



APPENDIX 1

APPROPRIATE ASSESSMENT SCREENING REPORT

Appropriate Assessment Screening Report

Seven Hills Wind Farm, Co.
Roscommon





DOCUMENT DETAILS

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1. INTRODUCTION

1.1 Background

MKO and SLR Consulting, have been appointed to provide the information necessary to allow the competent authority to conduct a Screening for Appropriate Assessment for a proposed twenty turbine wind farm development in Cuilleenoolagh and adjacent townlands in Co. Roscommon.

MKO have provided the assessment of Special Areas of Conservation (SAC) and supporting wetland habitat for Special Conservation Interest species associated with Special Protection Areas (SPA). SLR Consulting have provided the assessment with respect to avian receptors associated with SPAs, including consideration of their use of areas located outside the relevant SPA boundaries (including other wetland sites designated for non-avian interests).

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 likely significant effect on a European Site. Screening is the process of determining whether an Appropriate Assessment is required for a plan or project. The Proposed Development 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.

The assessment in this report is based on a desk study and field surveys undertaken between September 2016 and October 2021. It specifically assesses the potential for the Proposed Development to result in significant effects on European sites in the absence of any best practice, mitigation or preventative measures.

This Appropriate Assessment Screening Report has been prepared taking consideration of the following guidance:

1. *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, 2001)*
2. *Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2018)*
3. *Department of the Environment's Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DoEHLG, 2010).*
4. *Council of the European Commission (1992) Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Official Journal of the European Communities. Series L 20, pp. 7-49.*
5. *EC (2000) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg.*
6. *EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence. Opinion of the commission.*
7. *EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission.*
8. *EC (2021) Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC*

1.2 Appropriate Assessment

1.2.1 Screening for Appropriate Assessment

Screening is the process of determining whether an Appropriate Assessment is required for a plan or project. Under Part XAB of the Planning and Development Act, 2000, as amended, screening must be carried out by the Competent Authority. As per Section 177U of the Planning and Development Act, 2000, as amended 'A screening for appropriate assessment shall be carried out by the competent authority to assess, in view of best scientific knowledge, if a proposed development, individually or in combination with another plan or project is likely to have a significant effect on the European site. The Competent Authority's determination as to whether an Appropriate Assessment is required must be made on the basis of objective information and should be recorded. The Competent Authority may request information to be supplied to enable it to carry out screening.

Consultants or project proponents may provide the competent authority, with the information necessary for them to determine whether an Appropriate Assessment is required and to assist them in the Appropriate Assessment Screening decision.

Where it cannot be excluded beyond reasonable scientific doubt at the Screening stage, that a proposed plan or project, individually or in combination with other plans and projects, would have a likely significant effect in view of the conservation objectives of a European site, an Appropriate Assessment is required.

Where an Appropriate Assessment is required, the Competent Authority may require the applicant to prepare a Natura Impact Statement.

The term Natura Impact Statement (NIS) is defined in legislation¹. An NIS, where required, must present the data, information and analysis necessary to reach a definitive determination as to 1) the implications of the plan or project, alone or in combination with other plans and projects, for a European site in view of its conservation objectives, and 2) whether there will be adverse effects on the integrity of a European site. The NIS must be underpinned by best scientific knowledge, objective information and by the precautionary principle.

This Appropriate Assessment Screening Report has been prepared in compliance with section 177U of the Planning & Development Acts as amended.

Statement of Authority

The baseline ecological surveys were undertaken by David McNicholas (B.Sc., M.Sc., MCIEEM), Katie Pender, (BSc.), Patrick Ellison (BSc., MSc., ACIEEM), Cathal Bergin (BSc) and Rudraksh Gupta (BSc., MSc). All surveyors have relevant academic qualifications and experience in undertaking habitat and ecological assessments and are competent experts for the purposes of carrying out the field the surveys and assessments that they were required to do.

Dedicated bat surveys for the site were undertaken between April and September 2020 by Aoife Joyce (BSc., MSc.), Luke Dodebier (BSc.), Rachel Walsh (BSc.), Katie Pender (BSc.) and Neil Campbell (BSc.). All staff have relevant academic qualifications and professional experience and are competent

¹ As defined in Section 177T of the Planning and Development Act, 2000 as amended, an NIS means a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own and in combination with other plans and projects, for a European site in view of its conservation objectives. It is required to include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for the European site in view of its conservation objectives

experts for the purposes of carrying out the field the surveys and assessments that they were required to do.

