species associated with surrounding SPAs so that the survey design would include a focus on target SCI and Annex I species in addition to all species captured for the purpose of the EIAR Chapter 7: *Birds*, associated with the planning application for the Proposed Project. Details of the methodologies used for the bird surveys is provided in Section 1.4.4 above.

Where relevant, details of records of SCI designated species associated with nearby SPAs observed during the ornithological survey period April 2021-March 2025 at the Proposed Wind Farm site are provided below. If bird species occur as Special Conservation Interests (SCIs) in more than one of the assessed SPAs, they are listed according to the proximity of those SPAs to the Proposed Project, starting with the nearest SPA in which they are a qualifying feature.

Ballysadare Bay SPA [004129]: The Proposed Grid Connection Route is located approx. 400m from this European site, whereas it is separated from the Proposed Wind Farm by a distance of 10.4km.

- [A046] Light-bellied brent goose *Branta bernicla hrota*: Light-bellied brent goose was not observed within the vicinity of the Proposed Wind Farm during the bird survey period.
- [A141] Grey plover *Pluvialis squatarola*: was not observed within the vicinity of the Proposed Wind Farm during the bird survey period.
- [A149] Dunlin *Calidris alpina alpina*: Dunlin was observed four times during breeding walkover surveys, on 3 of the 112 survey days (3%). At all of the three locations, Dunlin were

observed in breeding plumage. Furthermore, Dunlin was recorded 32 times during waterbird distribution and abundance surveys, on 23 of 120 survey dates (19%). Between 1 and 320 birds were observed during the winter and passage (April, May, August and September) seasons. The average flock size was 34 birds.

- [A157] Bar-tailed Godwit *Limosa lapponica*: This species was not observed within the immediate vicinity of the Proposed Wind Farm during the bird survey period. The nearest record was approximately 4.9km from the Proposed Wind Farm. There was one observation of four birds foraging at Donaghintraire beach in April 2022. There were also three other observations of two to four birds foraging at Aughris Beach in November 2023 and March 2023.
- [A162] Redshank *Tringa totanus*: Redshank was not observed within the immediate vicinity of the Proposed Wind Farm during the bird survey period. The nearest record was approximately 1.5km from the Proposed Wind Farm.

Aughris Head SPA [004133]: This SPA is located approx. 3.8km from the Proposed Grid Connection Route and approx. 7.2km from the Proposed Wind Farm.

- [A188] Kittiwake *Rissa tridactyla*: This species was not observed within the immediate vicinity of the Proposed Wind Farm during the bird survey period. The nearest record was approximately 4.3km from the Proposed Wind Farm. There were 24 observations of flocks of 2 to 65 birds flying, foraging, and nesting along the coast north of the site during the winter season, and occasionally in August, September, and May.

Cummeen Strand SPA [004035]: This SPA is located approx. 6.3km from the Proposed Grid Connection Route and approx. 14.6km from the Proposed Wind Farm.

- [A046] Brent Goose *Branta bernicla hrota*: This species was not observed within the vicinity of the Proposed Wind Farm during the bird survey period.
- [A130] Oystercatcher *Haematopus ostralegus*: This species was not observed within the immediate vicinity of the Proposed Wind Farm during the bird survey period. The nearest record was approximately 4.2km from the Proposed Wind Farm. There were 284 observations of flocks between 1 and 42 birds foraging, resting, and flying along the coast, north of the Proposed Wind Farm, and at Ardogelly turlough. All these observations were made during the winter and passage season (August to May inclusive).
- [A162] Redshank *Tringa totanus* is considered under Ballysadare Bay SPA above.

Drumcliff Bay SPA [004013]: The SPA is located approx. 9km from the Proposed Grid Connection Route and approx. 15.8km from the Proposed Wind Farm.

- [A144] Sanderling *Calidris alba*: This species was not observed within the vicinity of the Proposed Wind Farm during the bird survey period.
- [A157] Bar-tailed Godwit *Limosa lapponica* is considered under Ballysadare SPA above.

Killala Bay/Moy Estuary SPA [004036]: The SPA is located approx. 14.6km to the west of the Proposed Wind Farm.

- [A137] Ringed plover *Charadrius hiaticula*: This species was not observed within the vicinity of the Proposed Wind Farm during the bird survey period.
- [A160] Curlew *Numenius Arquata*: This species was not observed within the immediate vicinity of the Proposed Wind Farm during the bird survey period. The nearest record was approximately 900m from the Proposed Wind Farm. There were 133 records of flocks of 1 to 44 birds, foraging, roosting and flying along the coast, north of the site during winter and passage season. There were also three records of birds flying and calling within 2km of the Proposed Wind Farm.
- [A140] Golden plover *Pluvialis apricaria*: Golden plover was recorded 128 times during vantage point surveys, or on average once every 12 hours of winter and passage season (April,

May and September) surveys. Of these records, 34 were within 500m of the Proposed Turbines. Between 1 and 150 individuals were observed during the winter and passage season. The average flock size was 30 birds.

Golden plover was recorded 19 times during winter walkover surveys, on 10 of the 55 survey dates (18%). Of these records, seven were within or partially within the Proposed Wind Farm. Between 1 and 110 individuals were observed. The average flock size was 27 birds.

Golden plover was recorded 10 times during breeding walkover surveys, on 8 of the 112 survey dates (7%). Of these records, none were within or partially within the Proposed Wind Farm. Between 1 and 25 individuals were observed. The average flock size was 5 birds.

- > [A141] Grey Plover *Pluvialis squatarola* is considered under Ballysadare Bay SPA above.
- > [A144] Sanderling *Calidris alba* is considered under Drumcliff Bay SPA above.
- > [A149] Dunlin *Calidris alpina* is considered under Ballysadare Bay SPA above.
- > [A157] Bar-tailed Godwit is considered under Ballysadare Bay SPA above.
- > [A162] Redshank *Tringa totanus* is considered under Ballysadare SPA above.

4.

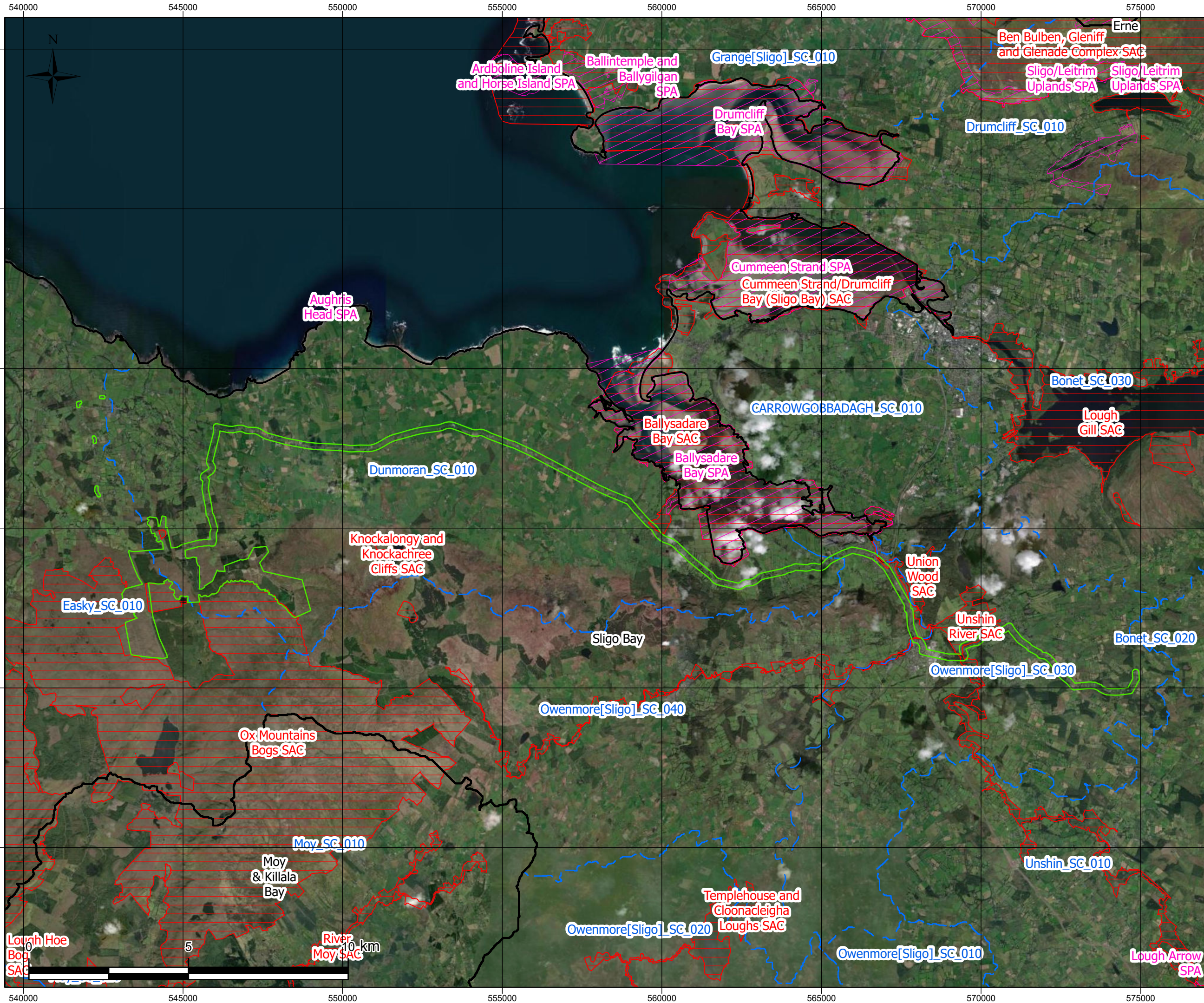
APPROPRIATE ASSESSMENT SCREENING

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) and the EPA website (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 Proposed Project 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), 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

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

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

SITE LOCATION - NOT TO SCALE

Site in Relation to European Designated Sites

Project Title
Crumhach Wind Farm

Project No.	Drawing No.	Scale
230841	4-1	1:110,000

Drawn By	Checked By	Date
OM	JK	06/08/2026

Email: info@mkofireland.ie / Website: www.mkofireland.ie

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 ⁹)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Special Areas of Conservation (SAC)				
Ox Mountains Bogs SAC [002006] <u>Distances:</u> Proposed Wind Farm: The Proposed Site Boundary overlaps with the boundary of this SAC. Proposed Grid Connection Route: 0.68km	➤ [1013] Geyer's Whorl Snail <i>Vertigo geyeri</i> ➤ [1528] Marsh Saxifrage <i>Saxifraga hirculus</i> ➤ [3110] Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) ➤ [3160] Natural dystrophic lakes and ponds ➤ [4010] Northern Atlantic wet heaths with (<i>Erica tetralix</i>) ➤ [4030] European dry heaths ➤ [7130] Blanket bogs (* if active bog) ➤ [7140] Transition mires and quaking bogs	Detailed conservation objectives for this site, (Version 1, August 2016), were reviewed as part of the assessment and are available at www.npws.ie	A portion of the Proposed Grid Connection Route and this SAC are located within the same subcatchment area. However, there is no hydrological connectivity between the Proposed Grid Connection Route and the SAC along its course beyond the Site Boundary. The Proposed Grid Connection Route is to be set within existing road infrastructure. There is no potential for direct or indirect effect to this SAC as a result of the Proposed Grid Connection Route. The Proposed Wind Farm encompasses a small parcel of land which forms a component of this SAC. Furthermore, the southern and western Site Boundary directly borders the SAC. The aforementioned small parcel of land which comprises part of this SAC is located at the northern extent of the Site Boundary located approx. 690m to the north of T7. This parcel is mapped in the associated Conservation Objectives document (2016) as hosting QI habitats and species including [4010] northern Atlantic wet heaths with (<i>Erica tetralix</i>), [4030] European dry heaths, and [7130] blanket bogs (if active) and [1013] Geyer's whorl snail.	Yes

⁹ 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 ⁹)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
	➤ [7150] Depressions on peat substrates of the Rhynchosporion		Given that the Site Boundary directly encompasses areas of this European Site, the potential for direct effect as a result of the Proposed Project exists. A potential pathway for direct effect via habitat loss to these QI habitats where they occur within the Site Boundary was identified. Furthermore, a potential indirect effect to QI aquatic and wetland habitats located outside of the Site Boundary as a result of hydrological alterations and water quality deterioration within the surrounding area was identified. A potential pathway for indirect effect to the supporting habitat of Geyer's whorl snail exists, given that this species is highly dependent on specific hydrological alterations and any changes to the water table within the vicinity of their occupied habitat could negatively impact the existing population. A complete source-pathway receptor chain was identified via direct impacts to listed QI habitats of this SAC. A complete source-pathway receptor chain was also identified via indirect effects to the hydrologically influenced habitats of this SAC and supporting habitats for Geyer's whorl snail. A complete source-pathway-receptor chain was identified and in the absence of mitigation, there is potential for the Proposed Project to	

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
			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	
Ballysadare Bay SAC [000622] <u>Distances:</u> Proposed Wind Farm: 10.4km Proposed Grid Connection Route: 5m	➤ [1014] Narrow-mouthed Whorl Snail <i>Vertigo angustior</i> ➤ [1130] Estuaries ➤ [1140] Mudflats and sandflats not covered by seawater at low tide ➤ [1365] Harbour seal <i>Phoca vitulina</i> ➤ [2110] Embryonic shifting dunes ➤ [2120] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) ➤ [2130] Fixed coastal dunes with herbaceous vegetation (grey dunes) ➤ [2190] Humid dune slacks	Detailed conservation objectives for this site, (Version 1, November 2013), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Grid Connection Route and the Proposed Wind Farm are located completely outside of the boundary of this SAC. The Proposed Wind Farm is located a significant intervening distance of 10.4km from this European Designated Site. The Proposed Wind Farm is located partially within the same subcatchment area as the southern extent of this European Site. However, all surface watercourses draining the Proposed Wind Farm within the Dunmorán_SC_010 subcatchment discharge to the coast to the west of Ballysadare Bay. Therefore, there is no potential for indirect effect to this European Site as a result of the Proposed Wind Farm, as there is no hydrological connectivity between the two. The Proposed Grid Connection Route is located adjacent to the SAC at two locations (within ~5m and ~580m respectively) along the Proposed Grid Connection Route. It is noted that there are mapped watercourses which will be crossed by or traversed within the vicinity of the Proposed Grid Connection Route at these locations, which are likely to provide hydrological connectivity between the Proposed Grid Connection Route and the SAC.	Yes

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
			Furthermore, there are multiple crossing points of the Proposed Grid Connection Route over watercourses within the subcatchment areas of the Owenmore (Sligo), including Owenmore (Sligo)_SC_030 and Owenmore (Sligo)_SC_040. These crossing points have the potential to provide additional hydrological connections between the Proposed Grid Connection Route and this European site. A potential pathway for indirect effect on the SAC was identified via deterioration of water quality as a result of the Proposed Grid Connection Route. 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.	
Unshin River SAC [001898] <u>Distances:</u> Proposed Wind Farm: 4.5km	> [1106] Salmon <i>Salmo salar</i> > [1355] Otter <i>Lutra lutra</i> > [3260] Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	Detailed conservation objectives for this site, (Version 1, December 2021), were reviewed as part of the assessment and	The Proposed Wind Farm and this European Designated Site are located in separate hydrological subcatchments, with no hydrological connectivity between the two. There is therefore no pathway for effect between the Proposed Wind Farm and this European site. The Proposed Grid Connection Route has multiple proposed crossing routes within the subcatchment areas of the Owenmore (Sligo), including within the Owenmore (Sligo)_SC_030 and	Yes

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Proposed Grid Connection Route: The Proposed Grid Connection Route crosses this SAC.	> [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) > [6410] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) > [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>)*	are available at www.npws.ie	Owenmore (Sligo)_SC_040, in which sections of this SAC are located within. Furthermore, the Proposed Grid Connection Route traverses immediately adjacent to the left-bankside of the Ballysadare River for a section within the town of Ballysadare. This river at this location forms a component of the Unshin River SAC. The Proposed Grid Connection Route also crosses the Unshin River SAC. A potential pathway for indirect effect on the SAC was identified via deterioration of water quality as a result of the Proposed Grid Connection Route. 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.	
Union Wood SAC [000638] <u>Distances:</u> Proposed Wind Farm: 18.8km	> [91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	Detailed conservation objectives for this site, (Version 1, January 2021), were reviewed as part of the	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. Although this European site is bordered by the Ballysadare River, which at this location is approx. 1.7km downstream of a Proposed Grid Connection crossing point on the Owenmore River, the terrestrial nature of the woodland habitat for which this SAC is	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Proposed Grid Connection Route: 0.2km		assessment and are available at www.npws.ie	designated negates the possibility of indirect effects via a hydrological pathway. There is no identifiable pathway by which the sole QI habitat of this SAC could be affected as a result of the Proposed Project. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Knockalongy and knockachree Cliffs SAC [001669] <u>Distances:</u> Proposed Wind Farm: 2.4 km Proposed Grid Connection Route: 2.8km	➤ [6985] Killarney Fern <i>Vandenboschia speciosa</i>	Detailed conservation objectives for this site, (Version 1, December 2020), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. There are no surface watercourses flowing from the Proposed Wind Farm or the Proposed Grid Connection route to this European Site, thus discounting the potential for connectivity via surface water pathways. This European Site is situated within the Collooney Groundwater Body, which is also occupied by partial sections of the Proposed Wind Farm and the Proposed Grid Connection Route. This groundwater body has a predominant SW-NE structural trend, however has low relative recharge rates from rainfall owing to the low	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
			permeability of much of the subsoil, which is blanket peat. Instead, rainfall tends to discharge to the surrounding streams (GSI, 2004), of which there are a high density in the area surrounding this European site. Given the tendency of rainfall to migrate to streams within the surrounding area rather than the underlying groundwater body, there is no potential for indirect effects to the terrestrial QI species of this SAC as a result of the Proposed Project via groundwater pathways. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Lough Gill SAC [001976] <u>Distances:</u> Proposed Wind Farm: 21.7km	➤ [1092] White-clawed Crayfish <i>Austropotamobius pallipes</i> ➤ [1095] Sea Lamprey <i>Petromyzon marinus</i> ➤ [1096] Brook Lamprey <i>Lampetra planeri</i> ➤ [1099] River Lamprey <i>Lampetra fluviatilis</i>	Detailed conservation objectives for this site, (Version 1, December 2021), were reviewed as part of the assessment and	There is no potential for direct effect as the Proposed Project is located completely outside of the European Site. This European Site and The Proposed Project are located in separate hydrological subcatchments and in separate groundwater bodies. The SAC is located over 4.5km from the Proposed Grid Connection Route and over 21.7km from the Proposed Wind Farm.	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Proposed Grid Connection Route: 4.5km	➤ [1106] Salmon <i>Salmo salar</i> ➤ [1355] Otter <i>Lutra lutra</i> ➤ [3150] Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation ➤ [6210] Semi-natural dry grasslands and scrubland facies on calcareous ➤ [91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles ➤ [91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)	are available at www.npws.ie	There is no potential for indirect effects as there is no hydrological connectivity between the Proposed Project and the SAC. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Cummeen strand/Drumcliff Bay SAC [000627] <u>Distances:</u>	➤ [1014] Narrow-mouthed Whorl Snail <i>Vertigo angustior</i> ➤ [1095] Sea Lamprey <i>Petromyzon marinus</i> ➤ [1099] River Lamprey <i>Lampetra fluviatilis</i>	Detailed conservation objectives for this site, (Version 1, July 2024), were reviewed as part of the assessment	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. This European Site and The Proposed Project are located in separate hydrological subcatchments and in separate groundwater bodies. The SAC is located over 5.4km from the Proposed Grid Connection Route and over 14km from the Proposed Wind Farm. There is no	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Proposed Wind Farm: 14km Proposed Grid Connection Route: 4.9km	➤ [1130] Estuaries ➤ [1140] Mudflats and sandflats not covered by seawater at low tide ➤ [1365] Harbour Seal <i>Phoca vitulina</i> ➤ [2110] Embryonic shifting dunes ➤ [2120] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) ➤ [2130] Fixed coastal dunes with herbaceous vegetation (grey dunes)* ➤ [5130] <i>Juniperus communis</i> formations on heaths or calcareous grasslands ➤ [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites)	and are available at www.npws.ie	potential for indirect effects as there is no hydrological connectivity between the Proposed Project and the SAC. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
	➤ [7220] Petrifying springs with tufa formation (Cratoneurion)*			
River Moy SAC [002298] Distances: Proposed Wind Farm: 7.9km Proposed Grid Connection Route: 15.3km	➤ [1092] White-clawed Crayfish <i>Austropotamobius pallipes</i> ➤ [1095] Sea Lamprey <i>Petromyzon marinus</i> ➤ [1096] Brook Lamprey <i>Lampetra planeri</i> ➤ [1106] Salmon <i>Salmo salar</i> ➤ [1355] Otter <i>Lutra lutra</i> ➤ [7110] Active raised bogs* ➤ [7120] Degraded raised bogs still capable of natural regeneration ➤ [7150] Depressions on peat substrates of the Rhynchosporion ➤ [7230] Alkaline fens ➤ [91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	Detailed conservation objectives for this site, (Version 1, August 2016), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. This European Site and The Proposed Project are located in separate hydrological subcatchments and in separate groundwater bodies. The SAC is located over 7.9km from the Proposed Project. There is no potential for indirect effects as there is no hydrological connectivity between the Proposed Project and the SAC. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
	[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>)*			
Templehouse and Cloonacleigha Lough SAC [000636] <u>Distances:</u> Proposed Wind Farm: 13.8km Proposed Grid Connection Route: 9km	[3140] Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3260] Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	Detailed conservation objectives for this site, (Version 1, October 2021), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. This European Site and the Proposed Project are located in separate hydrological subcatchments and in separate groundwater bodies. The SAC is located over 9km from the Proposed Grid Connection Route and over 13.8km from the Proposed Wind Farm. There is no potential for indirect effects as there is no hydrological connectivity between the Proposed Project and the SAC. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	No
Lough Arrow SAC [001673]	[3140] Hard oligo-mesotrophic waters with	Detailed conservation objectives for this	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site.	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
<u>Distances:</u> Proposed Wind Farm: 29.9km Proposed Grid Connection Route: 9.3km	benthic vegetation of Chara spp.	site, (Version 1, October 2021), were reviewed as part of the assessment and are available at www.npws.ie	This European Site and The Proposed Project are located in separate hydrological subcatchments and in separate groundwater bodies. The SAC is located over 9.3km from the Proposed Grid Connection Route and over 29km from the Proposed Wind Farm. There is no potential for indirect effects as there is no hydrological connectivity between the Proposed Project and the SAC. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Lough Nabrickkeagh Bog SAC [000634] <u>Distances:</u> Proposed Wind Farm: 9.5km	➤ [7130] Blanket bogs (* if active bog)	Detailed conservation objectives for this site, (Version 1, March 2019), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. This European Site and The Proposed Project are located in separate hydrological subcatchments and in separate groundwater bodies. The SAC is located over 9.5km from the Proposed Wind Farm and over 13.2km from the Proposed Grid Connection Route. There is no potential for indirect effects as there is no hydrological connectivity between the Proposed Project and the SAC.	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Proposed Grid Connection Route: 13.2km			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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Lough Hoe Bog SAC [000633] <u>Distances:</u> Proposed Wind Farm: 10.9 km Proposed Grid Connection Route: 14.6km	➤ [1013] Geyer's Whorl Snail <i>Vertigo geyeri</i> ➤ [1092] White-clawed Crayfish <i>Austropotamobius pallipes</i> ➤ [3110] Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) ➤ [7130] Blanket bogs (* if active bog)	Detailed conservation objectives for this site, (Version 1, August 2017), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Site. This European Designated Site and the Proposed Project are located in separate hydrological subcatchments and in separate groundwater bodies. The SAC is located over 10.9km from the Proposed Wind Farm and over 14.6km from the Proposed Grid Connection Route. There is no potential for indirect effects as there is no hydrological connectivity between the Proposed Project and the SAC. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Bricklieve Mountains and Keshcorran SAC [001656] Distances: Proposed Wind Farm: 25.9km Proposed Grid Connection Route: 11km	➤ [1065] Marsh Fritillary <i>Euphydryas aurinia</i> ➤ [1092] White-clawed Crayfish <i>Austropotamobius pallipes</i> ➤ [3180] Turloughs* ➤ [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) ➤ [6510] Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>) ➤ [8120] Calcareous and calcshist screes of the montane to alpine levels (<i>Thlaspietea rotundifolii</i>)	Detailed conservation objectives for this site, (Version 1, December 2021), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Site. This European Designated Site and the Proposed Project are located in separate hydrological subcatchments and in separate groundwater bodies. The SAC is located over 11km from the Proposed Grid Connection Route and over 25.9km from the Proposed Wind Farm. There is no potential for indirect effects as there is no hydrological connectivity between the Proposed Project and the SAC. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	No
Turloughmore (Sligo) SAC [000637]	➤ [3180] Turloughs*	Detailed conservation objectives for this site, (Version 1,	There is no potential for direct effect as the Proposed Project is located completely outside of this European Designated Site.	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
<u>Distances:</u> Proposed Wind Farm: 14.8km Proposed Grid Connection Route: 15.8km		January 2021), were reviewed as part of the assessment and are available at www.npws.ie	This European Designated Site and The Proposed Project are located in separate hydrological subcatchments and in separate groundwater bodies. The SAC is located over 14.8km from the Proposed Wind Farm and over 15.8km from the Proposed Grid Connection Route. There is no potential for indirect effects as there is no hydrological connectivity between the Proposed Project and the SAC. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Ben Bulbin Gleniff and Glenade Complex SAC [000623] <u>Distances:</u> Proposed Wind Farm: 25.6km	➤ [1013] Geyer's Whorl Snail <i>Vertigo geyeri</i> ➤ [1355] Otter <i>Lutra lutra</i> ➤ [3260] Water courses of plain to montane levels with the Ranunculion fluitantis and (Festuco-Brometalia) (* important orchid sites)	Detailed conservation objectives for this site, (Version 1, December 2021), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. This European Designated Site and The Proposed Project are located in separate hydrological subcatchments and in separate groundwater bodies. The SAC is located over 14.6km from the Proposed Grid Connection Route and over 25.6km from the Proposed Wind Farm. There is no potential for indirect effects as there is no hydrological connectivity between the Proposed Project and the SAC.	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Proposed Grid Connection Route: 14.6km	➤ [4010] Northern Atlantic wet heaths with <i>Erica tetralix</i> ➤ [4030] European dry heaths ➤ [4060] Alpine and Boreal heaths ➤ [5130] Juniperus communis formations on heaths or calcareous grasslands ➤ [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates ➤ [6230] Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)* ➤ [6430] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (<i>Galeopsietalia ladani</i>)		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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
	➤ [7130] Blanket bogs (* if active bog) ➤ [7140] Transition mires and quaking bogs ➤ [7220] Petrifying springs with tufa formation (Cratoneurion)* ➤ [7230] Alkaline fens ➤ [8110] Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) ➤ [8120] Calcareous and calcshist screes of the montane to alpine levels (<i>Thlaspietea rotundifolii</i>) ➤ [8210] Calcareous rocky slopes with chasmophytic vegetation			
Killala Bay/Moy Estuary SAC [000458] <u>Distances:</u>	➤ [1014] Narrow-mouthed Whorl Snail <i>Vertigo angustior</i> ➤ [1095] Sea Lamprey <i>Petromyzon marinus</i> ➤ [1130] Estuaries	Detailed conservation objectives for this site, (Version 1, October 2012), were reviewed as	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. This European Designated Site and The Proposed Project are located in separate hydrological subcatchments and in separate groundwater	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Proposed Wind Farm: 14.5km Proposed Grid Connection Route: 16.3km	➤ [1140] Mudflats and sandflats not covered by seawater at low tide ➤ [1210] Annual vegetation of drift lines ➤ [1310] Salicornia and other annuals colonizing mud and sand ➤ [1330] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) ➤ [1365] Harbour Seal <i>Phoca vitulina</i> ➤ [2110] Embryonic shifting dunes ➤ [2120] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ('white dunes') ➤ [2130] *Fixed coastal dunes with herbaceous vegetation ('grey dunes') ➤ [2190] Humid dune slacks	part of the assessment and are available at www.npws.ie	bodies. The SAC is located over 14.5km from the Proposed Wind Farm and over 16.3km Proposed Grid Connection Route. There is no potential for indirect effects as there is no hydrological connectivity between the Proposed Project and the SAC. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Special Protection Area (SPA)				

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Ballysadare Bay SPA [004129] <u>Distances:</u> Proposed Wind Farm: 10.4km Proposed Grid Connection Route: 5m	➤ [A046] Brent Goose <i>Branta bernicla hrota</i> ➤ [A141] Grey Plover <i>Pluvialis squatarola</i> ➤ [A149] Dunlin Calidris <i>alpina alpina</i> ➤ [A157] Bar-tailed Godwit <i>Limosa lapponica</i> ➤ [A162] Redshank [Tringa tetanus] ➤ [A999] Wetlands	Detailed conservation objectives for this site, (Version 1, October 2013), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. One SCI species, Dunlin, was recorded on Site. However, the mean foraging distances for Dunlin are limited to a core range of 500m with a maximum range of 3km (SNH 2016). Due to the large intervening distance between the Proposed Project and the SPA, there is no pathway for likely significant effect on the SCI species of this SPA due to ex-situ habitat loss, disturbance or collision risk. The SPA is located approximately 5m from the Proposed Grid Connection Route and approx. 10.4km from the Proposed Wind Farm. There are multiple watercourse crossings associated with the Proposed Grid Connection, where some of these watercourses drain to Ballysadare Bay, in which this European site is located. It is likely that there is hydrological connectivity between the Proposed Grid Connection Route and this SPA. Therefore, a potential pathway for indirect effect was identified via water quality deterioration as a result of the Proposed Grid Connection Route.	Yes

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
			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.	
Aughris Head SPA [004133] <u>Distances:</u> Proposed Wind Farm: 7.2km Proposed Grid Connection Route: 3.9km	➤ [A188] Kittiwake <i>Rissa tridactyla</i>	Detailed conservation objectives for this site, (Version 1, April 2025), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. The SPA is located approximately 3.9km from the Proposed Grid Connection Route and approx. 7.2km from the Proposed Wind Farm. This SPA is a small, coastal site designated to support the nesting of one bird species, Kittiwake (<i>Rissa tridactyla</i>). Kittiwake nest in steep, coastal sea cliffs, which is a habitat entirely lacking within the boundary of the Proposed Project. As such, there is no identifiable pathway by which nesting Kittiwake could be directly impacted by the works associated with the Proposed Project. Although the Proposed Project falls within the typical mean foraging range of Kittiwake during their breeding season (55km, Power, McDonnell and Tierney, (2021), Kittiwake are a surface-feeding seabird and as such are not expected to utilise the area of the Proposed Project, which is entirely terrestrial, for feeding or maintenance activity.	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
			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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Cummeen Strand SPA [004035] <u>Distances:</u> Proposed Wind Farm: 14.6km Proposed Grid Connection Route: 6.3km	➤ [A046] Brent Goose <i>Branta bernicla hrota</i> ➤ [A130] Oystercatcher <i>Haematopus ostralegus</i> ➤ [A162] Redshank <i>Tringa totanus</i> ➤ [A999] Wetlands	Detailed conservation objectives for this site, (Version 1, September 2013), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. The SPA is located approximately 6.3km from the Proposed Grid Connection Route and approx. 14.6km from the Proposed Wind Farm. The Proposed Project and this European Site are located within different hydrological subcatchments and groundwater bodies. There is no hydrological connectivity between the Proposed Project and the SPA and there is therefore no potential for likely significant effect to the SCI supporting wetland habitat. Furthermore, the Proposed Wind Farm lies outside of the likely possible foraging range for the SCI species of this SPA, negating the possibility that the site of the Proposed Wind Farm is utilised by the SCI species associated with this SPA.	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
			Due to the large intervening distance between the Proposed Project and the SPA, there is no pathway for likely significant effect on the SCI species due to ex-situ habitat loss, disturbance or collision risk. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Drumcliff Bay SPA [004013] <u>Distances:</u> Proposed Wind Farm: 15.8km Proposed Grid Connection Route: 9.1km	➤ [A144] Sanderling <i>Calidris alba</i> ➤ [A157] Bar-tailed Godwit <i>Limosa lapponica</i> ➤ [A999] Wetlands	Detailed conservation objectives for this site, (Version 1, September 2013), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. The Proposed Project and this European Designated Site are located within different hydrological subcatchments and groundwater bodies. The SPA is located approximately 9.1km from the Proposed Grid Connection Route and approx. 15.8km from the Proposed Wind Farm. There is no hydrological connectivity between the Proposed Project and the SPA and there is therefore no potential for likely significant effect to the SCI supporting wetland habitat. Furthermore, the Proposed Wind Farm lies outside of the foraging range for the SCI species of this SPA, negating the possibility that the	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
			site of the Proposed Wind Farm is utilised by the SCI species associated with this SPA. Due to the large intervening distance between the Proposed Project and the SPA, there is no pathway for likely significant effect on the SCI species due to ex-situ habitat loss, disturbance or collision risk. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Lough Arrow SPA [004050] <u>Distances:</u> Proposed Wind Farm: 29.9km Proposed Grid Connection Route: 15.4km	➤ [A004] Little Grebe <i>Tachybaptus ruficollis</i> ➤ [A061] Tufted Duck <i>Aythya fuligula</i> ➤ [A999] Wetlands	Detailed conservation objectives for this site, (Version 1, February 2025), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. The Proposed Project and this European Designated Site are located within different hydrological subcatchments and groundwater bodies. The SPA is located approximately 15.4km from the Proposed Grid Connection Route and approx. 29.9km from the Proposed Wind Farm. There is no hydrological connectivity between the Proposed Project and the SPA and there is therefore no potential for likely significant effect to the SCI supporting wetland habitat.	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
			Due to the large intervening distance between the Proposed Project and the SPA, there is no pathway for likely significant effect on the SCI species due to ex-situ habitat loss, disturbance or collision risk. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Ardboline Island and Horse Island SPA [004135] <u>Distances:</u> Proposed Wind Farm: 16.1km Proposed Grid Connection Route: 10.5km	➤ [A017] Cormorant <i>Phalacrocorax carbo</i> ➤ [A045] Barnacle Goose <i>Branta leucopsis</i>	Detailed conservation objectives for this site, (Version 1, March 2025), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. The Proposed Project and this European Designated Site are located within different hydrological subcatchments and groundwater bodies. The SPA is located approximately 10.5km from the Proposed Grid Connection Route and approx. 16.1km from the Proposed Wind Farm. There is no hydrological connectivity between the Proposed Project and the SPA and there is therefore no potential for likely significant effect to the SCI supporting wetland habitat. This site is designated for the breeding of Cormorant (<i>Phalacrocorax carbo</i>) and for the winter occupancy of the site by Barnacle Goose	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
			<i>(Branta leucopsis)</i>. Cormorants are a pursuit-diving species that typically forage for benthic and pelagic fish over shallow freshwater, estuarine and marine environments, and have a mean and maximum foraging range of 7km and 35km respectively from their nesting site during the breeding season (Power, McDonnell and Tierney, 2021). Although there are some lentic habitats within the vicinity of the Proposed Wind Farm, given the significant intervening distance which exceeds the mean foraging range of cormorants during the breeding season, and the abundance of productive marine, estuarine and freshwater habitat nearby, it is highly unlikely that breeding cormorants utilising this SPA will frequent the site of the Proposed Project for foraging. The Barnacle Goose is a grazing herbivore that typically forages in areas of salt marsh, however in Ireland are also noted to use open coastal pasture which consists predominantly of improved and semi-improved agricultural grasslands. Given the lack of such habitats within the boundary of the Proposed Project and the significant intervening distance, there exists no potential pathway for significant effect to the foraging habitat of the Barnacle Geese originating from this SPA as a result of the Proposed Project.	

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 ⁹)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
			Due to the large intervening distance between the Proposed Project and the SPA, there is no pathway for likely significant effect on the SCI species of this SPA due to ex-situ habitat loss, disturbance or collision risk. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Ballintemple and Ballygilgan SPA [004234] <u>Distances:</u> Proposed Wind Farm: 17.1km Proposed Grid Connection Route: 10.7km	 [A045] Barnacle Goose <i>Branta leucopsis</i>	Detailed conservation objectives for this site, (Version 1, December 2024), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Site. This site is designated for the winter occupancy of the site by Barnacle Goose (<i>Branta leucopsis</i>). The Barnacle Goose is a grazing herbivore that typically forages in areas of salt marsh, however in Ireland are noted to use open coastal pasture which consists predominantly of improved and semi-improved agricultural grasslands. Given the lack of such habitats within the boundary of the Proposed Project and the significant intervening distance, there exists no	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
			potential pathway for significant effect to the foraging habitat of the Barnacle Geese originating from this SPA as a result of the Proposed Project. The SPA is located approximately 10.7km from the Proposed Grid Connection Route and approx. 17.1km from the Proposed Wind Farm. Due to the large intervening distance between the Proposed Project and the SPA, there is no pathway for likely significant effect on the SCI species of this SPA due to ex-situ habitat loss, disturbance or collision risk. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Sligo/Leitrim Uplands SPA [004187] <u>Distances:</u> Proposed Wind Farm: 25.6km	➤ [A103] Peregrine <i>Falco peregrinus</i> ➤ [A346] Chough <i>Pyrrhocorax pyrrhocorax</i>	Detailed conservation objectives for this site, (Version 1, March 2025), were reviewed as part of the assessment and	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. Peregrine falcon exhibit a core foraging range of 2km during the breeding season, with maximum distances (recorded in Britain) of up to 18km (Scottish Natural Heritage, 2016). Although the Proposed Grid Connection Route is within the foraging range of Peregrine falcon, there is a paucity of suitable supporting habitat for the species	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
Proposed Grid Connection Route: 12.9km		are available at www.npws.ie	within the vicinity of the Proposed Grid Connection Route, which will be situated within existing road infrastructure. The SPA is separated from the Proposed Wind Farm by a significant intervening distance of 25.6km, which is outside of the foraging range for Peregrine. This SPA is internationally significant in terms of Chough. As per the site synopsis document (NPWS, 2015), Chough present within this SPA typically forage in areas of unimproved, closely grazed grassland which occurs on steep slopes below the cliffs of this SPA. The site synopsis document notes that the upland plateaus associated with this SPA are comprised of heath and blanket bog, which are largely unsuitable habitats for Chough. Given the availability of suitable supporting habitat within the vicinity of this SPA, and the significant intervening distance, it is unlikely that Chough are utilising the area around the Proposed Wind Farm, which largely comprises areas of unsuitable habitat. Chough were not identified within the immediate vicinity of the Proposed Wind Farm during the bird survey period April 2021-March 2025. In line with the rationale outlined above, there is no pathway for likely significant effect on the SCI species of this SPA due to ex-situ	

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
			habitat loss, disturbance or collision risk as a result of the Proposed Project. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	
Killala Bay/Moy Estuary SPA [004036] <u>Distances:</u> Proposed Wind Farm: 14.6 km Proposed Grid Connection Route: 16.4km	➤ [A137] Ringed Plover <i>Charadrius hiaticula</i> ➤ [A140] Golden Plover <i>Pluvialis apricaria</i> ➤ [A141] Grey Plover <i>Pluvialis squatarola</i> ➤ [A144] Sanderling <i>Calidris alba</i> ➤ [A149] Dunlin <i>Calidris alpina alpina</i> ➤ [A157] Bar-tailed Godwit <i>Limosa lapponica</i> ➤ [A160] Curlew <i>Numenius arquata</i> ➤ [A162] Redshank <i>Tringa totanus</i>	Detailed conservation objectives for this site, (Version 1, March 2013), were reviewed as part of the assessment and are available at www.npws.ie	There is no potential for direct effect as the Proposed Project is located completely outside of the European Designated Site. The Proposed Project and this European Designated Site are located within different hydrological subcatchments and groundwater bodies. There is no hydrological connectivity between the Proposed Project and the SPA and there is therefore no potential for likely significant effect to the SCI supporting wetland habitat. Two of the SCI species, namely Golden Plover and Dunlin, were recorded on Site. However, the mean foraging range for breeding Golden Plover is within a core range of 3km, maximum foraging distances can range up to 11km and 12km in the breeding and wintering season, respectively (SNH 2016, Gillings & Fuller 1999). Mean Foraging distances for Dunlin are limited to a core range of	No

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)	Conservation Objectives	Identification of Source-Pathway-Receptor chain	Potential for Likely Significant Effects (LSEs)
	 [A999] Wetlands		500m with a maximum range of 3km (SNH 2016). Due to the large intervening distance between the Proposed Project and the SPA, there is no pathway for likely significant effect on the SCI species of this SPA due to ex-situ habitat loss, disturbance or collision risk. 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 European Site is not within the Likely Zone of Influence of the Proposed Project. Therefore, it is not considered further in this assessment.	