Dedicated bird surveys of the site of the Proposed Development (see Section 2.2) and the surrounding area (see Section 2.2.2.1) were undertaken between October 2018 and September 2021, and an ornithological assessment has been carried out by Mike Austin MCIEEM and Dr Jonathon Dunn MCIEEM and reviewed by Duncan Watson CEnv MCIEEM, all of SLR Consulting. Mike is a Senior Ornithologist with over 30 years' professional experience who has undertaken ornithological assessments for over 15 wind farms across the UK and Ireland. Jonathon is a Senior Ornithologist with over 6 years' professional experience who has worked on multiple wind farm projects in Ireland. Duncan is a Technical Director with over 23 years' professional experience and has worked on over 80 proposed, consented and operational wind farm developments throughout the UK and Ireland.

MKO have provided the assessment of Special Areas of Conservation and supporting wetland habitat for Special Conservation Interest species associated with Special Protection Areas. This input has been prepared by Patrick Ellison. Patrick is an experienced ecologist with over 5 and a half years' professional experience. MKO's input has been reviewed by John Hynes (B.Sc., M.Sc., MCIEEM). John is a highly experienced ecologist who has over 10 years' professional experience in environmental management and ecological assessment. SLR Consulting have provided the assessment with respect to avian receptors associated with Special Protection Areas. This input has been prepared by Jonathon Dunn and reviewed by Duncan Watson.

2. DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Site Location

The Proposed Development will be located approximately 1.5 kilometres away northeast and southeast of the village of Dysart, and approximately 11 kilometres northwest/west of the town of Athlone, Co. Roscommon.

The approximate location for the centre of the site is E587977, N745843. The Proposed Development covers an area of approximately 588 hectares, in total, and it is divided into two clusters.

The land uses and types within the Proposed Development site are almost entirely agricultural grasslands which are used for grazing and pasture farming in its current land use, with some small areas of scrub. Other land types within the surrounding area consist of small areas of non-commercial forestry, scrub, peat-cutting and low-density residential areas in nearby villages. There are a number of small lakes, turloughs and seasonal lakes located within proximity of the site, which drain into the river suck, a tributary of the River Shannon, approximately 3km west of the Proposed Development.

In addition to agriculture, other land-uses in the surrounding area include small scale forestry activities, peat-cutting and low-density residential areas in nearby villages. There is also an active quarry site adjacent to the Proposed Development site. The operational Skrine Wind Farm is the closest existing wind farm development, located approximately 8.5km to the north and comprising of only two turbines.

The nearest existing grid infrastructure is an Athlone 110 kV substation located in the townland of Monksland in Athlone, County Roscommon, approximately 11.3km to the east of the Southern Cluster. Other existing grid infrastructure in the area includes an existing 110kV overhead line, located approximately 6.5km north of the Northern Cluster, which runs from the Athlone 110kV substation at Monksland to the town of Roscommon to the north of the site.

The location of the site is shown in Figure 2-1. The area encompassed by the boundary in this Figure will be referred to from this point on as the site of the Proposed Development or the site.

For the purposes of this assessment:

- Where the ‘site of the Proposed Development’ or the ‘Proposed Development’ is referred to, this relates to all the project components described below. This relates to the primary study area for the development, as delineated by the boundary in green as shown in Figure 2-1.
- Where the ‘Wind Farm’ is referred to, this relates to all wind farm infrastructure as described below and divided into both the Northern and Southern Clusters.
- The ‘Grid Connection’ is referred to, this relates to all grid infrastructure, as detailed below.
- Where ‘the site’ is referred to, this relates to the primary study area for the development, as delineated by the boundary in green as shown on Figure 2-1.

2.2 Characteristics of the Proposed Development

2.2.1 Description of the Proposed Development

The Proposed Development comprises:

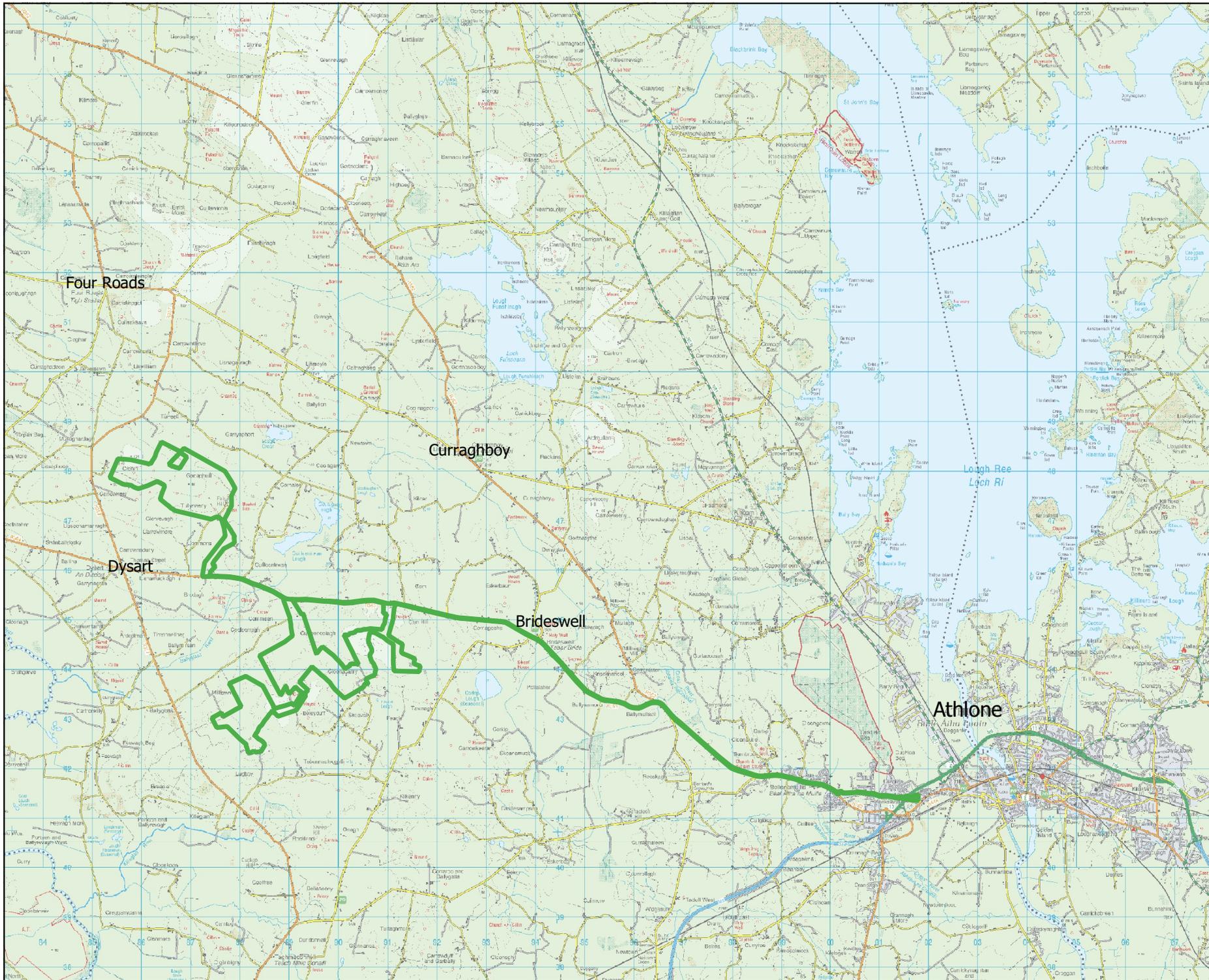
- i. 20 no. wind turbines with an overall ground to blade tip height of 180 metres, a rotor diameter of 162m and a hub height of 99m, associated foundations, hard-standing areas*
- ii. 15 no. spoil storage areas at hardstands of turbines no. 1, 2, 3, 4, 5, 6 and 7 (in the townlands of Turrock, Gortaphuill, Cronin, and Tullyneeny) and turbines no. 8, 10, 11, 13, 14, 17, 19 and 20 (in the townlands of Milltown, Cuilleenoolagh, Cloonacaltry, Feacle and Tawnagh)*
- iii. Provision of 1 no. permanent meteorological mast with a maximum height of 100 metres for a period of 30 years from the date of commissioning of the entire wind farm*
- iv. Provision of 1 no. 110kV onsite substation in the townland of Cam, along with associated control buildings, MV switchgear building, associated electrical plant, associated security fencing, and equipment and wastewater holding tank*
- v. All underground electrical and communication cabling connecting the proposed wind turbines to the proposed onsite substation and associated control buildings and plant*
- vi. All works associated with the connection of the proposed wind farm to the national electricity grid via underground 110kV cabling from the site to the existing Athlone 110kV substation located in the townland of Monksland. Cabling will be placed within the public road corridor of the R362, R363 and L2047, or on private land*
- vii. Upgrade works to the existing 110kV Athlone substation consisting of the construction of an additional dedicated bay to facilitate connection of the cable*
- viii. Provision of 2 no. new site accesses north and south from the R363 and upgrade of 1 no. junction south of the R363*
- ix. Provision of new access tracks/roads and upgrade of existing access tracks/roads*
- x. 7 no. overburden storage areas*
- xi. 2 no. temporary construction compounds*
- xii. Site drainage works*
- xiii. Operational stage site signage*
- xiv. All associated site development works, apparatus and signage*

All elements of the Proposed Development have been assessed as part of this AA Screening Report.