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 European Sites:

- Ox Mountains Bogs SAC [002006]
- Ballysadare Bay SAC [000622]
- Unshin River SAC [001898]
- Ballysadare Bay SPA [004129]

As a result, an Appropriate Assessment is required and a Natura Impact Statement has been prepared in respect of the Proposed Project.

5.

INFORMATION TO INFORM APPROPRIATE ASSESSMENT

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:

- > Ox Mountains Bogs SAC [002006]
- > Ballysadare Bay SAC [000622]
- > Unshin River SAC [001898]
- > Ballysadare Bay SPA [004129]

The following sections consider each European Site individually to:

1. Determine which individual qualifying features have the potential to be adversely affected by the Proposed Project.
2. 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 Ox Mountains Bogs SAC

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

- The Proposed Wind Farm boundary directly overlaps with the boundary of the Ox Mountains Bog SAC at two locations. Furthermore, the western and southern boundary of the Proposed Wind Farm borders this European Site.
- A potential pathway for direct effect on the SAC was identified via loss of the QI habitats as a result of the Proposed Wind Farm, given that the boundary encompasses partial sections of this designated site.
- Furthermore, the potential for indirect effect to Geyer's whorl snail (*Vertigo geyeri*) via deterioration of supporting habitat was noted.
- A potential for adverse effect on the water quality of the QI lacustrine habitats of the SAC was identified as a result of water quality deterioration due to the Proposed Project.

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 potentially affected

Qualifying feature	Conservation Objective (NPWS, Version 1, September 2016 ¹⁰),	Rationale	Potential for Adverse Effects Yes/No
[1013] Geyer's Whorl Snail <i>Vertigo geyeri</i>	<i>To maintain the favourable conservation condition of Geyer's</i>	The existing known site for this species within the Ox Mountains Bog SAC is located within the northwest of the Proposed Wind Farm boundary. There are no	Yes

¹⁰ NPWS (2016) Conservation Objectives: Ox Mountains Bogs SAC 002006. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

Qualifying feature	Conservation Objective (NPWS, Version 1, September 2016 ¹⁰),	Rationale	Potential for Adverse Effects Yes/No
	<i>Whorl Snail in Ox Mountains Bogs SAC</i>	groundworks or construction works within 600m of the Geyer's Whorl Snail habitat. Only decommissioning works in the vicinity of the whorl snail habitat, which is located within the Existing Wind Farm are proposed. Taking a precautionary approach, there is potential for direct effect to this species via habitat loss or alteration during the construction phase of the Proposed Wind Farm, as a result of potential laydown areas of materials or machinery parked within the area of existing known habitat. Hydrological investigations conducted in preparation of Chapter 9 of the EIAR submitted with this planning application identified no perceptible changes to the groundwater table or surface water table beyond 10m of each turbine installation during construction, and no perceptible residual effect post-construction. There are no works associated with the Proposed Project that pose any risk of significant or perceptible hydrological alteration to the known area of habitat upon which the Geyer's whorl snail is dependent upon. As a result, there are no predicted potential indirect effects to this QI species of this SAC as a result of degradation of supporting habitat. A complete source-pathway-receptor chain for adverse effects on this QI was identified and it is assessed further in this NIS.	
[1528] Marsh Saxifrage <i>Saxifraga hirculus</i>	<i>To maintain the favourable conservation condition of Saxifraga hirculus in Ox Mountains Bogs SAC</i>	Marsh saxifrage is highly dependent upon mineral flush habitat within its highly limited distribution in Ireland (Muldoon, Waldren and Lynn, 2015), a habitat which itself is largely influenced and dictated by local hydrological conditions. Although there is Marsh Saxifrage present within the wider area of the Ox Mountains Bogs SAC, it is only known to occur in three areas of flush habitat, termed Flush A,	No

Qualifying feature	Conservation Objective (NPWS, Version 1, September 2016 ¹⁰),	Rationale	Potential for Adverse Effects Yes/No
		Flush B and Flush C in the Site-specific Conservation Objectives document. All three of these known areas of flush supporting Marsh saxifrage within the Ox Mountains Bogs SAC are outside of the boundary of the Proposed Wind Farm (Hodd, 2024), with a significant intervening distance of approx. 4km between the Site Boundary and these known areas of flush habitat. No Marsh saxifrage was identified during the dedicated botanical surveys undertaken within the Site Boundary. There is therefore no potential for indirect impacts on this species within the SAC during the construction and operational stage of the Proposed Wind Farm, as any associated potential hydrological alterations within the wider landscape will be imperceptible beyond the immediate 10m surrounding the turbine installations and only apparent during the construction phase. During the operational phase of the Proposed Wind Farm, the local groundwater levels and wetland water levels will return to baseline conditions and there will be no permanent alteration to the surrounding water table. Therefore, there is no potential for indirect effect to this species as a result of hydrological alterations during the operational phase of the Proposed Project. There are no works associated with the Proposed Project which have the potential for effect with regard to this species within this European site. Given the nature of the Proposed Project and the significant intervening distance between it and the areas of Marsh saxifrage where it occurs within this European Site, there is no potential for effect. No complete source- pathway- receptor chain for adverse effect on this QI as a result of the Proposed Project was identified. No further assessment is required.	
[3110] Oligotrophic waters containing very few	To maintain the favourable conservation condition of	Lacustrine habitats are present within the vicinity of the Proposed Wind Farm, predominantly within the boundary of Ox Mountains Bogs SAC.	Yes

Qualifying feature	Conservation Objective (NPWS, Version 1, September 2016 ¹⁰),	Rationale	Potential for Adverse Effects Yes/No
minerals of sandy plains (<i>Littorelletalia uniflorae</i>)	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) in Ox Mountains Bogs SAC	The Conservation Objectives for the Ox Mountains Bogs SAC maps potential Natural dystrophic lakes and ponds (3160) and/or Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) to the west of the Proposed Wind Farm and in the small Section 1270m east of T2 and T4 and 530m west of T9, and to the southwest of the Proposed Biodiversity Enhancement Area. Construction phase activities will require ground excavations, cement, tree felling, excavation dewatering, use of fuel powered machinery, all of which have potential to result in pollutive materials entering watercourses, and thus pose a potential degradation risk to this lacustrine Annex I habitat. A complete source-pathway-receptor chain for adverse effects on this QI was identified and it is assessed further in this NIS.	
[3160] Natural dystrophic lakes and ponds	<i>To maintain the favourable conservation condition of Natural dystrophic lakes and ponds in Ox Mountains Bogs SAC</i>	Lake habitats are present within the vicinity of the Proposed Wind Farm, predominantly within the Ox Mountains Bogs SAC. The Conservation Objectives for the Ox Mountains Bogs SAC maps potential Natural dystrophic lakes and ponds (3160) and/or Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) to the west of the Proposed Wind Farm and in the small Section 620m east of T2 and T4, and to the immediate southwest of the Proposed Biodiversity Enhancement Area. Construction phase activities will require ground excavations, cement, tree felling, excavation dewatering, use of fuel powered machinery, all of which have potential to result in pollutive materials entering watercourses, and thus pose a potential degradation risk to this lacustrine Annex I habitat.	Yes

Qualifying feature	Conservation Objective (NPWS, Version 1, September 2016 ¹⁰),	Rationale	Potential for Adverse Effects Yes/No
		A complete source-pathway-receptor chain for adverse effects on this QI was identified and it is assessed further in this NIS.	
[4010] Northern Atlantic wet heaths with <i>Erica tetralix</i>	<i>To restore the favourable conservation condition of Northern Atlantic wet heaths with Erica tetralix in Ox Mountains Bogs SAC</i>	The potential for direct effects on this QI habitat where it occurs within the SAC was considered. It is proposed to upgrade a section of the existing public road as part of the Proposed Wind Farm. This section of existing road to be upgraded borders an area of QI habitat mapped as containing between 20% and 60 % of this QI habitat in Map 4 of the SSCO¹¹ for an extent of approximately 860m. The proposed road upgrade is to the east of proposed T02 and T04. In the absence of mitigation, there is potential for this element of work to result in direct adverse effect on the QI habitat within the SAC. All other proposed infrastructure is over 100m from the SAC boundary. The potential for indirect effects on QI habitat within the SAC as a result of hydrological impacts and drainage associated with the Proposed Wind Farm also requires further assessment.	Yes
[4030] European dry heaths	<i>To maintain the favourable conservation condition of European dry heaths in Ox Mountains Bogs SAC</i>	The potential for direct effects on this QI habitat where it occurs within the SAC was considered. It is proposed to upgrade a section of the existing public road as part of the Proposed Wind Farm. This section of existing road to be upgraded borders an area of QI habitat mapped as containing between 0.1% and 20% of this QI habitat in Map 5 of the SSCO ¹² for an extent of approximately 860m. The proposed road	Yes

¹¹ https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002006.pdf

¹² https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002006.pdf

Qualifying feature	Conservation Objective (NPWS, Version 1, September 2016 ¹⁰),	Rationale	Potential for Adverse Effects Yes/No
		upgrade is to the east of proposed T02 and T04. In the absence of mitigation, there is potential for this element of work to result in direct adverse effect on the QI habitat within the SAC. All other proposed infrastructure is over 100m from the SAC boundary. The potential for indirect effects on QI habitat within the SAC as a result of hydrological impacts and drainage associated with the Proposed Wind Farm also requires further assessment.	
[7130] Blanket bogs (* if active bog)	<i>To restore the favourable conservation condition of Blanket bogs in Ox Mountains Bogs SAC</i>	The potential for direct effects on this QI habitat where it occurs within the SAC was considered. It is proposed to upgrade a section of the existing public road as part of the Proposed Wind Farm. This section of existing road to be upgraded borders an area of QI habitat mapped as containing between 60% and 100% of this QI habitat in Map 6 of the SSCO¹³ for an extent of approximately 860m. The proposed road upgrade is to the east of proposed T02 and T04. In the absence of mitigation, there is potential for this element of work to result in direct adverse effect on the QI habitat within the SAC. All other proposed infrastructure is over 100m from the SAC boundary. The potential for indirect effects on QI habitat within the SAC as a result of hydrological impacts and drainage associated with the Proposed Wind Farm also requires further assessment.	Yes

¹³ https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002006.pdf

Qualifying feature	Conservation Objective (NPWS, Version 1, September 2016 ¹⁴),	Rationale	Potential for Adverse Effects Yes/No
		A complete source-pathway-receptor chain for adverse effects on this QI was identified and it is assessed further in this NIS.	
[7140] Transition mires and quaking bogs	<i>To maintain the favourable conservation condition of Transition mires and quaking bogs in Ox Mountains Bogs SAC</i>	This habitat type was not identified within the Site Boundary during the surveying effort conducted in support of this NIS. Furthermore, the Site-specific Conservation Objectives document does not identify this habitat within the area of the Site Boundary which overlaps with this European Site (map 7, SSCO¹⁴). There is therefore no potential for indirect impacts on this habitat during the construction and operational stage of the Proposed Wind Farm, as any associated potential hydrological alterations within the wider landscape will be imperceptible beyond the immediate 10m surrounding the turbine installations during the construction phase. There are no works associated with the Proposed Project which have the potential for effect with regard to this habitat type within this European Site.	No
[7150] Depressions on peat substrates of the Rhynchosporion	<i>To maintain the favourable conservation condition of Depressions on peat substrates of the Rhynchosporion in Ox Mountains Bogs SAC</i>	The potential for direct effects on this QI habitat where it occurs within the SAC was considered. It is proposed to upgrade a section of the existing public road as part of the Proposed Wind Farm. This section of existing road to be upgraded borders an area of QI habitat mapped as containing between 0.1% and 20% of this QI habitat in Map 8 of the SSCO ¹⁵ for an extent of approximately 860m. The proposed road	Yes

¹⁴ https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002006.pdf

¹⁵ https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002006.pdf

Qualifying feature	Conservation Objective (NPWS, Version 1, September 2016 ¹⁰),	Rationale	Potential for Adverse Effects Yes/No
		upgrade is to the east of proposed T02 and T04. In the absence of mitigation, there is potential for this element of work to result in direct adverse effect on the <u>QI</u> habitat within the SAC. All other proposed infrastructure is over 100m from the SAC boundary. The potential for indirect effects on <u>QI</u> habitat within the SAC as a result of hydrological impacts and drainage associated with the Proposed Wind Farm also requires further assessment.	

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 European Site were reviewed and considered in relation to the Proposed Project. These are provided in Table 5-2 below.

Table 5-2. Site-specific threats, pressures and activities.

Negative Impacts			
Rank	Threats and Pressures		Inside/Outside
High	B01	Forest planting on open ground	Inside
High	C01.03.02	Mechanical removal of peat	Inside
High	C03.03	Wind energy production	Inside
High	L09	Fire (natural)	Inside
Low	D01.02	Roads, motorways	Both
Medium	A04	Grazing	Inside
Medium	C01.03.01	Hand cutting of peat	Inside
Medium	D05	Improved access to site	Inside

The Proposed Project represents a wind farm development, and as such falls under the potential site-specific threat of ‘wind energy production’ as listed in the Natura 2000 Data Form. Therefore, there is an associated potential pathway for effect with regard to site-specific activities in the form of wind energy production.

5.1.1.3 QI Species Specific Information

[1013] Geyer's Whorl Snail *Vertigo geyeri*

5.1.1.3.1 [1013] Geyer's Whorl Snail *Vertigo geyeri*

Geyer's whorl snail (*Vertigo geyeri*) is a Qualifying Interest (QI) of Ox Mountains Bogs SAC. A small section of the SAC boundary is located within the northwest of the Site Boundary, within the extent of the Existing Wind Farm (Dunneill Wind Farm). The location of the QI whorl snail population is identified in Map 9 of the Site-specific Conservation Objectives document for the SAC¹⁶. According to the document, the specified area, delineated by the SAC boundary, is the only known site for the species within the SAC. Suitable habitat is defined as *areas of flushed fen with small sedges and saturated mosses*. According to Moorkens and Killeen (2011) the population site is known by the designated code for condition assessment monitoring ‘VgCAM21’ and was surveyed during the whorl snail monitoring surveys 2008-2010. Appendix F of the manual includes high level condition assessment and management details of the site from 2010 surveys, which indicates that the habitat was in optimal condition and sheep grazed. The result of the monitoring surveys indicated, on a national scale, that negative pressures on the species likely include unsuitable grazing regimes, drainage, wind energy operations and commercial forestry.

¹⁶ https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002006.pdf

A more recent monitoring event conducted as part of a 2014-2017 surveying effort (Long and Brophy, 2019) assessed the impact of the Existing Wind Farms on the population and habitat of the VgCAM21 population in the interim period between the whorl snail monitoring surveys 2008-2010 and the more contemporary effort. This report highlighted that:

‘Wind energy production was noted as a negative by Moorkens & Killeen (2011). This relates to the Ox Mountains (VgCAM21) where turbines had very recently been installed adjacent to the V. geyeri habitat at the time of the previous survey. During the current survey, it was assessed that the siting of the turbines near the flush line has not, in fact, had a direct impact on the habitat, although some ancillary activities have been flagged.’

The report concluded, with reference to the Ox Mountains Bogs population of GWS, that no indication of a negative effect was apparent between the survey conducted prior to the construction of the Existing Wind Farm (2010 survey) and the survey conducted following the construction of the Existing Wind Farm (2016). Furthermore, the report recommends that this population of GWS, located within the Site Boundary, be designated as Favourable (green) status.

Description from SSCO document

The conservation objective for this QI is:

‘To maintain the favourable conservation condition of Geyer's Whorl Snail in Ox Mountains Bogs SAC’

The attributes and targets for this species are provided in Table 5-3 below.

Targets and Attributes

Table 5-3. Targets and Attributes.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Distribution: occupied sites	No decline. There is one known site for this species in this SAC within the 1km square G4429. See map 9	No - There is no infrastructure proposed within the known habitat areas for Geyer's whorl snail.
Presence in suitable habitat	Snails (living or recently dead adults and/or juveniles) are present in at least 60% of samples defined as suitable habitat	Yes - Although there is no infrastructure proposed within the known habitat area for Geyer's whorl snail, should this parcel be inadvertently utilised during the construction phase as a laydown area for materials or the parking of machinery, the presence of Geyer's whorl snail could be potentially impacted.
Species abundance	No decline in adult abundance in appropriate number of samples	Yes - There is no infrastructure proposed within the known habitat areas for Geyer's whorl snail. However, taking a precautionary approach, should there be access to the area or storage of materials within the area there is potential for the conservation objective to be undermined as a result of mortality.

Habitat area	Stable or increasing, subject to natural processes. Suitable habitat is defined as areas of flushed fen with small sedges and saturated mosses	No- There is no infrastructure proposed within the known habitat areas for Geyer's whorl snail.
Habitat quality: optimal habitat	At least 0.3ha of optimal habitat present	Yes- There is no infrastructure proposed within the known habitat areas for Geyer's whorl snail. However, taking a precautionary approach, should there be access to the area or storage of materials within the area there is potential for the conservation objective to be undermined as a result of mortality.
Habitat quality: soil wetness	Water table should be between 0-5cm of the soil surface, but not above ground level at time of sampling	No- Geyer's whorl snail is very susceptible to changes in hydrology. Changes in the groundwater table or water quality due to dewatering or pollution events could result in the loss of suitable habitat. However, the existing habitat for Geyer's whorl snail is located within an area of the existing Dunneill Wind Farm that will not be repowered, and only decommissioning turbine removal works are to be undertaken in this area. There are no groundworks required within 0.6km of the identified suitable habitat and as such no alterations to the soil wetness of the existing habitat is predicted.

5.1.1.4 QI Habitat Specific Information

- [3110] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
- [3160] Natural dystrophic lakes and ponds
- [7180] Blanket Bogs (* if active)
- [4010] Wet heath
- [4030] Dry heath
- [7150] Depressions on peat substrates of the Rhynchosporion

5.1.1.4.1 [3110] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)

Description from SSCO document

The conservation objective for this QI is:

*‘To maintain the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) in Ox Mountains Bogs SAC’*

The attributes and targets for this species are provided in the Table 5-4 below.

Targets and Attributes

Table 5-4. Targets and Attributes.

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	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Habitat distribution	No decline, subject to natural processes	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Typical species	Typical species present, in good condition, and demonstrating typical abundances and distribution	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation composition: characteristic zonation	All characteristic zones should be present, correctly distributed and in good condition	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation distribution: maximum depth	Maintain maximum depth of vegetation, subject to natural processes	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Hydrological regime: water level fluctuations	Maintain appropriate natural hydrological regime necessary to support the habitat	No- The Proposed Wind Farm will not result in any perceptible changes to the hydrological

		regime of the surrounding landscape, which includes this habitat type.
Lake substratum quality	Maintain appropriate substratum type, extent and chemistry to support the vegetation	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Water quality: transparency	Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Water quality: nutrients	Maintain the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Water quality: phytoplankton biomass	Maintain appropriate water quality to support the habitat, including high chlorophyll a status	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Water quality: phytoplankton composition	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Water quality: attached algal biomass	Maintain trace/ absent attached algal biomass (<5% cover) and high phytobenthos status	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Water quality: macrophyte status	Maintain high macrophyte status	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Acidification status	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants, including acidifying agents, could undermine this target.
Water colour	Maintain appropriate water colour to support the habitat	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Dissolved organic carbon (DOC)	Maintain appropriate organic carbon levels to support the habitat	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Turbidity	Maintain appropriate turbidity to support the habitat	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.

Fringing habitat: area	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110	No – There will be no alteration or loss of fringing habitat as a result of the Proposed Project.
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5.1.1.4.2 [3160] Natural dystrophic lakes and ponds

Description from SSCO document

The conservation objective for this QI is:

‘To maintain the favourable conservation condition of Natural dystrophic lakes and ponds in Ox Mountains Bogs SAC’

The attributes and targets for this habitat are provided in the Table 5-5 below.