This application is seeking a ten-year planning permission to construct the Proposed Development and a 30-year operational life from the date of commissioning.

The layout of the Proposed Development has been designed to minimise the potential environmental effects of the wind farm, while at the same time maximising the energy yield of the wind resource passing over the site. A constraints study, described in Section 3.4 of the accompanying EIAR, has been carried out to ensure that turbines and ancillary infrastructure are located in the most appropriate areas of the site.

The overall layout of the Proposed Development is shown on Figure 2-2.



Map Legend

 EIAR Site Boundary

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Drawing Title
Site Location

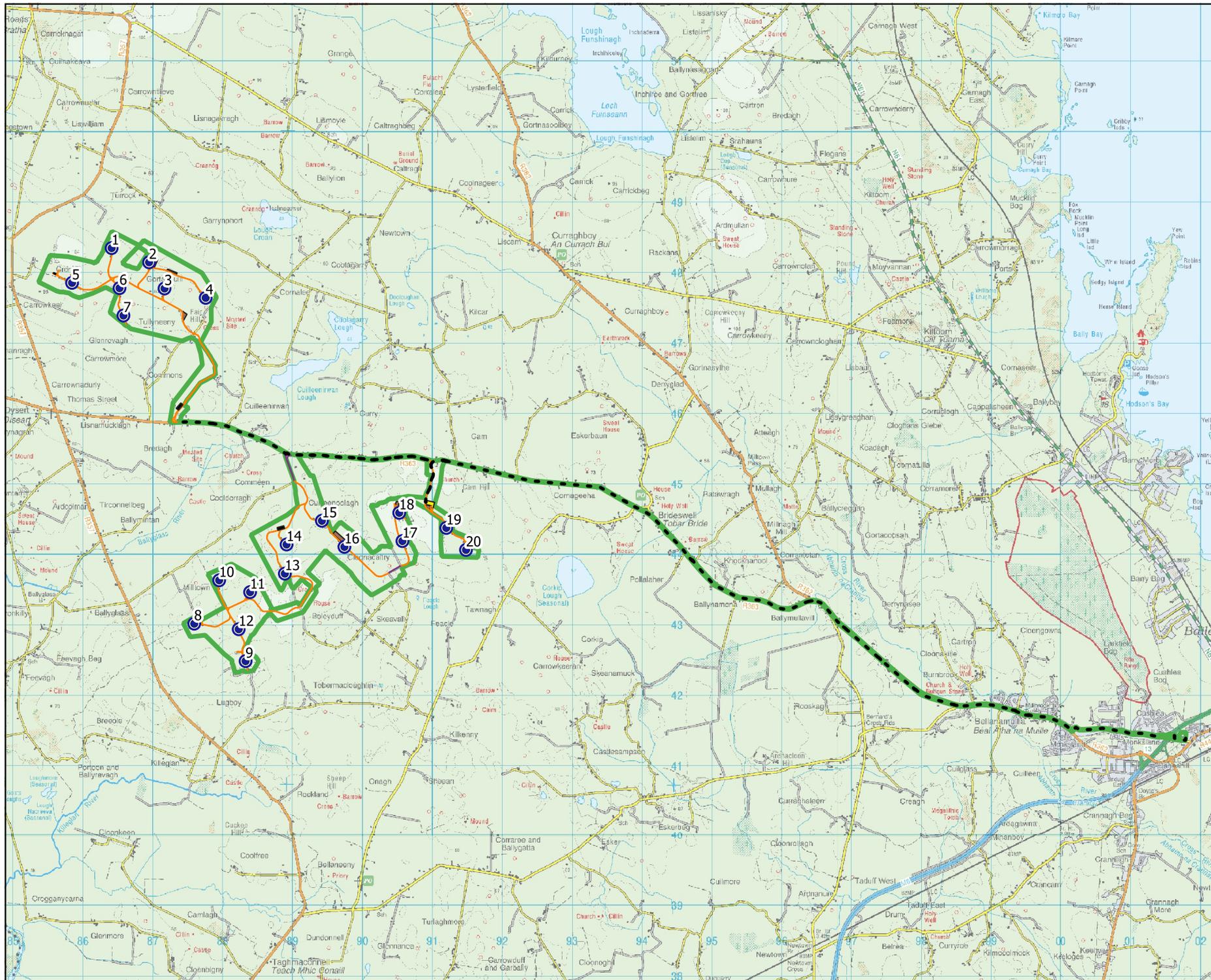
Project Title
Seven Hills Wind Farm, Co. Roscommon

Drawn By DN	Checked By OM
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Project No 190907	Drawing No. Figure 2-1
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Scale 1:100000	Date 30.05.2021
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- ### Map Legend
- EIAR Site Boundary
 - Proposed Turbine Layout
 - Proposed Hardstands
 - Proposed Access Roads
 - Proposed Upgrades to Existing Access Roads
 - Proposed 110kV Substation Location
 - Proposed Construction Compounds
 - Proposed Met Mast Location
 - Proposed Overburden Storage Areas
 - Infrastructure Overburden Storage Areas
 - Proposed Connector Cabling and Grid Connection



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Proposed Layout	
Project Title Seven Hills Wind Farm, Co. Roscommon	
Drawn By DN	Checked By OM
Project No. 190907	Drawing No. Figure 2-2
Scale 1:70500	Date 01.06.2021



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A connection between the onsite electrical substation and the national electricity grid will be necessary to export electricity from the Wind Farm site. It is proposed to construct a 110 kV substation within the site and to connect from here via a 110 kV underground cable connection to the existing Athlone 110 kV substation in Monksland, located approximately 11.3km to the east of the Southern Cluster, via underground cabling. The majority of the Grid Connection route is located within the public road and measures approximately 12km in total. This underground cable connection will originate at the proposed electrical onsite substation, continue along the R363, transitioning to the R362 near the townland of Ballymullavill, travelling north along the L2047 before reaching the Athlone 110 kV substation at Monksland.

The Proposed Development makes use of the existing road network insofar as possible. It is proposed to upgrade approximately 635 metres of existing site roads and tracks, and to construct approximately 18.7km of new access road on the site. The Proposed Development will not require the crossing of any existing streams or watercourses within the Wind Farm site, but crossings will be required along the Grid Connection.

It is proposed to construct a 110 kV electricity substation within the site, as shown in Figure 2-2. The proposed onsite electrical site is located within an area of improved agricultural grassland, approximately 462 meters south of the R363 Regional Road and approximately 400m northeast of proposed Turbine No. 18. The proposed onsite electrical substation will be served by a separate access road to the wind farm from the R363 which will allow access for maintenance to the substation by ESB / EirGrid. The footprint of the proposed onsite electrical substation compound measures approximately 1.14 hectares and will include an Eirgrid Control Building, MV Switchgear Building and the electrical substation components necessary to consolidate the electrical energy generated by each wind turbine, and export the electricity from the Wind Farm substation to the national grid

Each turbine will be connected to the on-site electricity substation via an underground 33 kV (kilovolt) electricity cable. Fibre-optic cables will also connect each wind turbine to the Wind Farm control building in the onsite electrical substation. The electricity and fibre-optic cables running from the turbines to the onsite electrical substation will be run in cable ducts approximately 1.2 metres below the ground surface, along the sides of roadways. The route of the cable ducts will follow the access track to each turbine location.

The proposed Wind Farm component of the Proposed Development will not require the crossing of any existing streams or watercourses. A total of 5 no. watercourse crossings have been identified along the proposed Grid Connection route and the underground cabling connecting the two clusters of the site. The locations of the watercourse crossings are shown in the layout drawings in Appendix 7 of the accompanying NIS. Watercourse crossings will be either be completed using a standard trefoil formation, flatbed formation over bridges or culverts, or by directional drilling, and avoids the requirement for in-stream works. Section 3.4.7.9 of the accompanying NIS presents further details on the construction methodology that will be utilised for crossings.

No routes of any natural drainage features will be altered as part of the Proposed Development. Watercourses are absent within the Wind Farm site, only occurring along the Grid Connection route, however potential impacts in relation to potential overland flow towards surface water bodies such as turloughs will nonetheless be mitigated against, as well as surface water runoff that will occur at site infrastructure that will need to be recharged locally into subsoils. This recharge water will occur close to source and can migrate vertically to groundwater below the site. There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flow/recharge. All discharges (via groundwater recharge) from the proposed works areas will be made over vegetation filters at an appropriate distance from the works areas. Buffer zones around the existing natural drainage features (turloughs and karst features for the Wind Farm site) have been used to inform the layout of the Proposed Development.