Targets and Attributes

Table 5-5. Targets and Attributes.

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	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Habitat distribution	No decline, subject to natural processes	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Typical species	Typical species present, in good condition, and demonstrating typical abundances and distribution	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation composition: characteristic zonation	All characteristic zones should be present, correctly distributed and in good condition	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Vegetation distribution: maximum depth	Maintain maximum depth of vegetation, subject to natural processes	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Hydrological regime: water level fluctuations	Maintain appropriate natural hydrological regime necessary to support the habitat	No- The Proposed Wind Farm will not result in any perceptible changes to the hydrological regime of the surrounding landscape, which includes this habitat type

Lake substratum quality	Maintain appropriate substratum type, extent and chemistry to support the vegetation	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Water quality: transparency	Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Water quality: nutrients	Maintain the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Water quality: phytoplankton biomass	Maintain appropriate water quality to support the habitat, including high chlorophyll a status	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Water quality: phytoplankton composition	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Water quality: attached algal biomass	Maintain trace/ absent attached algal biomass (<5% cover) and high phytobenthos status	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Water quality: macrophyte status	Maintain high macrophyte status	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Acidification status	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants, including acidifying agents, could undermine this target.
Water colour	Maintain appropriate water colour to support the habitat	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Dissolved organic carbon (DOC)	Maintain appropriate organic carbon levels to support the habitat	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Turbidity	Maintain appropriate turbidity to support the habitat	Yes – On a precautionary basis, deterioration in water quality and associated habitat degradation as a result of silt-laden run-off and other pollutants could undermine this target.
Fringing habitat: area	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3160	No – There will be no alteration or loss of fringing habitat as a result of the Proposed Project.

5.1.1.4.3 [7130] Blanket bogs (* if active bog)

Description from SSCO document

The conservation objective for this QI is:

‘To maintain the favourable conservation condition of Blanket bogs in Ox Mountains Bogs SAC’

The attributes and targets for this habitat are provided in the Table 5-6 below.

Table 5-6. Attributes and targets for this habitat.

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	Yes – On a precautionary basis, upgrades to the road adjacent to this QI habitat could undermine this target.
Habitat distribution	No decline, subject to natural processes	Yes – On a precautionary basis, upgrades to the road adjacent to this QI habitat could undermine this target.
Ecosystem function: soil nutrients	Maintain soil nutrient status within natural range	No – There will be no alteration in the natural range of soil nutrients of this QI habitat as a result of the Proposed Project.
Ecosystem function: peat formation	At least 99% of the total Annex I blanket bog area is active	No – The Proposed Project will not affect the mechanism of peat formation of this QI habitat.
Ecosystem function: hydrology	Natural hydrology unaffected by drains and erosion	No- The Proposed Wind Farm will not result in any perceptible changes to the hydrological regime of the surrounding landscape, which includes this habitat type.
Community diversity	Maintain variety of vegetation communities, subject to natural processes	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: positive indicator species	Number of positive indicator species at each monitoring stop at least seven	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: lichens and bryophytes	Cover of bryophytes and lichens, excluding <i>Sphagnum fallax</i> , at least 10%	No – The Proposed Wind Farm will not result in any alterations to the assemblage of bryophytes or lichens associated with this habitat.
Vegetation composition: potential dominant species	Cover of each potential dominant species less than 75%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.

Vegetation composition: negative indicator species	Total cover of negative indicator species less than 1%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: nonnative species	Cover of non-native species less than 1%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: native trees and scrub	Cover of scattered native trees and shrubs less than 10%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation structure: Sphagnum condition	Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up	No – The Proposed Wind Farm will not result in any alterations to Sphagnum associated with this habitat.
Vegetation structure: signs of browsing	Last complete growing season's shoots of ericoids, crowberry (<i>Empetrum nigrum</i>) and bog-myrtle (<i>Myrica gale</i>) showing signs of browsing collectively less than 33%	No – The Proposed Wind Farm will not result in any alterations to the browsing regime taking place with regard to this habitat.
Vegetation structure: burning	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	No – The Proposed Wind Farm will not result in any potential burning on this QI habitat.
Physical structure: disturbed bare ground	Cover of disturbed bare ground less than 10%	No – The Proposed Wind Farm will not result in any significant increase in ground disturbance associated with this QI habitat.
Physical structure: drainage	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Yes – On a precautionary basis, upgrades to the road adjacent to this QI habitat could undermine this target.
Physical structure: erosion	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	No – The Proposed Wind Farm will not result in any increased erosion associated with this QI habitat.
Indicators of local distinctiveness	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	No – The Proposed Wind Farm will not result in any increased decline to rare, threatened or scarce species associated with this QI habitat.

5.1.1.4.4 [4030] European Dry Heath

Description from SSCO document

The conservation objective for this QI is:

'To maintain the favourable conservation condition of European Dry Heath in Ox Mountains Bogs SAC'

The attributes and targets for this habitat are provided in the Table 5-9 below.

Table 5-7. Attributes and targets for this habitat.

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	Yes – On a precautionary basis, upgrades to the road adjacent to this QI habitat could undermine this target.
Habitat distribution	No decline, subject to natural processes	Yes – On a precautionary basis, upgrades to the road adjacent to this QI habitat could undermine this target.
Ecosystem function: soil nutrients	Maintain soil nutrient status within natural range	No – There will be no alteration in the natural range of soil nutrients of this QI habitat as a result of the Proposed Project.
Community diversity	Maintain variety of vegetation communities, subject to natural processes	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: positive indicator species	Number of positive indicator species at each monitoring stop at least two	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: lichens and bryophytes	Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three, excluding Campylopus and Polytrichum mosse	No – The Proposed Wind Farm will not result in any alterations to the assemblage of bryophytes or lichens associated with this habitat.
Vegetation composition: cover of positive indicator species	Cover of positive indicator species at least 50% for siliceous dry heath and 50- 75% for calcareous dry heath	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: dwarf shrub composition	Proportion of dwarf shrub cover composed collectively of bog-myrtle (Myrica gale), creeping willow (Salix repens) and western gorse (Ulex gallii) is less than 50%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: negative indicator species	Total cover of negative indicator species less than 1%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: nonnative species	Cover of non-native species less than 1%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: native trees and scrub	Cover of scattered native trees and shrubs less than 20%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.

Vegetation composition: bracken	Cover of bracken (<i>Pteridium aquilinum</i>) less than 10%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: soft rush	Cover of soft rush (<i>Juncus effusus</i>) less than 10%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation structure: senescent ling	Senescent proportion of ling (<i>Calluna vulgaris</i>) cover less than 50%	No – The Proposed Wind Farm will not result in any alterations to the vegetation structure in this habitat.
Vegetation structure: signs of browsing	Less than 33% collectively of the last complete growing season's shoots of ericoids showing signs of browsing	No – The Proposed Wind Farm will not result in any alterations to the browsing regime taking place with regard to this habitat.
Vegetation structure: burning	No signs of burning in sensitive areas	No – The Proposed Wind Farm will not result in any potential burning on this QI habitat.
Vegetation structure: growth phases of ling	Outside sensitive areas, all growth phases of ling (<i>Calluna vulgaris</i>) should occur throughout, with at least 10% of cover in the mature phase	No – The Proposed Wind Farm will not result in any alterations to the vegetation structure in this habitat.
Physical structure: disturbed bare ground	Cover of disturbed bare ground less than 10%	No – The Proposed Wind Farm will not result in any significant increase in ground disturbance associated with this QI habitat.
Indicators of local distinctiveness	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.

5.1.1.4.5 [4010] Northern Atlantic wet heaths with *Erica tetralix*

Description from SSCO document

The conservation objective for this QI is:

*'To restore the favourable conservation condition of Northern Atlantic wet heaths with *Erica tetralix* in Ox Mountains Bogs SAC'*

The attributes and targets for this habitat are provided in the Table 5-98 below.

Table 5-8. Attributes and targets for this habitat.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Habitat area	Area increasing, subject to natural processes	Yes – On a precautionary basis, upgrades to the road adjacent to this QI habitat could undermine this target.

Habitat distribution	No decline, subject to natural processes	Yes – On a precautionary basis, upgrades to the road adjacent to this QI habitat could undermine this target.
Ecosystem function: soil nutrients	Maintain soil nutrient status within natural range	No – There will be no alteration in the natural range of soil nutrients of this QI habitat as a result of the Proposed Project.
Community diversity	Maintain variety of vegetation communities, subject to natural processes	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: cross-leaved heath	Cross-leaved heath (<i>Erica tetralix</i>) present near each monitoring stop	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: positive indicator species	Cover of positive indicator species at least 50%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: lichens and bryophytes	Total cover of <i>Cladonia</i> and <i>Sphagnum</i> species, <i>Racomitrium lanuginosum</i> and pleurocarpous mosses at least 10%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: ericoid species and crowberry	Cover of ericoid species and crowberry (<i>Empetrum nigrum</i>) at least 15%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: dwarf shrub species	Cover of dwarf shrubs less than 75%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: negative indicator species	Total cover of negative indicator species less than 1%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: nonnative species	Cover of non-native species less than 1%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: native trees and shrubs	Cover of scattered native trees and shrubs less than 20%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: bracken	Cover of bracken (<i>Pteridium aquilinum</i>) less than 10%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: soft rush	Cover of soft rush (<i>Juncus effusus</i>) less than 10%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.

Vegetation structure: Sphagnum condition	Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up	No – The Proposed Wind Farm will not result in any alterations to the vegetation structure in this habitat.
Vegetation structure: signs of browsing	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (<i>Empetrum nigrum</i>) and bog-myrtle (<i>Myrica gale</i>) showing signs of browsing	No – The Proposed Wind Farm will not result in any alterations to the vegetation structure in this habitat.
Vegetation structure: burning	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Yes – On a precautionary basis, upgrades to the road adjacent to this QI habitat could undermine this target.
Physical structure: disturbed bare ground	Cover of disturbed bare ground less than 10%	No – The Proposed Wind Farm will not result in any significant increase in ground disturbance associated with this QI habitat.
Physical structure: drainage	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	
Indicators of local distinctiveness	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.

5.1.1.4.6 [7150] Depressions of peat substrates of the *Rhynchosporion*

Description from SSCO document

The conservation objective for this QI is:

'To maintain the favourable conservation condition of Depressions on peat substrates of the Rhynchosporion in Ox Mountains Bogs SAC'

The attributes and targets for this habitat are provided in the Table 5-9 below.

Table 5-9. Attributes and targets for this habitat.

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	Yes – On a precautionary basis, upgrades to the road adjacent to this QI habitat could undermine this target.
Habitat distribution	No decline, subject to natural processes	Yes – On a precautionary basis, upgrades to the road adjacent to this QI habitat could undermine this target.
Ecosystem function: soil nutrients	Maintain soil nutrient status within natural range	No – There will be no alteration in the natural range of soil nutrients of this QI habitat as a result of the Proposed Project.

Vegetation composition: positive indicator species	Number of positive indicator species at each monitoring stop at least five	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: <i>Rhynchospora</i> spp.	Total cover of white beaked sedge (<i>Rhynchospora alba</i>) and brown beaked sedge (<i>R. fusca</i>) at least 10%	No – The Proposed Wind Farm will not result in any alterations to the assemblage of <i>Rhynchospora</i> associated with this habitat.
Vegetation composition: potential dominant species	Cover of each potential dominant species less than 35%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: negative indicator species	Total cover of negative indicator species less than 1%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: nonnative species	Cover of non-native species less than 1%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation composition: native trees and scrub	Cover of scattered native trees and shrubs less than 10%	No – The Proposed Wind Farm will not result in any alterations to the vegetation assemblage associated with this habitat.
Vegetation structure: Sphagnum condition	Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up	No – The Proposed Wind Farm will not result in any alterations to Sphagnum associated with this habitat.
Vegetation structure: signs of browsing	Last complete growing season's shoots of ericoids, crowberry (<i>Empetrum nigrum</i>) and bog-myrtle (<i>Myrica gale</i>) showing signs of browsing collectively less than 33%	No – The Proposed Wind Farm will not result in any alterations to the browsing regime taking place with regard to this habitat.
Vegetation structure: burning	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	No – The Proposed Wind Farm will not result in any potential burning on this QI habitat.
Physical structure: disturbed bare ground	Cover of disturbed bare ground less than 10%	No – The Proposed Wind Farm will not result in any significant increase in ground disturbance associated with this QI habitat.
Physical structure: drainage	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	No – The Proposed Wind Farm will not result in any increased drainage associated with this QI habitat.
Physical structure: erosion	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	No – The Proposed Wind Farm will not result in any increased erosion associated with this QI habitat.

Indicators of local distinctiveness	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	No – The Proposed Wind Farm will not result in any increased decline to rare, threatened or scarce species associated with this QI habitat.
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5.1.2 Ballysadare Bay SAC

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

- The Proposed Grid Connection Route is located within approx. 5m and 580m of this SAC at separate points. At both of these extents, there are mapped watercourses which are likely to provide hydrological connectivity between the Proposed Grid Connection Route and this European site.
- The Proposed Grid Connection Route has nine crossings located over watercourses which are hydrologically connected to the Ballysadare Bay SAC
- There is no hydrological connectivity between the Proposed Wind Farm and this European Designated Site. However, a potential for adverse effect on the water quality of the SAC was identified as a result of water quality deterioration due to the Proposed Grid Connection Route.

Table 5-10 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 5-10. Assessment of Qualifying features potentially affected.

Qualifying feature	Conservation Objective (NPWS, Version 1, November 2013 ¹⁷),	Rationale	Potential for Adverse Effects Yes/No
[1014] Narrow-mouthed Snail <i>Vertigo angustior</i>	<i>To maintain the favourable conservation condition of Narrow-mouthed Whorl Snail in Ballysadare Bay SAC</i>	The Narrow-mouthed whorl snail is a small mollusc which is known to inhabit marshy areas of coastal grassland within its range in Ireland. As per the Site-specific Conservation Document, <i>V. angustior</i> occupies a short peninsula located at the northwestern extent of this European site. This peninsula is separated from the Proposed Grid Connection Route by the estuarine area of Ballysadare Bay itself.	No

¹⁷ NPWS (2013) Conservation Objectives: Ballysadare Bay SAC 000622. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Qualifying feature	Conservation Objective (NPWS, Version 1, November 2013 ¹⁷),	Rationale	Potential for Adverse Effects Yes/No
		A previous monitoring effort of the Narrow-mouthed whorl snail within Ballysadare Bay SAC concluded that this site supported a good population of this species with extensive areas of suitable habitat present. This monitoring effort identified an adjacent golf course, blowouts and trampling as likely risks which could affect the population of <i>V. angustior</i> in the future (Long and Brophy, 2019). The Proposed Grid Connection Route is separated from the known site of Narrow-mouthed whorl snail within Ballysadare Bay SAC by a significant intervening distance of approx. 3km at the nearest point. There is therefore no potential for direct effect to this population, or its supporting habitat, as a result of the Proposed Project. The Proposed Project will not contribute to any of the identified pressures currently impacting this site as identified during the 2019 monitoring report. Furthermore, given the significant intervening distance and the assimilative capacity of the intervening coastal environment, there is no potential for indirect effect to this species via hydrological connectivity.	
[1130] Estuaries	<i>To maintain the favourable conservation condition of Estuaries in Ballysadare Bay SAC</i>	On a precautionary basis, given the small-scale nature of the water crossing works which are restricted to existing road infrastructure, there is potential for adverse effect on the QI [1130] estuarine habitat of this SAC has been identified via deterioration in water quality as a result of the Proposed Grid Connection Route.	Yes
[1140] Mudflats and sandflats not covered by seawater at low tide	<i>To maintain the favourable conservation condition of Mudflats and sandflats not</i>	On a precautionary basis, given the small-scale nature of the water crossing works which are restricted to existing road infrastructure, there is potential adverse effect on the QI [1140] habitat of this SAC has been identified via deterioration in water quality as a result of the Proposed Project.	Yes

Qualifying feature	Conservation Objective (NPWS, Version 1, November 2013 ¹⁷),	Rationale	Potential for Adverse Effects Yes/No
	<i>covered by seawater at low tide in Ballysadare Bay SAC</i>		
[1365] Harbour seal <i>Phoca vitulina</i>	<i>To maintain the favourable conservation condition of Harbour Seal in Ballysadare Bay SAC</i>	Given the small-scale nature of the works associated with the Proposed Grid Connection Route, there is no realistic pathway by which Harbour seal utilising the estuarine waters of Ballysadare Bay SAC could be impacted as a result of the Proposed Project.	No
[2110] Embryonic shifting dunes	<i>To maintain the favourable conservation condition of Embryonic shifting dunes in Ballysadare Bay SAC</i>	The mapped area of this habitat within the SAC is located on a peninsula located at the northwestern extent of this European site. The Proposed Grid Connection Route is separated from the known area of habitat within Ballysadare Bay SAC by a significant intervening distance of approx. 3km at the nearest point. There is therefore no potential for direct effect to this habitat as a result of the Proposed Project. Given the significant intervening distance and the terrestrial nature of this QI habitat, there is no potential for indirect effect to this QI habitat via hydrological connectivity.	No
[2120] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)	<i>To restore the favourable conservation condition of Shifting dunes along the shoreline with Ammophila arenaria ('white dunes') in Ballysadare Bay SAC</i>	The mapped area of this habitat within the SAC is located on a peninsula located at the northwestern extent of this European site. The Proposed Grid Connection Route is separated from the known area of habitat within Ballysadare Bay SAC by a significant intervening distance of approx. 3km at the nearest point. There is therefore no potential for direct effect to this habitat as a result of the Proposed Project.	No

Qualifying feature	Conservation Objective (NPWS, Version 1, November 2013 ¹⁷),	Rationale	Potential for Adverse Effects Yes/No
		Given the significant intervening distance and the terrestrial nature of this QI habitat, there is no potential for indirect effect to this QI habitat via hydrological connectivity.	
[2130] Fixed coastal dunes with herbaceous vegetation (grey dunes)	<i>To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation ('grey dunes') in Ballysadare Bay SAC</i>	The mapped area of this habitat within the SAC is located on a peninsula located at the northwestern extent of this European site. The Proposed Grid Connection Route is separated from the known area of habitat within Ballysadare Bay SAC by a significant intervening distance of approx. 3km at the nearest point. There is therefore no potential for direct effect to this habitat as a result of the Proposed Project. Given the significant intervening distance and the assimilative capacity of the intervening coastal environment, there is no potential for indirect effect to this coastal habitat via hydrological connectivity.	No
[2190] Humid dune slacks	<i>To restore the favourable conservation condition of Humid dune slacks in Ballysadare Bay SAC</i>	The mapped area of this habitat within the SAC is located on a peninsula located at the northwestern extent of this European site. The Proposed Grid Connection Route is separated from the known area of habitat within Ballysadare Bay SAC by a significant intervening distance of approx. 3km at the nearest point. There is therefore no potential for direct effect to this habitat as a result of the Proposed Project. Given the significant intervening distance and the terrestrial nature of this QI habitat, there is no potential for indirect effect to this QI habitat via hydrological connectivity.	No

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 European Site were reviewed and considered in relation to the Proposed Project. These are provided in Table 5-11 below.

Table 5-11. Site-specific threats, pressures and activities.

Negative Impacts			
Rank	Threats and Pressures		Inside/Outside
High	A04.03	Abandonment of pastoral systems, lack of grazing	Inside
Low	F01.03	Bottom culture	Inside
Low	G02.02	Skiing complex	Both
Low	I01	Invasive non-native species	Inside
Low	J02.01.02	Reclamation of land from sea, estuary or marsh	Inside
Low	J02.12.01	Sea defense or coast protection works, tidal barrages	Inside
Medium	E01.02	Discontinuous urbanisation	Outside
Medium	F02	Fishing and harvesting aquatic resources	Inside
Medium	G01.02	Walking, horseriding and non-motorised vehicles	Inside
Medium	G05.01	Trampling, overuse	Inside
Medium	K01.01	Erosion	Inside

No potential pathways for effect associated with the Proposed Project with regard to site-specific threats, pressures and activities were identified.

5.1.2.3 QI Habitat Specific Information

- > [1130] Estuaries
- > [1140] Mudflats and sandflats not covered by seawater at low tide

5.1.2.3.1 [1130] Estuaries

Description from SSCO document

The conservation objective for this QI is:

‘To maintain the favourable conservation condition of Estuaries in Ballysadare Bay SAC’

The attributes and targets for this species are provided in the Table 5-12 below.