The key elements of integration with the existing drains is described in full in Section 9.4.2.1 of the detailed hydrological assessment report for the Proposed Development (included as Appendix 3 of the accompanying NIS).

Turbine locations have been selected to avoid natural watercourses and surface water features. There will be no direct discharges to natural watercourses and surface water features. All discharges from the proposed works areas or from interceptor drains will be made over vegetated ground at an appropriate distance from natural watercourse and lakes. Buffer zones around the existing natural drainage features have informed the layout of the Proposed Development and are indicated on the drainage design drawings.

Existing artificial drains in the vicinity of existing site roads will be maintained in their present location where possible. If it is expected that these artificial drains will receive drainage water from works areas, check dams will be added (as specified below) to control flows and sediment loads in these existing artificial drains. If road widening or improvement works are necessary along the existing roads, where possible, the works will take place on the opposite side of the road to the drain. A detailed drainage design for the Proposed Development is provided in Appendix 4 of the accompanying NIS.

Detailed design drawings pertaining to the Proposed Development are provided in Appendix 6 of the accompanying NIS. These detail all proposed elements of the project, including:

- Wind turbine infrastructure
- Site roads
- Spoil management plan
- Existing onsite electricity substation compound
- Site underground cabling,
- Grid connection cabling,
- Meteorological mast,
- Temporary construction compounds,
- Hedgerow clearance and replanting,
- Site activities,
- Access and transport,
- Community Benefit Fund
- Site Drainage,
- Construction phasing and timing,

All elements of the Proposed Development as described in Section 2.2.1 of this AA Screening Report have been assessed as part of this screening.

2.3 Description of the Baseline Ecological Environment

2.3.1 Ecological Multidisciplinary Walkover Surveys

Multidisciplinary ecological walkover surveys were conducted on the 13th June 2017, 14th August 2019, 15th August 2019, 02nd December 2019, 02nd July 2020 and the 03rd June 2021 in line with NRA (2009) guidelines (*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*). The surveys were conducted by David McNicholas (B.Sc., M.Sc., MCIEEM), Katie Pender, (BSc.), Patrick Ellison (BSc., MSc., ACIEEM), Cathal Bergin (BSc) and Rudraksh Gupta (BSc., MSc). All habitats within and adjacent to the proposed development site were readily identifiable during the site visit. Habitats were identified in accordance with the Heritage Council's '*Guide to Habitats in Ireland*' (Fossitt, 2000). Habitat mapping was undertaken with regard to guidance set out in '*Best Practice Guidance for Habitat Survey and Mapping*' (Smith et al., 2011). Plant nomenclature for vascular

plants follows ‘*New Flora of the British Isles*’ (Stace, 2010), while mosses and liverworts nomenclature follows ‘*Mosses and Liverworts of Britain and Ireland - a field guide*’ (British Bryological Society, 2010).

2.3.2 Otter Survey

Although there are no watercourses within the Proposed Development boundary or in close proximity to the proposed infrastructure, the grid connection route does cross a number of water courses. These were identified as providing potential habitat for otter and were subject to specialist targeted survey on the 24th September 2020, 30th March 2021 and during dedicated aquatic habitat surveys undertaken during September 2021.

The otter survey was 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. Where possible a distance of 150 up and downstream from each watercourse crossing was searched for evidence of the species. In addition to the width of the rivers/watercourses, a 10m riparian buffer (both banks) was considered to comprise part of the otter habitat (NPWS 2009). The dedicated otter survey also followed the guidance as set out in NRA (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, 2013²).

2.3.3 Habitats within the Site of the Proposed Development

A total of twelve habitats were recorded within the Proposed Development site, including;

- Improved agricultural grassland (GA1)
- Dry calcareous and neutral grassland (GS1)
- Scrub (WS1)
- Arable land (BC1)
- Turloughs (FL6)
- Eroding/upland rivers (FW1)
- Stone walls (BL1)
- Hedgerows (WL1)
- Spoil and bare ground (ED2)
- Recolonising bare ground (ED3)
- Buildings and Artificial Surfaces (BL3)

Grasslands make up a significant proportion of the habitats within the Proposed Development site. The Proposed Development site comprises large areas of improved agricultural grassland (GA1) and Dry calcareous and neutral grassland (GS1), with small areas of Wet grassland (GS4) associated with Turloughs where they are subject to long periods of groundwater inundation. Areas of Dry calcareous and neutral grassland (GS1) comprise of a mix of both semi-natural and semi-improved grasslands. Some areas mapped as Dry calcareous and neutral grassland (GS1) have been subject to intensive grazing, primarily sheep and cattle grazing; areas of Dry calcareous and neutral grassland (GS1) not subject to agricultural improvement also occur in association with patches of scrub and limestone boulders. These unimproved areas have a high affinity (92%) with the Annex I Calcareous grassland [6210] Orchid-rich calcareous grassland*³ (Perrin, 2016a⁴). Some areas corresponded to the Crested Dog’s-tail – Red Clover grassland (GL3D) community, which also has an affinity with the Annex I 6210 Orchid-rich calcareous grassland* (20.7%) (Perrin, 2016a).