Targets and Attributes

Table 5-12. Targets and Attributes.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Habitat area	The permanent habitat area is stable or increasing, subject to natural processes. See map 3	No – The Proposed Project will not result in any alterations to the habitat area of this site.
Community extent	Maintain the extent of the <i>Zostera</i> -dominated community, subject to natural processes. See map 5 of the Site-specific Conservation Objectives document (NPWS, 2013).	Yes - On a precautionary basis, there is potential for indirect alteration to the extent of <i>Zostera</i> beds within this SAC as a result of water quality deterioration associated with the construction of the Proposed Grid Connection Route.
Community structure: <i>Zostera</i> density	Conserve the high quality of the <i>Zostera</i> -dominated community, subject to natural processes	Yes - On a precautionary basis, there is potential for indirect alteration to the <i>Zostera</i> -dominated assemblage structure within this SAC as a result of water quality deterioration associated with the construction of the Proposed Grid Connection Route.
Community distribution	Conserve the following community types in a natural condition: Intertidal sand with <i>Angulus tenuis</i> community complex; Muddy sand to sand with <i>Hediste diversicolor</i> , <i>Corophium volutator</i> and <i>Peringia ulvae</i> community complex; Fine sand with polychaetes community complex; Sand with bivalves, nematodes and crustaceans community complex; Intertidal reef community complex; Subtidal reef community complex. See map 5 of the Site-specific Conservation Objectives document (NPWS, 2013).	Yes - On a precautionary basis, there is potential for indirect alteration to the composition of these assemblages as a result of water quality deterioration associated with the construction of the Proposed Grid Connection Route.

5.1.2.3.2 [1140] Mudflats and sandflats not covered by seawater at low tide

Description from SSCO document

The conservation objective for this QI is:

‘To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Ballysadare Bay SAC’

The attributes and targets for this species are provided in the Table 5-13 below.

Targets and Attributes

Table 5-13. Targets and Attributes.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
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Habitat area	The permanent habitat area is stable or increasing, subject to natural processes. See map 4 of the Site-specific Conservation Objectives document.	No – The Proposed Project will not result in any alterations to the habitat area of this site.
Community extent	Maintain the extent of the Zostera-dominated community, subject to natural processes. See map 5	Yes - On a precautionary basis, there is potential for indirect alteration to the Zostera-dominated assemblage structure within this SAC as a result of water quality deterioration associated with the construction of the Proposed Grid Connection Route
Community structure: Zostera dens	Conserve the high quality of the Zostera-dominated community, subject to natural processes	Yes - On a precautionary basis, there is potential for indirect alteration to the Zostera-dominated assemblage structure within this SAC as a result of water quality deterioration associated with the construction of the Proposed Grid Connection Route
Community distribution	Conserve the following community types in a natural condition: Intertidal sand with Angulus tenuis community complex; Muddy sand to sand with Hediste diversicolor, Corophium volutator and Peringia ulvae community complex.	Yes - On a precautionary basis, there is potential for indirect alteration to the Zostera-community distribution within this SAC as a result of water quality deterioration associated with the construction of the Proposed Grid Connection Route

5.1.3 Unshin River SAC

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

- The Proposed Wind Farm and this European Designated Site are located in separate hydrological subcatchments, with no hydrological connectivity between the two. There is no pathway for effect between the Proposed Wind Farm and this European Site.
- The Proposed Grid Connection Route has multiple crossings located over watercourses which form a component of the Unshin River SAC.
- Furthermore, the Proposed Grid Connection Route has five crossings located over watercourses which are hydrologically connected to the Unshin River SAC

Table 5-14 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 5-14. Assessment of Qualifying features potentially affected.

Qualifying feature	Conservation Objective (NPWS, Version 1, December 2021 ¹⁸),	Rationale	Potential for Adverse Effects Yes/No
[1106] Salmon <i>Salmo salar</i>	<i>To maintain the favourable conservation condition of Atlantic Salmon (Salmo salar) in Unshin River SAC</i>	Yes - The Proposed Grid Connection Route comprises small-scale works which are to be located within existing road infrastructure. No instream works are associated with the Proposed Grid Connection Route, and as such there is no potential for direct effect on the species or loss of supporting habitat. However, on a precautionary basis, the potential for runoff associated with the proposed works has the potential to indirectly affect this species via water quality deterioration, thus potentially undermining this conservation objective.	Yes

¹⁸ NPWS (2021) Conservation Objectives: Unshin River SAC 001898. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

Qualifying feature	Conservation Objective (NPWS, Version 1, December 2021 ¹⁸),	Rationale	Potential for Adverse Effects Yes/No
[1355] Otter <i>Lutra lutra</i>	<i>To maintain the favourable conservation condition of Otter (Lutra lutra) in Unshin River SAC</i>	Yes - The Proposed Grid Connection Route comprises small-scale works which are to be located within existing road infrastructure. No instream works are associated with the Proposed Grid Connection Route, and as such there is no potential for direct effect on the species or loss of supporting habitat. No evidence of otter holts or resting places were found during the dedicated otter surveys undertaken at watercourse crossings along the Proposed Grid Connection Route, however evidence of sprainting was observed at site D7 (Appendix 1) located on the Unshin River. On a precautionary basis, the potential for runoff associated with the proposed works has the potential to indirectly affect this species via water quality deterioration, which could impact prey availability, thus potentially undermining this conservation objective.	Yes
[3260] Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	<i>To maintain the favourable conservation condition of Water courses of plain to montane levels with the Ranunculus fluitantis and Callitriche-Batrachion vegetation in Unshin River SAC</i>	Yes - The Proposed Grid Connection Route comprises small-scale works which are to be located within existing road infrastructure. No instream works are associated with the Proposed Grid Connection Route, and as such there is no potential for direct effect on this habitat. On a precautionary basis, the potential for runoff associated with the proposed works has the potential to indirectly affect this habitat type via water quality deterioration, which could potentially undermine this conservation objective.	Yes
[6210] Semi-natural dry grasslands and scrubland facies on calcareous	<i>To restore the favourable conservation condition of Semi-natural dry grasslands and</i>	No- No pathway was identified through which this terrestrial habitat could be affected as a result of the Proposed Project.	No

Qualifying feature	Conservation Objective (NPWS, Version 1, December 2021 ¹⁸),	Rationale	Potential for Adverse Effects Yes/No
substrates (<i>Festuco-Brometalia</i>) (* important orchid sites)	<i>scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) in Unshin River SAC</i>		
[6410] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)	<i>To restore the favourable conservation condition of Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) in Unshin River SAC</i>	No- No pathway was identified through which this terrestrial habitat could be affected as a result of the Proposed Project.	No
[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>)*	<i>To restore the favourable conservation condition of Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* in Unshin River SAC</i>	Yes - The Proposed Grid Connection Route comprises small-scale works which are to be located within existing road infrastructure. No instream works are associated with the Proposed Grid Connection Route, and as such there is no potential for direct effect on this habitat. On a precautionary basis, the potential for runoff associated with the proposed works has the potential to indirectly affect this fluvial-dependent habitat type via water quality deterioration, which could potentially undermine this conservation objective.	Yes

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 5-15 below.

Table 5-15. Site-specific threats, pressures and activities.

Negative Impacts			
Rank	Threats and Pressures		Inside/Outside
High	I01	Invasive non-native species	Inside
Low	B02	Forest and Plantation management & use	Outside
Low	J02.10	Management of aquatic and bank vegetation for drainage purposes	Inside
Medium	A02.01	Agricultural intensification	Inside

No potential pathways for effect associated with the Proposed Project with regard to site-specific threats, pressures and activities were identified.

5.1.3.3 QI Species Specific Information

- > [1106] Salmon *Salmo salar*
- > [1355] Otter *Lutra lutra*

5.1.3.3.1 [1106] Salmon *Salmo salar*

Atlantic salmon (*Salmo salar*) are a listed QI species of the Unshin River SAC, which is crossed by the Proposed Grid Connection Route.

The Unshin River SAC is a component of the Owenmore system, otherwise known as the Ballysodare in its lower reaches, which is a known prominent salmon-bearing system (Kelly *et al.*, 2011). The Unshin river, which is a tributary of the Owenmore/ Ballysodare River, is one known tributary of the system which is utilised by Atlantic salmon (Kelly *et al.*, 2015).

The system is known to support a moderate abundance of adult Atlantic salmon, with 8,451 individuals having entered the Owenmore in the first 7-month period of 2024, as informed by fish counter data. The lower catchment was subject to a mortality event of an unconfirmed cause in late June/ early July 2024, which is estimated to have caused the mortality of approximately 12.8% of the stock to have entered the system during the aforementioned initial 7-month period of that year (Millane *et al.*, 2024).

Description from SSCO document

The conservation objective for this QI is:

*‘To maintain the favourable conservation condition of Atlantic Salmon (*Salmo salar*) in Unshin River SAC’*

The attributes and targets for this species are provided in the Table 5-16 below.

Targets and Attributes

Table 5-16. Targets and Attributes.

	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 Grid Connection Route cabling will be laid in existing bridge infrastructure, and no instream works are to take place.
Adult spawning fish	Conservation limit (CL) for each system consistently exceeded	Yes – The Proposed Grid Connection Route comprises small-scale works which are to be located within existing road infrastructure. No instream works are associated with the Proposed Grid Connection Route, and as such there is no potential for direct effect. However, on a precautionary basis, there is a risk of deterioration in water quality, including from siltation and enrichment risks, as a result of the Proposed Grid Connection Route. Both of these stressors have the potential to impact salmonid survivability and spawning success, and therefore have the potential to affect the number of adult salmon within the system.
Salmon fry abundance	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling	Yes – The Proposed Grid Connection Route comprises small-scale works which are to be located within existing road infrastructure. No instream works are associated with the Proposed Grid Connection Route, and as such there is no potential for direct effect. However, on a precautionary basis, there is a risk of deterioration in water quality, including from siltation and enrichment risks, as a result of the Proposed Grid Connection Route. Both of these stressors have the potential to impact salmonid survivability and spawning success, and therefore have the potential to affect the number of salmon fry within the system.
Out-migrating smolt abundance	No significant decline	Yes – The Proposed Grid Connection Route comprises small-scale works which are to be located within existing road infrastructure. No instream works are associated with the Proposed Grid Connection Route, and as such there is no potential for direct effect. However, on a precautionary basis, there is a risk of deterioration in water quality, including from siltation and enrichment risks, as a result of the Proposed Grid Connection Route. Both of these stressors have the potential to impact salmonid survivability and spawning success, and therefore have the potential to affect

		the number of out-migrating smolts within the system.
Number and distribution of redds	No decline in number and distribution of spawning redds due to anthropogenic causes	Yes – The Proposed Grid Connection Route comprises small-scale works which are to be located within existing road infrastructure. No instream works are associated with the Proposed Grid Connection Route, and as such there is no potential for direct effect. However, on a precautionary basis, there is a risk of deterioration in water quality, including from siltation and enrichment risks, as a result of the Proposed Grid Connection Route. Both of these stressors have the potential to impact salmonid survivability and spawning success, and therefore have the potential to affect the number of redds within the system.
Water quality	At least Q4 at all sites sampled by EPA	Yes – The Proposed Grid Connection Route comprises small-scale works which are to be located within existing road infrastructure. No instream works are associated with the Proposed Grid Connection Route, and as such there is no potential for direct effect. However, on a precautionary basis, there is a risk of deterioration in water quality, including from siltation and enrichment risks, as a result of the Proposed Grid Connection Route. Siltation and enrichment are both key stressors which can act to reduce the Q-value scoring of fluvial environments.

5.1.3.3.2 [1355] Otter *Lutra lutra*

The Eurasian otter (*Lutra lutra*) is a semi-aquatic mustelid with the widest known distribution of all otter species, ranging from Eastern Russia and China at its eastern extent to the island of Ireland at the western extent of its range (Yoxon and Yoxon, 2019). The otter, which is a listed species under Annex II and IV of the EU Habitats Directive, experienced a significant population decline throughout Europe in the 20th century, however some populations are thought to have undergone a period of re-expansion in recent years (Schenekar, Weiss and Weiss, 2023).

National surveying within Ireland indicates that although the otter has been observed to be well-distributed throughout the island in the previous 40 year period, it is likely that the population has experienced an overall decline since the 1980's, with the period of the 1990's and the 2000's seeing the most prominent changes to the national population (Reid *et al.*, 2025).

Otter is a designated QI species of the Unshin River SAC, which is crossed by the Proposed Grid Connection Route.

Description from SSCO document

The conservation objective for this QI is:

'To maintain the favourable conservation condition of Otter (Lutra lutra) in Unshin River SAC'

The attributes and targets for this species are provided in the Table 5-17 below.

Targets and Attributes

Table 5-17. Targets and Attributes.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Distribution	No significant decline	Yes – The Proposed Grid Connection Route comprises small-scale works which are to be located within existing road infrastructure. No instream works are associated with the Proposed Grid Connection Route, and as such there is no potential for direct effect. No evidence of otter holts or resting places were found during the dedicated otter surveys undertaken at watercourse crossings along the Proposed Grid Connection Route. However, on a precautionary basis, there is a risk of deterioration in water quality, including from siltation and enrichment risks, as a result of the Proposed Grid Connection Route, which could undermine this target by impacting the suitability of the fluvial environment of this SAC for otter.
Extent of terrestrial habitat	No significant decline. Area mapped and calculated as 124.68ha	No – the Proposed Project will not result in any reduction in otter habitat.
Extent of freshwater (river) habitat	No significant decline. Length mapped and calculated as 66.55km	No – the Proposed Project will not result in any reduction in otter habitat.
Couching sites and holts	No significant decline	No – the Proposed Project will not result in any reduction in couching sites and holts. No evidence of otter holts or resting places were found during the dedicated otter surveys undertaken at watercourse crossings along the Proposed Grid Connection Route.
Fish biomass available	No significant decline	Yes – The Proposed Grid Connection Route comprises small-scale works which are to be located within existing road infrastructure. No instream works are associated with the Proposed Grid Connection Route, and as such there is no potential for direct effect. However, on a precautionary basis, there is a risk of deterioration in water quality, including from siltation and enrichment risks, as a result of the Proposed Grid Connection Route. A deterioration in water quality has the potential to undermine this target.

Barriers to connectivity	No significant increase	No – The Proposed Project will not result in the creation or accentuation of any barriers to connectivity which could impact other within this SAC.
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5.1.3.4 QI Habitat Specific Information

- [3260] Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation
- [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

5.1.3.4.1 [3260] Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation

Description from SSCO document

The conservation objective for this QI is:

*“To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation in Unshin River SAC”*

The attributes and targets for this species are provided in the Table 5-18 below.

Targets and Attributes

Table 5-18. Targets and Attributes.

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	Yes – the mapped extent of this habitat as per the Site-specific Conservation Objectives document (NPWS, 2021) displays a mapped area of this habitat within the boundary of the Proposed Grid Connection Route. On a precautionary basis, there is potential for indirect effect which could undermine the area of this habitat as a result of water quality degradation associated with the Proposed Grid Connection Route.
Habitat distribution	No decline, subject to natural processes	No – The Proposed Project will not affect the distribution of this habitat.
Hydrological regime: river flow	Maintain appropriate hydrological regimes	No- There is no potential for alteration to the hydrological regime as a result of the Proposed Grid Connection Route.
Hydrological regime: groundwater discharge	Maintain appropriate hydrological regime	No – The Proposed Project will not affect the discharge of groundwater within the context of the functioning of this habitat.

Substratum composition: particle size range	Maintain appropriate substratum particle size range, quantity and quality, subject to natural processes	Yes – On a precautionary basis, there is potential for the substrate composition to be altered as a result of the Proposed Grid Connection Route crossings.
Water quality	Maintain/restore appropriate water quality to support the natural structure and functioning of the habitat	Yes – On a precautionary basis, there is potential for indirect effect via degradation to water quality as a result of runoff associated with the construction of the Proposed Grid Connection Route.
Typical species	Typical species of the relevant habitat sub-type should be present and in good condition	Yes – On a precautionary basis, there is potential for indirect effect via degradation to water quality as a result of runoff associated with the construction of the Proposed Grid Connection Route.
Floodplain connectivity: area	Maintain/restore the area of active floodplain at and upstream of the habitat	No – The Proposed Project will not result in any effect on the area of floodplain associated with this habitat type.
Riparian habitat: area and condition	Maintain the area and condition of fringing habitats necessary to support the habitat and its sub-types	No – There are no works associated with Riparian habitat, as all Proposed Grid Connection Route cabling is to be located within existing road/bridge infrastructure.

5.1.3.4.2 [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)*

Description from SSCO document

The conservation objective for this QI is:

*‘To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)* in Unshin River SAC’*

The attributes and targets for this species are provided in the Table 5-19 below.

Targets and Attributes

Table 5-19. Targets and Attributes.

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 – The Proposed Grid Connection Route will be located within existing road infrastructure, and as such this habitat will not be directly impacted where it occurs adjacent to the Proposed Project.
Habitat distribution	No decline, subject to natural processes. The surveyed woodland areas are shown on map 4	No – The Proposed Grid Connection Route will be located within existing road infrastructure, and as such this habitat will not be directly impacted where it occurs adjacent to the Proposed Project.
Woodland size	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	No – The Proposed Grid Connection Route will be located within existing road infrastructure, and as such this habitat will not be directly impacted where it occurs adjacent to the Proposed Project.
Woodland structure: cover and height	Total canopy cover at least 30%; median canopy height at least 7m; native shrub layer cover 10-75%; native herb/dwarf shrub layer cover at least 20% and height at least 20cm; bryophyte cover at least 4%	No – The Proposed Grid Connection Route will be located within existing road infrastructure, and as such this habitat will not be directly impacted where it occurs adjacent to the Proposed Project.
Woodland structure: community diversity and extent	Maintain diversity and extent of community types	Yes – On a precautionary basis, habitat degradation as a result of deterioration in water quality could undermine this target.
Woodland structure: natural regeneration	Seedlings, saplings and pole age-classes of target species for 91E0* woodlands and other native tree species occur in adequate proportions to ensure survival of woodland canopy	No – The Proposed Grid Connection Route will be located within existing road infrastructure, and as such this habitat will not be directly impacted where it occurs adjacent to the Proposed Project.

Hydrological regime: flooding depth/height of water table	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	No - the Proposed Grid Connection Route is not going to result in changes to flooding depth or height of water table.
Woodland structure: dead wood	At least 19 stems/ha of dead wood of at least 20cm diameter	No – The Proposed Grid Connection Route will be located within existing road infrastructure, and as such this habitat will not be directly impacted where it occurs adjacent to the Proposed Project.
Woodland structure: veteran trees	No decline	No – The Proposed Grid Connection Route will be located within existing road infrastructure, and as such this habitat will not be directly impacted where it occurs adjacent to the Proposed Project.
Woodland structure: indicators of local distinctiveness	No decline in distribution and, in the case of red listed and other rare or localised species, population size	No – The Proposed Grid Connection Route will be located within existing road infrastructure, and as such this habitat will not be directly impacted where it occurs adjacent to the Proposed Project.
Woodland structure: indicators of overgrazing	All five indicators of overgrazing absent	No – There will be no increased or additional risk of grazing or disturbance to this habitat as a result of the Proposed Project.
Vegetation composition: native tree cover	No decline. Native tree cover at least 90% of canopy; target species cover at least 50% of canopy	No – The Proposed Grid Connection Route will be located within existing road infrastructure, and as such this habitat will not be directly impacted where it occurs adjacent to the Proposed Project.
Vegetation composition: typical species	At least 1 target species for 91E0* woodlands present; at least 6 positive indicator species for 91E0* woodlands present	Yes – On a precautionary basis, habitat degradation as a result of deterioration in water quality could undermine this target
Vegetation composition: negative indicator species	Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent	Yes – On a precautionary basis, habitat degradation as a result of deterioration in water quality could undermine this target.
Vegetation composition: problematic native species	Cover of common nettle (<i>Urtica dioica</i>) less than 75%	Yes – On a precautionary basis, habitat degradation as a result of deterioration in water quality could undermine this target.

5.1.4 Ballysadare Bay SPA

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

- In addition to the SCI species for which Ballysadare Bay SPA is designated, consideration has also been given to other Annex I or regularly occurring migratory bird species that occur within the SPA (according to the NPWS Site Synopsis Document for the SPA). However, given the separation distance between the Proposed Wind Farm and Ballysadare SPA, no potential for adverse effect on any other species using the SPA was identified.
- The Proposed Wind Farm and this European Designated Site are located in separate hydrological subcatchments, with no hydrological connectivity between the two. There is no pathway for effect between the Proposed Wind Farm and this European Site.
- The Proposed Grid Connection Route has nine crossings located over watercourses which are hydrologically connected to the Ballysadare Bay SPA

Table 5-20 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 5-20. Assessment of Qualifying features potentially affected.

Special Conservation Interest	Conservation Objective (NPWS, Version 1, October 2013 ¹⁹),	Rationale	Potential for Adverse Effects Yes/No
[A046] Light-bellied Brent Goose <i>Branta bernicla hrota</i>	<i>To maintain the favourable conservation condition of Light-bellied Brent Goose in Ballysadare Bay SPA</i>	Ballysadare Bay SPA is of high ornithological value for Brent goose (<i>Branta bernicla hrota</i>), hosting a wintering population of the species which is of international importance (NPWS, 2010). The Proposed Wind Farm is located approx. 10.4km over-land from the SPA. The Proposed Wind Farm is outside of the core foraging range of this species (8.2km,	Yes

¹⁹ NPWS (2013) Conservation Objectives: Ballysadare Bay SPA 004129. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Special Conservation Interest	Conservation Objective (NPWS, Version 1, October 2013 ¹⁹),	Rationale	Potential for Adverse Effects Yes/No
		(Summers and Critchley, 1990). Therefore, there is no potential for adverse effect on the species as a result of collision or ex-situ disturbance/displacement. There is also no potential for such effects as a result of the Proposed Grid Connection Route. However, a potential for adverse effect on the species has been identified via deterioration in water quality of SCI supporting habitat as a result of the Proposed Project, specifically in relation to hydrological connectivity between the Proposed Grid Connection Route and Ballysadare Bay SPA.	
[A141] Grey Plover <i>Pluvialis squatarola</i>	<i>To maintain the favourable conservation condition of Grey plover in Ballysadare Bay SPA</i>	The Proposed Wind Farm is located approx. 10.4km over-land from the SPA. The Grey plover is a coastal-foraging wintering species that is not known to breed in Ireland. The site of the Proposed Wind Farm does not support suitable Grey plover foraging habitat, and it is unlikely that Grey plover utilise the site of the Proposed Wind Farm. Therefore, there is no potential for adverse effect on the species as a result of collision or ex-situ disturbance/displacement. There is also no potential for such effects as a result of the Proposed Grid Connection Route. However, a potential for adverse effect on the species has been identified via deterioration in water quality of SCI supporting habitat as a result of the Proposed Project, specifically in relation to hydrological connectivity between the Proposed Grid Connection Route and Ballysadare Bay SPA.	Yes
[A149] Dunlin <i>Calidris alpina alpina</i>	<i>To maintain the favourable conservation condition of Dunlin in Ballysadare Bay SPA</i>	The Proposed Wind Farm is located approx. 10.4km over-land from the SPA. This is outside of the core foraging range for this species (0.5 - 3km, SNH 2016). Therefore, there is no potential for adverse effect on the population within this SPA as a result of	Yes

Special Conservation Interest	Conservation Objective (NPWS, Version 1, October 2013 ¹⁹),	Rationale	Potential for Adverse Effects Yes/No
		collision or ex-situ disturbance/displacement. There is also no potential for such effects as a result of the Proposed Grid Connection Route. However, a potential for adverse effect on the species has been identified via deterioration in water quality of SCI supporting habitat as a result of the Proposed Project, specifically in relation to hydrological connectivity between the Proposed Grid Connection Route and Ballysadare Bay SPA.	
[A157] Bar-tailed Godwit <i>Limosa lapponica</i>	<i>To maintain the favourable conservation condition of Bar-tailed Godwit in Ballysadare Bay SPA</i>	The Proposed Wind Farm is located approx. 10.4km over-land from the SPA. Bar-tailed godwit were observed at two coastal locations within the wider vicinity of the Proposed Wind Farm during the ornithological surveying effort, with the nearest record being approximately 4.9km from the Proposed Wind Farm. The species was not observed within the immediate vicinity (~500m) of the Proposed Wind Farm site throughout the multi-year survey effort conducted between April 2021 and March 2025. Bar-tailed godwit are a coastal-associated species and are unlikely to utilise the site of the Proposed Wind Farm and its immediate surrounding area. Therefore, there is no potential for adverse effect on the population within this SPA as a result of collision or ex-situ disturbance/displacement. There is also no potential for such effects as a result of the Proposed Grid Connection Route. However, a potential for adverse effect on the species has been identified via deterioration in water quality of SCI supporting habitat as a result of the Proposed Project, specifically in relation to hydrological connectivity between the Proposed Grid Connection Route and Ballysadare Bay SPA.	Yes
[A162] Redshank <i>Tringa totanus</i>	<i>To maintain the favourable conservation condition of</i>	The Proposed Wind Farm is located approx. 10.4km over-land from the SPA. This species was not observed during the full entirety of the four winter and breeding	Yes

Special Conservation Interest	Conservation Objective (NPWS, Version 1, October 2013 ¹⁹),	Rationale	Potential for Adverse Effects Yes/No
	<i>Redshank in Ballysadare Bay SPA</i>	seasons in the period 2021-2025 during which ornithological surveys of the Proposed Wind Farm site were conducted. Furthermore, this species is primarily a coastal-associated species in Ireland, with some birds utilising lakes and rivers for foraging. There is limited suitable habitat for the species within the Proposed Wind Farm site, and its immediate surroundings. Therefore, there is no potential for adverse effect on the species as a result of collision or ex-situ disturbance/displacement. There is also no potential for such effects as a result of the Proposed Grid Connection Route. However, a potential for adverse effect on the species has been identified via deterioration in water quality of SCI supporting habitat as a result of the Proposed Grid Connection Route, due to the numerous watercourse crossings, which are located over watercourses which are hydrologically connected to this European Designated Site.	
[A999] Wetlands	<i>To maintain the favourable conservation condition of the wetland habitat in Ballysadare Bay SPA as a resource for the regularly-occurring migratory waterbirds that utilise it</i>	A potential for adverse effect on the species has been identified via deterioration in water quality of SCI supporting habitat as a result of the Proposed Grid Connection Route, due to the numerous watercourse crossings, which are located over watercourses which are hydrologically connected to this European Designated Site.	Yes

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 the European Site were reviewed and considered in relation to the Proposed Project. These are provided in Table 5-21 below.

Table 5-21. Site-specific threats, pressures and activities.

Negative Impacts			
Rank	Threats and Pressures		Inside/Outside
Low	F01	Marine and Freshwater Aquaculture	Inside
Medium	A08	Fertilisation	Outside
Medium	E01.01	Continuous urbanisation	Outside
Medium	F03.01	Hunting	Inside

No potential pathways for effect associated with the Proposed Project with regard to site-specific threats, pressures and activities were identified.

5.1.4.3 Special Conservation Interests' Specific Information

5.1.4.3.1 [A046] Brent Goose *Branta bernicla hrota*

Description from SSCO document

The conservation objective for this SCI is:

'To maintain the favourable conservation condition of Light-bellied Brent Goose in Ballysadare Bay SPA'

The attributes and targets for this species are provided in Table 5-20 below.

Targets and Attributes

Table 5-22 Targets and Attributes.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Population trend	Long term population trend stable or increasing	No – there is not likely to be potential for long term population trend changes as a result of the Proposed Project.
Distribution	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	Yes – taking a precautionary approach, there is a potential for effect on distribution of the species due to water quality deterioration of supporting habitat as a result of the Proposed Grid Connection Route.

5.1.4.3.2 [A141] Grey Plover *Pluvialis squatarola*

Description from SSCO document

The conservation objective for this SCI is:

‘To maintain the favourable conservation condition of Grey plover in Ballysadare Bay SPA’

The attributes and targets for this species are provided in the Table 5-23 below.

Targets and Attributes

Table 5-23. Targets and Attributes.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Population trend	Long term population trend stable or increasing	No – there is no potential for changes to the long term population trend as a result of the Proposed Project.
Distribution	No significant decrease in the range, timing and intensity of use of areas by grey plover, other than that occurring from natural patterns of variation	Yes – taking a precautionary approach, there is a potential for effect on distribution of the species due to water quality deterioration of supporting habitat as a result of the Proposed Grid Connection Route.

5.1.4.3.3 [A149] Dunlin *Calidris alpina alpina*

Description from SSCO document

The conservation objective for this SCI is:

‘To maintain the favourable conservation condition of Grey plover in Ballysadare Bay SPA’

The attributes and targets for this species are provided in the Table 5-24 below.

Targets and Attributes

Table 5-24. Targets and Attributes.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Population trend	Long term population trend stable or increasing	No – there is no potential for changes to the long term population trend as a result of the Proposed Project.
Distribution	No significant decrease in the range, timing and intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	Yes – there is potential to undermine this target as a result of deterioration in water quality associated with the Proposed Grid Connection Route.

5.1.4.3.4 [A157] Bar-tailed Godwit *Limosa lapponica*

Description from SSCO document

The conservation objective for this SCI is:

‘To maintain the favourable conservation condition of Bar-tailed Godwit in Ballysadare Bay SPA’

The attributes and targets for this species are provided in the Table 5-25 below.

Targets and Attributes

Table 5-25. Targets and Attributes.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Population trend	Long term population trend stable or increasing	No – there is no potential for changes to the long term population trend as a result of the Proposed Project.
Distribution	No significant decrease in the range, timing and intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation	Yes – there is potential to undermine this target as a result of deterioration in water quality associated with the Proposed Grid Connection Route.

5.1.4.3.5 [A162] Redshank *Tringa totanus*

Description from SSCO document

The conservation objective for this SCI is:

‘To maintain the favourable conservation condition of Redshank in Ballysadare Bay SPA’

The attributes and targets for this species are provided in the Table 5-26 below.

Targets and Attributes

Table 5-26. Targets and Attributes.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Population trend	Long term population trend stable or increasing	No – there is no potential for changes to the long term population trend as a result of the Proposed Project.
Distribution	No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	Yes – there is potential to undermine this target as a result of deterioration in water quality associated with the Proposed Grid Connection Route.

5.1.4.3.6 [A999] Wetlands

Ballysadare Bay SPA is a site of international importance for wintering Brent Geese and a site of national importance for a number of other wintering populations. The E.U. Birds Directive pays

particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest. Potential indirect effects on the supporting wetland habitat of waterbirds within the SPA in the form of degradation of surface water quality was identified.

Description from SSCO document

The conservation objective for this SCI is:

'To maintain the favourable conservation condition of the wetland habitat in Ballysadare Bay SPA as a resource for the regularly-occurring migratory waterbirds that utilise it'

The attributes and targets for this species are provided in the Table 5-27 below.

Targets and Attributes

Table 5-27. Targets and Attributes.

Attribute	Target	Potential for Proposed Project to Undermine Conservation Objective Target in the Absence of Mitigation
Habitat area	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2130 hectares, other than that occurring from natural patterns of variation	No – there is no potential for loss of wetland habitat area as a result of the Proposed Project. However, the potential for indirect effects to SCI supporting habitat as a result of water quality deterioration are considered further.

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 Sites. The Conservation Objectives each of the European Sites assessed were reviewed on the 10/06/2026. The Conservation Objectives for these sites are available at the following locations:

Ox Mountains Bog SAC 002006:

➤ https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002006.pdf

Ballysadare Bay SAC 000622:

➤ https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000622.pdf

Unshin River SAC 001898:

➤ https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001898.pdf

Ballysadare Bay SPA 004129:

➤ https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004129.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

The Proposed Project is located partially within the boundary of Ox Mountains Bogs SAC 002006. A small section of the SAC boundary is located within the northwest of the Site Boundary, within the Existing Wind Farm (Dunneil). This small area hosts the Qualifying Interest population of Geyer's whorl snail (*Vertigo geyeri*).

An area of existing road which is proposed to be widened westwards borders an area of the Ox Mountains Bogs SAC along 820m in the east which is mapped as hosting the QI peatland habitats including Blanket Bog, European Dry Heath, Northern Atlantic wet heaths with *Erica tetralix* and Depressions on peat substrates of the Rhynchosporion.

6.1.1

Geyers Whorl Snail

6.1.1.1

Direct Habitat Loss

There is no infrastructure or groundworks proposed within 600. of the known habitat area for Geyer's whorl snail which is a Qualifying Interest of Ox Mountains Bogs SAC.

As discussed in Section 3.3.2.3, the lack of sub-optimal to optimal habitat for the species within the vicinity of the footprint of the Proposed Wind Farm means there is no potential for fragmentation or loss of suitable habitat for the species. Similarly, there is no potential for mortality of the species as a result of the Proposed Project.

However, there is potential for effect to the supporting habitat for this species if the parcel of land in which Geyer's whorl snail inhabits is inadvertently accessed and utilised as a set-down and/or storage area for materials during the construction phase of the Proposed Project.

Mitigation

The Proposed Wind Farm infrastructure has been designed to avoid the area of Geyer's whorl snail habitat.

In addition, the following measures will be in place:

- In advance of construction of the Proposed Wind Farm, the Project Ecologist/ ECoW will ensure there is fencing surrounding the habitat and that there is no possibility of access to the area, or any storage of materials.
- Site workers will be fully briefed on the sensitivity of the habitat.
- Signage will be installed on the fences outlining that no access or placement of materials is permitted.
- The area will be checked by the site ECoW periodically during the decommissioning of the existing Duneill Wind Farm to ensure compliance with the prescribed mitigations.

Residual Effect Following Mitigation

Following the implementation of the above prescribed mitigation, there is no potential for residual adverse effect to Geyer's whorl snail as a result of direct habitat loss associated with the Proposed Project.

6.1.2 QI Peatland Habitats

6.1.2.1 Direct Habitat Loss – Encroachment of Roadways

An area of existing road which is proposed to be upgraded borders an area of the Ox Mountains Bogs SAC along 860m in along the eastern side of the road, detailed drawings of the road are shown in **Appendix 4**.

Existing roads which require upgrading will comprise widening of the roadway to a total running width of approximately five metres, with wider sections at corners and the laying of a new surface dressing on the existing section of roadway where necessary.

The general construction methodology for upgrading of existing sections of access roads or tracks is summarised below.

8. *Access track construction will be to the line and level requirements as per design and the turbine suppliers requirements*
9. *For upgrading of existing excavated access tracks (Type A) the following guidelines will be implemented in full :*
 - a. *Excavation of the widened section of access track will take place to a competent stratum beneath the peat (as agreed with the designer) and backfilled with suitable granular fill.*
 - b. *Benching of the excavation may be required between the existing section of access track and the widened section of access track where the depth of excavation required exceeds 500mm.*
 - c. *The surface of the existing access track will be overlaid with up to 150mm of selected granular fill.*

- d. *Access tracks will be finished with a layer of capping across the full width of the track.*
 - e. *A layer of geogrid/geotextile may be required at the surface of the existing access track and at the base of the widened section of access road (to be confirmed by the designer).*
 - f. *For excavations in peat, side slopes will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction. Where areas of weaker peat are encountered then slacker slopes will be required to ensure stability.*
 - g. *A section of upgraded road runs adjacent to Borrow Pit 1. At this location a 1m high safety berm will be constructed between the road and the borrow pit excavation.*
10. *For upgrading of existing access tracks constructed using a floated construction technique (Type B) the following will apply:*
- a. *Prior to commencing floating road construction movement monitoring posts will be installed in areas where the peat depth is greater than 2m.*
 - b. *Construction of road will be in accordance with appropriate design from the designer.*
 - c. *The surface of the existing access track should be graded/tidied up prior to the placement any geogrid/geotextile, where necessary (to prevent damaging the geogrid/geotextile).*
 - d. *Where granular fill has been used in the existing access track make-up, a layer of geogrid should be placed on top of the existing access track, extending to the full width of the proposed road.*
 - e. *The geogrid will be overlaid with an average of 800mm of selected granular fill on the widened sections of the floating access road.*
 - f. *Additional geogrid and granular fill may be required in certain sections of the works, such as where excessive rutting is noted in the existing track (to be confirmed by the designer).*
 - g. *Stone delivered to the floating road construction will be end-tipped onto the constructed floating road. Direct tipping of stone onto the peat will not be carried out.*
 - h. *To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating road will be tipped over at least a 10m length of constructed floating road.*
 - i. *Following the detailed design of the floated access roads it may be deemed necessary to include pressure berms either side of the access road in some of the deeper peat areas. The inclusion of a 2 to 5m wide pressure berm (typically 0.5m in height) either side of the access road will reduce the likelihood of potential bearing failures beneath the access road.*
 - j. *Following end-tipping suitable machinery will be employed to spread and place the tipped stone over the base geogrid along the line of the road.*
11. *The finished access trackwidth will have a running width of 5m, with wider sections on bends and corners.*
12. *On side long sloping ground any access track widening works required will be done on the upslope side of the existing access track, where possible.*
13. *A final surface layer shall be placed over the existing access track, as per design requirements, to provide a road profile and graded to accommodate wind turbine construction and delivery traffic.*
14. *At transitions between new floating and existing excavated roads a length of about 10 to 20m will have all peat excavated and replaced with suitable fill. The surface of this fill will be graded to accommodate wind turbine construction and delivery traffic.*
15. *The construction of access roads in areas of deep peat (greater than 2m) will be inspected on a routine basis (by the Site Manager/Ecological Clerk of Works/Project*

Geotechnical Engineer) during the works, particularly before/after trafficking by heavy vehicular loads.

Although there is a proposed widening of the existing public road to facilitate a final running width of 5 metres, the design of the proposed road upgrade at this location fully avoids encroachment into Ox Mountains Bogs SAC and its QI peatland habitats Northern Atlantic wet heaths with *Erica tetralix*, European dry heaths, Blanket bogs (* if active bog) and Depressions on peat substrates of the Rhynchosporion. All works adjacent to the SAC boundary at this location will occur on the western side of the public road. Road widening works will extend to the western side of this existing road, and as such there will be no encroachment on the Peatland Habitats of this SAC.

Mitigations

The proposed upgrades to the public road have been designed to avoid the area of QI Peatland habitat and all road upgrade works will occur to the west of the existing road only.

In addition, the following measures will be in place:

- There will be no excavation or stockpiling or storage of construction materials within habitat to the east of the existing road Site workers will be fully briefed on the sensitivity of the habitat
- The upgrade of the existing road will be supervised by an ECoW to ensure the listed mitigations are implemented

Residual Effect

There is no potential for residual adverse effect to the QI Peatland habitats of the Ox Mountains Bogs SAC via direct habitat loss as a result of encroachment associated with road widening as a component of the Proposed Wind Farm.

6.2 Potential for Indirect Effects on the European Sites

6.2.1 QI Peatland Habitats

6.2.1.1 Indirect Habitat Loss- Hydrological Alteration

An area of existing road which is proposed to be upgraded borders an area of the Ox Mountains Bogs SAC along 860m in along the eastern side of the road, detailed drawings of the road are shown in Appendix 4.

Existing roads which require upgrading will comprise widening of the roadway to a total running width of approximately five metres, with wider sections at corners and the laying of a new surface dressing on the existing section of roadway where necessary.

The general construction methodology for upgrading of existing sections of access roads or tracks is summarised below.

16. *Access track construction will be to the line and level requirements as per design and the turbine suppliers requirements*
17. *For upgrading of existing excavated access tracks (Type A) the following guidelines will be implemented in full :*
 - h. *Excavation of the widened section of access track will take place to a competent stratum beneath the peat (as agreed with the designer) and backfilled with suitable granular fill.*
 - i. *Benching of the excavation may be required between the existing section of access track and the widened section of access track where the depth of excavation required exceeds 500mm.*
 - j. *The surface of the existing access track will be overlaid with up to 150mm of selected granular fill.*
 - k. *Access tracks will be finished with a layer of capping across the full width of the track.*
 - l. *A layer of geogrid/geotextile may be required at the surface of the existing access track and at the base of the widened section of access road (to be confirmed by the designer).*
 - m. *For excavations in peat, side slopes will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction. Where areas of weaker peat are encountered then slacker slopes will be required to ensure stability.*
 - n. *A section of upgraded road runs adjacent to Borrow Pit 1. At this location a 1m high safety berm will be constructed between the road and the borrow pit excavation.*
18. *For upgrading of existing access tracks constructed using a floated construction technique (Type B) the following will apply:*
 - k. *Prior to commencing floating road construction movement monitoring posts will be installed in areas where the peat depth is greater than 2m.*
 - l. *Construction of road will be in accordance with appropriate design from the designer.*
 - m. *The surface of the existing access track should be graded/tidied up prior to the placement any geogrid/geotextile, where necessary (to prevent damaging the geogrid/geotextile).*
 - n. *Where granular fill has been used in the existing access track make-up, a layer of geogrid should be placed on top of the existing access track, extending to the full width of the proposed road.*

- o. *The geogrid will be overlaid with an average of 800mm of selected granular fill on the widened sections of the floating access road.*
 - p. *Additional geogrid and granular fill may be required in certain sections of the works, such as where excessive rutting is noted in the existing track (to be confirmed by the designer).*
 - q. *Stone delivered to the floating road construction will be end-tipped onto the constructed floating road. Direct tipping of stone onto the peat will not be carried out.*
 - r. *To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating road will be tipped over at least a 10m length of constructed floating road.*
 - s. *Following the detailed design of the floated access roads it may be deemed necessary to include pressure berms either side of the access road in some of the deeper peat areas. The inclusion of a 2 to 5m wide pressure berm (typically 0.5m in height) either side of the access road will reduce the likelihood of potential bearing failures beneath the access road.*
 - t. *Following end-tipping suitable machinery will be employed to spread and place the tipped stone over the base geogrid along the line of the road.*
- 19. *The finished access trackwidth will have a running width of 5m, with wider sections on bends and corners.*
 - 20. *On side long sloping ground any access track widening works required will be done on the upslope side of the existing access track, where possible.*
 - 21. *A final surface layer shall be placed over the existing access track, as per design requirements, to provide a road profile and graded to accommodate wind turbine construction and delivery traffic.*
 - 22. *At transitions between new floating and existing excavated roads a length of about 10 to 20m will have all peat excavated and replaced with suitable fill. The surface of this fill will be graded to accommodate wind turbine construction and delivery traffic.*
 - 23. *The construction of access roads in areas of deep peat (greater than 2m) will be inspected on a routine basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works, particularly before/after trafficking by heavy vehicular loads.*

All other proposed infrastructure is over 100m from the SAC boundary. According to the Peatland Code (IUCN 2023)²⁰, peatland is considered ‘drained’ if it is within 30m of an artificial drain or a natural drain formed by the presence of a hagg and gully.

In the absence of mitigation, there is potential for this element of work to result in direct adverse effect on the QI peatland habitat within the SAC.

Mitigations

The proposed upgrades to the public road have been designed to avoid the area of QI Peatland habitat and all road upgrade works will occur to the west of the existing road only.

In addition, the following measures will be in place:

- There will be no excavation or stockpiling or storage of construction materials within habitat to the east of the existing road Site workers will be fully briefed on the sensitivity of the habitat

^{20 20} https://www.iucn-uk-peatlandprogramme.org/sites/default/files/2023-03/Peatland%20Code%20V2%20-%20FINAL%20-%20WEB_2.pdf

- The upgrade of the existing road will be supervised by an ECoW to ensure the listed mitigations are implemented

Residual Effect

There is no potential for residual adverse effect to the QI Peatland habitats of the Ox Mountains Bogs SAC via direct habitat loss as a result of encroachment associated with road widening as a component of the Proposed Wind Farm.

6.2.2 Geyer's Whorl Snail

6.2.2.1 Indirect Habitat Loss- Hydrological Alteration

Geyer's whorl snail is very susceptible to changes in hydrology. Changes in the groundwater table or water quality due to dewatering or pollution events could result in the loss of suitable habitat. However, the Geyer's whorl Snail habitat is located within an area of the existing Duneill Wind Farm where turbine removal will take place during the construction phase of the Proposed Project. There is no new Proposed Wind Farm infrastructure located in this area of the existing Dunneill Wind Farm.

No excavation works are proposed within the vicinity of this parcel of habitat inhabited by Geyer's whorl snail, and as such there is no potential for alterations to the immediate groundwater table. Therefore, the hydrological functioning of supporting flush habitat for this species will not be impacted by the Proposed Project and no indirect habitat loss will arise as a result.

There are no groundworks required within 0.6km of the identified suitable habitat. On the dismantling and removal of Existing Wind Farm turbines and meteorological mast, it is not intended to remove the concrete foundation from the ground.

Therefore, the turbine foundations not incorporated into the Proposed Project will be backfilled and covered with soil material. If there is usable soil or overburden material on the site, 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 site-specific or 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. Hardstands shall be covered with soil material and regraded to match existing ground contours and profile. The area shall then be seeded out or allowed to vegetate naturally.

Residual Effect

There is no potential for residual adverse effect to Geyer's whorl snail via dewatering and indirect habitat loss as a result of the Proposed Project.

6.2.3 Otter

6.2.3.1 Disturbance

The Proposed Wind Farm is located within a separate hydrological subcatchment from the Unshin River SAC, which has otter listed as a Qualifying Interest. There is no hydrological connectivity between the Proposed Wind Farm and this SAC designated for otter.

No otter holts were found within 150m of the Proposed Project during the dedicated surveys undertaken, as described in Section 3.3.2.2 above. However, otter signs in the form of spraints were

found at a total of two survey locations along the Proposed Grid Connection Route which were within or hydrologically connected to the Unshin River SAC.

One of these sprainting locations was located on the Ballygrania River, with the surveyed area being located approx. 3.11km upstream of this SAC.

One of these sprainting locations was located on the Unshin River, which at the surveyed location is a component of the Unshin River SAC, for which otter is a designated QI species.

The installation of the Proposed Grid Connection Route within the existing public road network crosses over 35 no. existing water crossings, two of which are located directly over Unshin River SAC. Seven other watercourse crossings share hydrological connectivity with this SAC.

Otter are predominantly crepuscular in nature and it is anticipated that construction activity associated with the Proposed Grid Connection Route will be confined to daytime hours, thus minimizing potential disturbance related impacts to the species.

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. Irish Wildlife Manual No 76 (Reid *et al.*, 2013) 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 and Macdonald, 1986; Clavero, Prenda and Delibes, 2003; Bailey and Rochford, 2006).

No instream works are associated with the Proposed Grid Connection Route, as all cabling will be placed within existing road infrastructure. No otter holts were identified within 150m of the Proposed Grid Connection Route. No works associated with the Proposed Grid Connection Route will take place within the waterbodies of the Unshin River SAC, for which otter is a Qualifying Interest. Where the Proposed Grid Connection Route intersects with existing watercourses, HDD drilling will be used. In relation to disturbance, otters are predominantly crepuscular in nature, and it is anticipated that construction activity associated with the Proposed Grid Connection Route will be confined to daytime hours, thus minimizing potential disturbance related impacts to the species. Noise and vibration from HDD drilling is not likely to be significantly out of character with that associated with existing traffic conditions to which this QI species would be accustomed.

There is no connectivity between watercourses within the Proposed Wind Farm and the otter population of the Unshin River SAC.

Therefore, no potential for adverse effect via disturbance is expected as a result of the Proposed Grid Connection Route or the Proposed Wind Farm.

Residual Effect

There is no potential for residual adverse effect to otter within the Unshin River SAC as a result of the Proposed Grid Connection Route.

6.2.4 SCI Bird Species

As discussed in Section 4.1 and Section 5.1.4.1, it is not predicted that the listed SCI bird species of Ballysadare SPA utilise the site of the Proposed Wind Farm. Therefore, there is no potential for ex-situ indirect effects as a result of disturbance or habitat loss to any listed SCI species of any nearby SPA.

6.2.5 Water Quality Deterioration

A number of QI and SCI species and habitats of European sites were identified as having the potential to be indirectly affected with regard to surface water quality deterioration as a result of the Proposed Project.

Identified receptors comprise Annex I fluvial and lacustrine, and estuarine/coastal habitats of associated, European sites, and listed species which have the potential to be impacted by supporting habitat degradation as a result of water quality deterioration.

These identified QI/SCI receptors include:

➤ Lacustrine QI habitats of Ox Mountains Bogs SAC;

- [3110] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*),
- [3160] Natural dystrophic lakes and ponds

On a precautionary basis a potential pathway for indirect effect was identified with respect to the Lacustrine QI habitats of Ox Mountains Bogs SAC via potential water quality deterioration due to the implementation of the Proposed Biodiversity Enhancement Area. A lake mapped within the Site-specific Conservation Objectives document as '*Potential 3110/Potential 3160, Potential Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)/Potential Natural dystrophic lakes and ponds*' is located approximately 28m from the Proposed Enhancement Area. However, restoration and enhancement activities proposed for the Proposed Enhancement Area were designed to be located downhill from the mapped lake to avoid potential impact due to run off from enhancement activities.

➤ Coastal/Estuarine habitats of Ballysadare Bay SAC;

- [1130] Estuaries,
- [1140] Mudflats and sandflats not covered by seawater at low tide.

A potential pathway for indirect effect was identified with respect to these listed habitats via potential water quality deterioration as a result of run-off associated with the in-road works component of the Proposed Grid Connection Route, adjacent to and crossing watercourses which have hydrological connectivity with this European Designated Site.

➤ Aquatic QI species of Unshin River SAC;

- [1355] Otter,
- [1106] Atlantic salmon.

A potential pathway for indirect effect was identified with respect to these listed species via potential water quality deterioration as a result of run-off associated with the in-road works component of the Proposed Grid Connection Route, adjacent to and crossing watercourses which have hydrological connectivity with this European Designated Site.

➤ Aquatic-specific and aquatic-dependent QI habitats of Unshin River SAC;

- [3260] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation,
- [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)*A potential pathway for indirect effect was identified with respect to these listed habitats via potential water quality deterioration as a result of run-off associated with the in-road works component of the Proposed Grid Connection Route, adjacent to and crossing watercourses which have hydrological connectivity with this European Designated Site.

➤ Listed SCI bird species of Ballysadare SPA;

- [A046] Light-bellied Brent Goose,
- [A141] Grey Plover,
- [A149] Dunlin,
- [A157] Bar-tailed Godwit,
- [A162] Redshank.

A potential pathway for indirect effect was identified with respect to these listed species via potential water quality deterioration as a result of run-off associated with the in-road works component of the Proposed Grid Connection Route, adjacent to and crossing watercourses which have hydrological connectivity with this European Designated Site.

➤ **SCI supporting habitat of Ballysadare Bay SPA; [A999] Wetlands.**

A potential pathway for indirect effect was identified with respect to these listed habitats via potential water quality deterioration as a result of run-off associated with the in-road works component of the Proposed Grid Connection Route, adjacent to and crossing watercourses which have hydrological connectivity with this European Designated Site.

6.2.5.1 Construction Phase

The following mitigation measures set out below for the construction of the Proposed Wind Farm and the Proposed Grid Connection Route will ensure that any identified pathways for adverse effects on European Sites, as described above, are fully blocked and avoided.

6.2.5.1.1 Clear Felling

Felling works only relate to the Proposed Wind Farm and Turbine Delivery Route element and not the Proposed Grid Connection Route. Only the Proposed Wind Farm is assessed herein.

Tree felling will be required within and around Proposed Wind Farm infrastructure footprint to allow for the construction of 9 no. Proposed Turbine bases, access tracks, underground cabling, and the other ancillary infrastructure. 29.3ha of conifer plantation will be felled to accommodate the Proposed Wind Farm construction and operation.

It should be noted that forestry within the Proposed Wind Farm was originally planted as a commercial crop and will be felled in the future should the Proposed Project proceed or not.

The tree felling activities required as part of the Proposed Project will be the subject of a Felling Licence 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 licences for wind farm developments.

Potential impacts during tree felling occur mainly from:

- Exposure of soil and subsoils due to vehicle tracking or forwarding extraction methods resulting in a source of suspended sediment which can become entrained in surface water runoff and enter surface watercourses;
- Damage to roads resulting in a source of suspended sediment which can become entrained in surface water runoff and enter surface watercourses;
- Release of sediment attached to timber in stacking areas; and,
- Nutrient release.

Proposed Mitigation Measures

All felling 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);
- Forest Protection Guidelines (Forest Service, 2002);
- Forest Operations and Water Protection Guidelines (Coillte, 2013);
- Forestry and Water Quality Guidelines (Forest Service, 2000b);
- 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); and,
- 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%)	10 m	15 m
Steep	(15 – 30%)	15 m	20 m
Very steep	(>30%)	20 m	25 m

With the exception of existing road upgrades and proposed new roads, all proposed tree felling areas at the Proposed Wind Farm are generally located outside of imposed buffer zones. 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.

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. 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;
- Ditches which drain from the proposed area to be felled towards existing surface watercourses will be blocked, and temporary silt traps will be constructed. No direct discharge of such ditches to watercourses will occur. Drains and sediment traps will be installed during ground preparation. Collector drains will be excavated at an acute angle to the contour (approximately 0.3%-3% gradient), to minimise flow velocities. Main drains to take the discharge from collector drains will include water drops and rock armour, as required, where there are steep gradients, and will avoid being placed at right angles to the contour;
- Sediment traps will be sited in drains downstream of felling areas. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of in the peat disposal areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground;
- All drainage channels will taper out before entering the 50m buffer zone. This ensures that discharged water gently fans out over the buffer zone before entering the aquatic zone, with sediment filtered out from the flow by ground vegetation within the zone. On erodible soils, silt traps will be installed at the end of the drainage channels, to the outside of the buffer zone;
- 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. Correct drain alignment, spacing and depth will ensure that erosion and sediment build-up are minimized and controlled;
- Brash mats will be used to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they become heavily used and worn. Provision will 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;
- Timber will be stacked in dry areas, and outside a local 50 metre watercourse buffer. 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 run-off;
- Refuelling or maintenance of machinery will not occur within 50m of a watercourse. Fuel truck, drip kits, qualified personnel will be used where refuelling is required;
- A permit to refuel system will be adopted;
- 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;
- Crossing of streams will not be permitted;
- Trees will be cut manually from along streams and using machinery to extract whole tree; and,
- Travel only perpendicular to and away from stream.

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.

Drain Inspection and Maintenance:

The following items shall 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 shall be identified. Ideally the pre-felling inspection shall be carried out during rainfall;
- Following tree felling all main drains shall be inspected to ensure that they are functioning;
- Extraction tracks near 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 in the Site 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;
- Where possible, 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.

6.2.5.1.2 Potential for Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) to Result in Suspended Solid Entrainment in Surface Waters

There will be earthworks required for both the Proposed Wind Farm and Proposed Grid Connection Route (encompassing the Proposed Project) and therefore both are assessed herein.

Proposed Project construction phase activities that will require earthworks resulting in the removal of vegetation cover and excavation of peat and mineral subsoil (where present). Potential sources of sediment laden water include:

- Drainage and seepage water resulting from infrastructure excavation;
- Stockpiled excavated material providing a point source of exposed sediment;
- Construction of the underground cable trench resulting in the entrainment of sediment from the excavations during construction; and,

- Erosion of sediment from emplaced site drainage channels and borrow pit.

These activities can result in the release of suspended solids to surface watercourses and could result in an increase in the suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies, including waterbodies that form a component of the Unshin River SAC, which is crossed by the Proposed Grid Connection Route.

Proposed Mitigation Measures

Mitigation by Avoidance

The key mitigation measure during the construction phase of the Proposed Wind Farm is the avoidance of sensitive aquatic areas where possible. All of the key areas of the Proposed Wind Farm infrastructure are located significantly further from the 50m delineated buffer zones with the exception of 35 no. existing watercourse crossing locations and turbine delivery overrun areas that are 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 operated effectively. The proposed buffer zone will;

- Avoid physical damage 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
 - Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas or other similar/equivalent or appropriate measures.
- 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/attenuation lagoons, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems.
- Treatment systems:
 - Temporary sumps and attenuation 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 that a network of bog, forestry, wind farm and roadside drains already exist at the Proposed Wind Farm, and these will be integrated and enhanced as required and used within the Proposed Project drainage system. The integration of the existing drainage network and the Proposed Project network is relatively simple. The key elements being the upgrading and improvements to water

treatment elements, such as in line controls and treatment systems, including silt traps, stilling 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 Project 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 stilling 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.

Pre-commencement Temporary Drainage Works

Prior to the commencement of new tracks/hardstands (or track upgrades) the following key temporary drainage measures will be installed:

- All existing dry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using temporary check dams/silt traps;
- Clean water diversion 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 50m watercourse and 10m drain buffer zones such as at watercourse crossings.

The location of these temporary measures is detailed in the Drainage Drawings in **Appendix 6**.

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.

Silt Fences:

Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. 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 structures during construction phase will be carried out on a weekly basis. 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 50m 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 were calculated for various catchment areas in order to size the settlement ponds.

Level Spreaders and Vegetation Filters:

Level spreaders and vegetation filters will be implemented at the settlement ponds. 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 level spreaders, 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 Proposed Wind Farm drainage prior to reaching the downstream watercourses.

Pre-emptive Site Drainage Management

The works programme for the entire construction stage of the Proposed Project will also take account of weather forecasts, and predicted rainfall in particular. Large excavations and movements of peat/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). 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). 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 provides 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 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:

- Secure all open excavations;
- Provide temporary or emergency drainage to prevent back-up of surface runoff; and,
- Avoid working during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded.

Management of Runoff from Peat and Spoil Repository Areas:

It is proposed that excavated spoil and peat will be used for landscaping where required. The excess material will then be placed in dedicated peat/spoil management areas as well as placement of peat/spoil in the 3 no. proposed borrow pits once the rock is fully extracted.

All proposed peat and spoil management areas, including the 3 no. borrow pits are located outside of 50m watercourse buffer zones.

During the initial construction of repository/deposition areas, silt fences, straw bales and biodegradable geogrids will be used to control surface water runoff from works areas.

Where applicable, the vegetative top-soil layer of the peat and spoil management areas will be rolled back to facilitate placement of excavated spoil, following which the vegetative-top soils layer will be reinstated. Where reinstatement is not possible, spoil and peat management areas will be sealed with a digger bucket and seeded as soon possible to reduce sediment entrainment in runoff.

Drainage from peat and spoil storage areas will ultimately be routed to an oversized swale and a number of stilling ponds pond with appropriate storage and settlement designed for a 1 in 10-year return period before being discharged to the on-site drains.

Peat/subsoil reinstatement areas will be sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in runoff. Once re-vegetated and stabilised peat/subsoil reinstatement areas will no longer be a potential source of silt laden runoff.

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

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.

6.2.5.1.3 **Potential Effects on Surface Water Quality from Excavation Dewatering**

Pumping water from excavations might be required for both the Proposed Wind Farm and Proposed Grid Connection (Proposed Project) and therefore both are assessed herein.

Some minor groundwater/surface water seepages will likely occur in turbine foundation excavations, borrow pits and cabling trenches, and this will create small additional volumes of water to be treated by the runoff management system. Cable trenching might require removal of water prior to backfilling.

Inflows will likely require management and treatment to reduce suspended sediments. No contaminated land was noted at the Site and therefore baseline contamination does not occur.

Mitigation

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.

6.2.5.1.4 **Potential Effects from Hydrocarbons**

Hydrocarbons will be required for both the Proposed Wind Farm and Proposed Grid Connection Route (Proposed Project) and therefore both are assessed herein.

Accidental spillage during refuelling of construction plant with petroleum hydrocarbons is a significant pollution risk to groundwater, surface water and associated ecosystems, and to terrestrial ecology. The accumulation of small spills of fuels and lubricants during routine plant use can also be a pollution risk. Hydrocarbon has a high toxicity to humans, and all flora and fauna, including fish, and is persistent in the environment. It is also a nutrient supply for adapted micro-organisms, which can rapidly deplete dissolved oxygen in waters, resulting in death of aquatic organisms.

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 fuel truck at a dedicated refuelling area located at the temporary construction compounds. 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 8**). Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.

6.2.5.1.5 **Potential Effects from Wastewater**

Wastewater management will be required for both the Proposed Wind Farm and Proposed Grid Connection Route (Proposed Project) and therefore both are assessed herein.

Release of effluent from domestic wastewater treatment systems has the potential to impact on groundwater and surface waters if site conditions are not suitable for an on-site percolation unit.

Proposed Mitigation Measures:

- It is proposed to manage wastewater from the staff welfare facilities in the control buildings by means of a sealed storage tank, with all wastewater being tankered off-site by permitted waste collector to wastewater treatment plants. It is not proposed to treat wastewater on-site.
- During the construction phase there will be 4 no. temporary construction compounds each of which will contain a self-contained port-a-loo with an integrated waste holding tank will be used at each of the site compounds, maintained by the providing contractor, and removed from site on completion of the construction works.

6.2.5.1.6 **Potential Effects due to Watercourse Crossing Works (Proposed Wind Farm)**

2 no. new proposed watercourse crossings and upgrades of existing watercourse crossings will only be required at the Proposed Wind Farm and not along the Proposed Grid Connection Route. Only the Proposed Wind Farm is assessed herein.

Culverting and bridge crossing of surface watercourses can result in morphological changes, changes to drainage patterns and alteration of aquatic habitats. Construction of structures over water courses has the potential to significantly interfere with water quality and flows during the construction phase.

1 no. new proposed culvert crossing and the upgrade of 1 no. existing watercourse crossings (clear span crossing design) will be required to facilitate the Proposed Wind Farm infrastructure.

Proposed Mitigation Measures:

- Upgraded stream crossings 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 internal 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 Ireland²¹ is 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);
- 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 and upgraded 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 (approx 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

²¹ Inland Fisheries Ireland (2016): *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*

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.

6.2.5.1.7 **Potential Effects from the Use of Siltbuster**

Both the Proposed Wind Farm and Proposed Grid Connection Route may incorporate the use of a siltbuster. Therefore, both are assessed herein.

Siltbusters are regularly used to remove suspended sediments on construction sites by means of chemical dosing and sedimentation (i.e. use of coagulants and flocculants to accelerate the settlement process). The benefits of using enhanced settlement systems on downstream surface water quality are widely known and are a positive effect. However, potential overdosing with chemical agents means there is a perceived risk of chemical carryover in post treatment water which could result in negative effects on downstream water quality.

Construction water (i.e. surface water runoff or pumped groundwater) has sometimes very fine particles, particularly clays and peat, with slow settling velocities which do not settle out efficiently, even in a lamella clarifier at normal flow rates. In these cases, chemical dosing can be used to aggregate the particles (i.e. force them to combine and become heavier), increasing the particle settling rate and cleaning the water via gravity separation techniques. Agents commonly used include poly aluminium chloride (PAC), aluminium sulphate, ferric iron and ferrous iron. These agents are commonly used in drinking water treatment plants so their use is widespread, and there is significant scientific knowledge about their use and control.

The benefits of using a Siltbuster system in emergency scenarios where all other water treatment systems have proven ineffective are considerable.

Mitigation

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 reagents, so overdosing cannot occur;
- Continued monitoring and water analysis of pre and post treated water by means of an inhouse lab and dedicated staff will be carried out, which 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 will be used at very sensitive sites, including upstream of European Designated Sites.

6.2.5.1.8 **Potential Effects from Earthworks Works and Watercourse Crossings (Proposed Grid Connection Route)**

The Proposed Grid Connection Route comprises approximately 41km of underground cabling route and 34 no. existing watercourse crossings along public roads. 33 no. of the watercourses are EPA mapped watercourses with the rest being small unmapped watercourses and drains.

Horizontal Directional Drilling (HDD) will be used to negotiate 15 no. bridge structures and open trenching will be used to place the cable above or below the culvert at the 19 no. other crossing locations.

No instream works are proposed at any of the Proposed Grid Connection Route cable crossing locations.

Mitigation

Proposed Mitigation Measures:

Pre-commencement Temporary Drainage Works:

Prior to the commencement of the cable trenching or crossing 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; and,
- A double silt fence perimeter will be placed along the road verge on the down-slope side of works areas that are located inside a watercourse 50m buffer zone.

The following mitigation measures will be implemented for the underground cabling watercourse crossing works:

- No stock-piling of construction materials will take place along the Proposed Grid Connection Route;
- No refuelling of machinery or overnight parking of machinery is permitted within 50m of a watercourse crossing;
- No concrete truck chute cleaning is permitted along the Proposed Grid Connection Route;
- 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. Although no instream works are proposed or will occur;
- Any excess construction material will be immediately removed from the area and sent to a licenced waste facility;
- 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;
- Double 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.

6.2.5.1.9 **Existing Wind Farm Turbine Removal**

The existing 23 no. turbines and meteorological mast onsite will be removed from site in accordance with SSE Renewables standards, whereby all elements of the turbines will be recycled and reused, and no components will be sent to landfill.

On the dismantling of existing turbines and meteorological mast, it is not intended to remove the concrete foundation from the ground and therefore no significant earthworks will be required.

It is considered that its removal will be the least preferred options in terms of having potential effects on the environment. Therefore, the turbine foundations not incorporated into the Proposed Project will be backfilled and covered with soil material

Hardstands not being used for the re-used for the construction and operation of Proposed Wind Farm shall be covered with soil material and regraded to match existing ground contours and profile. The area shall then be seeded out or allowed to vegetate naturally.

There are sections of the existing track network which will not be upgraded to facilitate the Proposed Project. These will remain in use by local landowners to access livestock or will be left to naturally regenerate.

Mitigation

Pre-commencement Temporary Drainage Works:

Prior to the commencement of the removal 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; and,
- A double silt fence perimeter will be placed along the road verge on the down-slope side of works areas that are located inside a watercourse 50m buffer zone.

Once the turbine base and hardstand are backfilled and covered with soil material, vegetation will be established to prevent risk to downstream surface water quality due to runoff.

6.2.5.1.10 **Potential Effects of the Biodiversity Management and Enhancement Plan**

The Biodiversity Management and Enhancement Plan submitted with the planning application for the Proposed Project will serve to offset the loss of 0.5ha of blanket bog and 3.6ha of cutover bog through the enhancement of approx. 36ha of peatland habitats which will provide further connectivity between fragments of the Ox Mountains Bog SAC.

In order to reinstate an intact hydrology regime throughout the management areas, alterations to the structure of the peatland will be reversed or mitigated wherever peat stability, peat condition and vegetation communities indicate a potential for successful restoration. This includes areas of previous peat cutting in the northern section with step vertical surfaces that disrupt the hydrological connection between higher and lower lying areas of peat, and areas with drain networks. Where drainage and

erosion have caused significant areas of bare peat (Plate 2-2) steps will be taken to reinstate the vegetation in this area.

Drain Blocking

- The methodology laid out in Nature Scots “Peatland Action- Technical Compendium” will be followed for the installation of drain blocks²²
- Some minor drains will be blocked as required, infilling to approx. 30 cm of ground level to allow for some drainage in extreme weather events
- Drain blocking will only be undertaken in areas of no to slight sloping ground
- Peat dams will be used where possible
- On shallow grounds (<1 degree) the maximum spacing between dams will be 15m, intervals on slightly sloping grounds will be shorter (7.5m on 2 degree slopes, 5m on 3 degree slopes, 4m on 4 degree slopes and 3m on 5 degree slopes)
- A low ground pressure excavator will be used to undertake the works
- Peat donation sites will be located upstream and upslope from the peat dam
- Peat donation pits will be stretched inwards from the sites to recreate a coherent surface.

Erosion control

- The methodology laid out in Nature Scots “Peatland Action- Technical Compendium” will be followed for the flow management²³
- Shallow erosion gullies(<50cm) caused by heavy trampling linked to herbivores will be mitigated through flow management with the installation of surface bunds
- Locations for bunds will be marked out prior to installation
- Turves/peat will be preferred as bunds material if good material can be found on site in borrow pits, otherwise alternative materials compliant with the guidance will be considered
- A low ground pressure excavator will be used to undertake the works
- Peat donation sites will be located upstream and upslope from the peat dam
- Peat donation pits will be stretched inwards from the sites to recreate a coherent surface.

An area demarcated for erosion control under the Biodiversity Management and Enhancement Plan (BMEP) is located approximately 19m from an area of lacustrine habitat mapped in the Site-specific Conservation Objectives document as ‘*Potential 3110/Potential 3160, Potential Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorarae)/Potential Natural dystrophic lakes and ponds*’.

This lake is located approximately 130m to the south of an area demarcated for drain blocking under the BMEP.

Given the small-scale nature of the works associated with the Biodiversity Enhancement Management Plan, there is no potential for impact to the adjacent lacustrine habitat of the Ox Mountains Bogs SAC as a result of water quality degradation associated with the works.

6.2.5.1.11 Potential for Residual Adverse Effect Following Mitigation

Following the implementation of the above prescribed mitigations with regard to construction of the Proposed Project and implementation of the Biodiversity Management and Enhancement Plan, there is no potential for residual adverse effect on European Sites as a result of water quality deterioration.

²² <https://www.nature.scot/doc/peatland-action-technical-compendium-restoration-4-artificial-drains>

²³ <https://www.nature.scot/doc/peatland-action-technical-compendium-restoration-6-flow-management>

6.2.5.2 Operational Phase

6.2.5.2.1 Potential Effects from the Replacement of Natural Surfaces with Low Permeability Surfaces

Hardstand emplacement will only be required at the Proposed Wind Farm. As a result, only the Proposed Wind Farm is assessed herein. There will be no potential increase in runoff along the Proposed Grid Connection Route. The works are located in the carriageway of the existing road corridor and no change in surface water runoff rates will result as the trench and road surface will be reinstated.

The potential for increased surface water runoff is the primary potential impact during the operational phase of the Proposed Project.

Progressive replacement of the vegetated surface with impermeable surfaces will decrease the permeability of the ground within the Proposed Wind Farm footprint (i.e., turbine bases, hardstandings, 110kV substation and to a lesser extent the new access roads).

It should be noted that approximately 12.5km of the existing access roads and tracks already exist and are proposed for upgrade. The permeability along the internal underground cabling route through the Proposed Wind Farm will not be significantly altered, as the fill material will not be compacted.

The emplacement of the Proposed Wind Farm footprint, as described in Ch. 4: Description of the Proposed Project of the EIAR, (assuming emplacement of impermeable materials as a worst-case scenario) could result in an average total site increase in surface water runoff of approximately 2,998m³/month or 97m³/day. This represents a potential increase of approximately 0.2% in the average daily/monthly volume of runoff from the Proposed Wind Farm area in comparison to the baseline pre-development site runoff conditions.

This is a very small increase in average runoff and results from a relatively small area of the overall Proposed Wind Farm being developed. Specifically, the permanent Proposed Wind Farm footprint is approximately 21ha, representing only 2.8% of the total Proposed Wind Farm area of 743ha.

The additional volume is low due to the fact that the runoff potential from the Proposed Wind Farm is naturally high (93%). Also, this calculation assumes that all hardstanding areas will be impermeable which considered to be a worst-case scenario. The increase in runoff from most of the development catchment will therefore be imperceptible and this is before mitigation measures will be put in place. This water balance assessment demonstrates that even in the absence of mitigation, the potential to alter the water balance of the Site or downstream hydrology/morphology is imperceptible.

Mitigation

Two distinct methods will be employed to manage drainage water within the Proposed Project. The first being 'keeping clean water clean' and the second involving the collection of any drainage waters from work area and to route them towards stilling ponds prior to controlled diffuse release over vegetated surfaces. The second method relates to proposed design measures that will prevent road surface and other hardstand areas acting as preferential flowpaths. All development site runoff will be collected, attenuated, treated and then released in a diffuse and regular manner that does not significantly change the natural drainage regime/hydrology of the site.

The operational phase drainage system of the Proposed Project will be installed and constructed in conjunction with the road and hardstanding construction work as described below and as shown on the drainage drawings (**Appendix 6**) submitted with this planning application:

- Interceptor drains will be maintained 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 will 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 will be designed in consideration of the greenfield runoff rate.

These measures will ensure all surface water runoff from upgraded roads and new road surfaces (including hardstands and turbine base areas) will be captured and treated prior to discharge/release. Settlement ponds, check dams and buffered outfalls will prevent roads acting as preferential flowpaths by providing attenuation and water quality treatment.

6.2.5.2.2 **Potential Water Quality Effects from Runoff**

Operational phase, site runoff will occur at the Proposed Wind Farm only and not the Proposed Grid Connection Route which will be fully underground within existing road infrastructure. Only the Proposed Wind Farm is assessed herein.

During the operational phase, the potential for silt-laden runoff is much reduced compared to the construction phase. In addition, all permanent drainage controls will be in place, and the disturbance of ground and excavation works will be complete. Some minor maintenance works are likely to be completed, such as maintenance of site entrances, internal roads and hardstand areas. These works will be of a very minor scale and will be very infrequent. Potential sources of sediment laden water will only arise from surface water runoff from small areas where new material is added during maintenance works.

These minor activities could, however, result in the release of suspended solids to surface water and could result in an increase in the suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies.

Mitigation

The mitigation measures outlined in Sections 6.2.5.1.2 and 6.2.5.2.2 will ensure all surface water runoff from upgraded roads and new road surfaces (including hardstand and turbine base areas) 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.

6.2.5.2.3 **Potential for Residual Adverse Effect Following Mitigation**

Following the implementation of the above prescribed mitigations with regard to operation of the Proposed Project, there is no potential for residual adverse effect on European Sites as a result of water quality deterioration.

6.3 Decommissioning Phase

The Proposed Turbines are expected to have a lifespan of approx. 35 years. Following the end of their useful life, the equipment may be replaced with a new technology, subject to planning permission being obtained, or the Proposed Wind Farm may be decommissioned fully.

Upon decommissioning of the Proposed Wind Farm, the wind turbines and the meteorological mast would be disassembled. All above ground turbine and mast components would be separated and removed off-site for recycling. Turbine and mast foundations would remain underground and would be covered with earth and allowed to revegetate. Leaving the foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant temporary environment nuisances such as noise, dust and/or vibration. Site roadways will be used during the operational phase by farm machinery and therefore will be retained where requested post-decommissioning to facilitate these activities.

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

The Proposed Grid Connection underground electrical cabling route and onsite substation will remain in place as it will be part of the Electricity Grid under the ownership and control of the ESB and Eirgrid.

Mitigation

A Decommissioning Plan (Appendix 9) has been prepared and sets out a list of mitigation measures:

- The decommissioning of all associated infrastructure is detailed
- Refuelling is subject to mitigation measures with additional measures in place to avoid the release of hydrocarbons on the site.
- Mitigation to prevent significant effects during the construction phase will be applicable in the decommissioning phase

6.3.2 Potential for Residual Adverse Effect Following Mitigation

There is no potential for residual adverse effect on European Sites during the decommissioning phase of the Proposed Project.

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 for habitats is provided below:

‘conservation status of a natural habitat means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2; The conservation status of a natural habitat will be taken as ‘favourable’ when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structures 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 (as defined below).

A definition of Favourable Conservation Status for species is as follows:

‘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.’

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 cumulative and/or in-combination impacts on European Sites was conducted. This assessment focuses on the potential for cumulative 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 plans and projects considered is provided in **Appendix 5**.

8.1 Plans

The following Development Plans have been reviewed and taken into consideration as part of this assessment:

- Sligo County Development Plan 2024-2030
- 4th National Biodiversity Action Plan 2023-2030
- Regional Spatial and Economic Strategy for the Northern and Western Region (2020-2032)

A review of the objectives of the Plans relating to European Designated Sites has been carried out and is provided in the **Appendix 5**. No potential for cumulative effects when considered in-combination with the Proposed Project has been identified, and the Proposed Project is in compliance with the relevant objectives of the Plan.

In addition, the Appropriate Assessment carried out for these Plans have been reviewed. The relevant Natura Impact Report (NIR) is found on the Sligo County Council website at the following link:

<https://www.sligococo.ie/cdp/Environmentalreports/>

The Appropriate Assessment carried out for the Development Plan has concluded that there is no potential for Residual Adverse Effect as a result of implementation of the Plan. Therefore, there is no potential for cumulative effect as a result of the Proposed Project in-combination with the Plan.

8.2 Projects

Assessment material for this cumulative assessment was compiled on the relevant developments within the vicinity of the Proposed Project. 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, NISs, 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 surface water, groundwater and QI habitats and species. For this reason, other projects within the hydrological catchment have been considered. The assessment of the potential for cumulative effects on nearby SPAs has been restricted

to the potential for cumulative hydrological effects. This is due to the lack of a potential for any ex-situ direct or indirect effects to the listed SCI species identified as a result of the Proposed Project.

8.2.1 **Other Projects within the Hydrological Sub catchments**

The cumulative Water Study Area for the Proposed Wind Farm is the Easky River, Dunneill River and Lugdoon Stream catchments.

The cumulative Water Study Area for the Proposed Grid Connection Route is Easky River, Dunneill River, Buncrowney River, Doonbeakin River, Lugdoon Stream, Kilrusheighter Stream, Doonflin Stream, Dunmoran River, Barnabrack Stream, Ballysodare River, Owenmore River and Unshin River.

8.2.1.1 **Surrounding Land Use**

8.2.1.1.1 **Cumulative Effects with Other Wind Farm Developments**

A list of other wind farm developments in the Proposed Wind Farm Water Study Area is shown in Table 8-1 below.

Other than the Existing Wind Farm (i.e. Dunneill and Kingsmountain) there are no other existing, permitted or proposed wind farm developments in the Dunneill River subcatchment.

There are 5 no. existing wind farm developments in the Easky River subcatchment as shown in Table 8-1 below. Because these wind farms are existing and operational there is no potential for construction phase overlaps with the Proposed Project.

There is only one permitted wind farm (Firlough WF), but only 1 no. of its proposed turbines is located in the Easky River catchments and cumulative effects are not likely even if construction phase overlaps with the Proposed Project.

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 vicinity.

Table 8-1. List of Other Wind Farm Developments Assessed for Hydrological Cumulative Effects.

Catchment	Development (Status)	Total Turbine No.	Turbine No. Catchment (Water Study Area)
Easky River	Black Lough WF (Existing)	4	2
	Carrowleagh 1 WF (Existing)	13	11
	Cloonkeelaun Single Wind Turbine (Existing)	1	1
	Cloonkeelaun Wind Farm (Carrowleagh WF Extension) (Existing)	3	3
	Cloonkeelaun 2 Wind Turbine (Existing)	2	2
	Firlough WF (Permitted)	13	1
Totals for Easky Subcatchment			20
Dunmorán River	Dunneill WF (Existing)	13	13
	Kingsmountain WF (Existing)	10	10
Totals for Dunmorán Subcatchment			23

8.2.1.1.2 Cumulative Effects with Agriculture

According to Corine land cover mapping (www.epa.ie) (2018) the catchments pertaining to the Proposed Wind Farm and its surrounds are largely agricultural catchments.

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 6.2.5 for the construction, operation and decommissioning phases of the Proposed Project will ensure the protection of downstream surface water quality.

For these reasons, it is considered that there will not be an adverse effect associated with agricultural activities.

8.2.1.1.3 **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.

With regard to non-wind farm related forestry activities at the Site and the potential for cumulative impacts, it is proposed that all scheduled tree felling or replanting will not take place the same time as the Proposed Project construction phase in order to prevent hydrological cumulative impacts. No scheduled tree felling will occur in the same local catchment where the Proposed Project construction is taking place.

For these reasons it is considered that there will not be an adverse effect associated with commercial forestry activities.

8.2.1.1.4 **Cumulative Effects with Turbary Peat Cutting Activities**

Private peat cutting on turbary plots will likely continue in the vicinity of the Site and in the wider cumulative area. The construction phase of the Proposed Project is likely to interact with these turbary activities and result in a potential deterioration of downstream surface water quality through the emissions of elevated concentrations of suspended solids and ammonia.

However, the areas of private peat cutting will be small, significantly limiting the potential for cumulative effects to arise with the Proposed Project. Nevertheless, the mitigation measures detailed for the construction, operational, and decommissioning phases of the Proposed Project will ensure the protection of downstream surface water quality.

For these reasons outlined above it is considered that there will not be an adverse effect associated with turbary activities.

8.2.1.1.5 **Cumulative Effects with Other 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 (refer to **Appendix 5** for the list of developments assessed). 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).

8.2.2 **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.

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 development.

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. It has also assessed the potential for in-combination effects on European site with other plans and projects.

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 does not adversely affect the integrity of European sites.

Following an examination, evaluation and analysis, in light of best scientific knowledge and the conservation objectives of the site, and, on the basis of objective information, having taken into account the relevant mitigation measures, 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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