² CIEEM, 2013, *Technical Guidance Series – Competencies for Species Survey*, Online, Available at: <https://cieem.net/resource/competencies-for-species-survey-css/> Accessed: 20.03.2021

³ [6210] *Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)* (*important orchid sites)

⁴ Perrin 2016a, *Community Synopsis; Briza media – Thymus polytrichus grassland GL3A*, Synopsis version: V1.0, Online, Available at: <https://www.biodiversityireland.ie/wordpress/wp-content/uploads/GL3A.pdf>, Accessed, 19.04.2021

Some farm tracks occurring through areas of rough semi-improved grassland contain small areas of recolonising bare ground (ED3). Given the extent of low intensity managed seminatural grassland habitat occurring within the study area, scrub (WS1) habitat occurs in association with much of this grassland habitat, generally as an intimate mosaic.

A number of fields within the site of the proposed development have been used for arable crop production, generally oats. Turbine T2 and areas of proposed site access roads are located within this habitat.

The lands around the mapped Feacle Lough/Turlough (FL6) are largely improved and species poor; however, areas subject to prolonged water inundation comprise of wet grassland (GS4) supporting additional species.

Stone walls (BL1) are the dominant boundary feature within the study area given the nature of the boulder strewn landscape. In places, these stone walls have become enveloped by scrub species. Hedgerows (WL1) occur throughout the study area, usually in association with stone walls.

There are also some farm buildings within the Proposed Development Site which comprised of agricultural sheds. These were categorised as Buildings and artificial surfaces (BL3).

2.3.4 Habitats along the Grid Connection Route

It is proposed to construct a 110 kV substation within the site and to connect from here via a 110 kV underground cable connection to the existing 110kV substation in Monksland approximately 11.3km east of the southern cluster of the Proposed Development site. The methodology for this grid connection is presented in Section 3.4.7.5 of the accompanying NIS.

The proposed underground cable route will leave the site of the Proposed Development to the north of Turbine no. 18 and 19, initially passing through a short section of existing access track, categorised as Buildings and Artificial Surfaces (BL1), before joining the R363, also categorised as Buildings and artificial surfaces (ED2). The underground cable route runs along the R363, and , transitioning to the R362 near the townland of Ballymullavill, travelling north along the L2047 before reaching the Athlone 110 kV substation at Monksland. All cabling crossings over watercourses will be made via directional drilling within the existing road, and consequently no direct impacts on watercourses will occur as part of these works

A number of watercourses (classified as Eroding/upland rivers (FW1)) occur along the proposed grid connection route. No watercourses occur within close proximity to any of the proposed turbine infrastructure.

A list of the watercourse crossings proposed along the Grid Connection route t is provided in Table 2-1 below. The watercourse crossing locations are shown in the detailed design drawings provided within Appendix 6 of the accompanying NIS.

Table 2-1: Existing watercourse crossings

No.	Description	ITM Coordinates (m)	
		Easting	Northing
<i>Collector Cabling Route Between Clusters</i>			
WC 1	Existing crossing	588,454	745,655
<i>Proposed Grid Connection</i>			
WC 2	Existing crossing	594,318	744,329

No.	Description	ITM Coordinates (m)	
		Easting	Northing
WC 3	Existing crossing	596,453	743,348
WC 4	Existing crossing	598,085	741,970
WC 5	Existing crossing	599,342	741,770

2.3.5 Bird Surveys

Ornithology surveys were conducted at and surrounding the Proposed Development during the period October 2018 to September 2021. Surveys were carried out in accordance with current NatureScot guidelines (SNH, 2017), which are designed to facilitate the collection of robust baseline ornithology data, allowing a full impact assessment of onshore wind farms for the purposes of both EIA and Appropriate Assessment. A full description of the surveys undertaken is provided in Chapter 7 of the EIAR and associated Technical Appendices (included as Appendix 5 of the accompanying NIS), with the suite of surveys undertaken summarised below:

- Flight activity surveys undertaken over 3 years at 2 Vantage Points (VPs) at the Northern Cluster and 4 VPs at the Southern Cluster (winter 2018/19, summer 2019, winter 2019/20, summer 2020, winter 2020/21 and summer 2021);
- Breeding wader surveys undertaken within the Southern Cluster plus a 500 m buffer (summer 2019, 2020 and 2021);
- Breeding raptor surveys undertaken within the Proposed Development site plus a 2 km buffer (summer 2019, 2020 and 2021);
- Swan and goose feeding distribution surveys undertaken within the Proposed Development site plus a 1 km buffer (winter 2018/19, 2019/20 and 2020/21);
- Greenland white-fronted goose *Anser albifrons flavirostris* roost surveys at Lough Croan (winter 2019/20 and 2020/21); and
- European golden plover *Pluvialis apricaria* nocturnal foraging surveys undertaken within the Northern Cluster (winter 2019/20).

Data relating to previous surveys at the site between winter 2008/09 and winter 2017/18 were reviewed (see bird survey reports, provided as Appendix 5 of the accompanying NIS). The pre-existing data provide useful context and helped identify what species were likely to be present and the survey methodology that was required. However, given their age (NatureScot (SNH, 2017) guidelines state that data older than five years should not be used for impact assessment) and the differences in the methods used they have not been used to inform the assessment presented in this report, which is instead based on the survey data collected between October 2018 and September 2021.

2.3.5.1 Results pertaining to Special Conservation Interest (SCI) Bird Species of European Sites

The baseline ornithological interest of the Proposed Development site and surrounding area has been fully described within Appendix 5 of the accompanying NIS. Table 2-2 summarises the results from the baseline surveys undertaken between October 2018 and September 2021 for SCI species associated with each SPA considered in this AA Screening Report (see Section 3 of this report) recorded during the surveys.

A brief summary of pre-existing survey data is also shown in Table 2-2 alongside the current survey data for all species recorded during the 2018-21 surveys. Historical surveys also recorded the additional SCI species northern shoveler (winters 2014/15 and 2016/17), tufted duck (winter 2014/15), little grebe (winter 2014/15) and black-tailed godwit (winter 2014/15). Although it is not always clear from the reports, it appears these species were only recorded outside the survey area used for the 2018-21

surveys (i.e. > 500 m from the Proposed Development site, which is the recommended survey area given by the current NatureScot guidelines; SNH, 2017). Therefore, these SCI species are not included in Table 3-1 as beyond 500m there is no pathway via which impacts from the Proposed Development could occur, i.e., the intervening distance is so great that no impacts are likely.

Note that no evidence of any of the species listed in Table 2-2 breeding within the study area was recorded during the 2018 – 2021 surveys.

2.3.5.2 Potential Sources of Significant Effects on SPA Bird Populations within the Likely Zone of Influence

This section identifies the sources of potentially significant effects that could occur on SPA bird populations within the likely zone of influence during the construction, operation and decommissioning of the Proposed Development, and the pathways through which effects could occur.

Sources of potentially significant effects include:

- habitat loss or damage (permanent and temporary) due to construction of the Proposed Development;
- inadvertent destruction of nests during construction and decommissioning;
- disturbance to birds during construction and decommissioning due to vehicular traffic, operating plant and the presence of construction workers;
- disturbance to birds due to the operation of the wind turbines (including barrier effects), vehicular traffic and the presence of people during operation; and
- mortality of birds caused by collisions with turbine blades and other infrastructure during operation.

The pathways to such effects include:

- where there is hydrological/hydrogeological connectivity between the Proposed Development and the relevant SPA or between the Proposed Development and other wetland sites used by SPA SCI species (see Section 2.3.6); and
- where there is ecological connectivity between the Proposed Development and the relevant SPA (e.g. where SPA SCI birds are likely to use the habitats at the Proposed Development, or another area affected by the Proposed Development). The rationale behind identifying ecological connectivity is described further in Section 3.1.

Note that the Proposed Development is not located directly within any SPA and so there is no pathway for direct effects on any SPA itself.

Table 2-2 - Summary of baseline for SCI species recorded during field surveys

SCI species	Baseline
Black-headed gull <i>Chroicocephalus ridibundus</i>	<p><u>Current survey data</u></p> <ul style="list-style-type: none"> ➤ Northern Cluster flight activity surveys: combined total⁵ of 24 birds (secondary species data), winter 2018/19; 2 birds (secondary species data) breeding season 2019; combined total of 1,956 (max. flock size 500, with the vast majority of sightings at Thomas Street Turlough, which is located 948 m from the nearest proposed turbine location) (secondary species data), winter 2019/20; 13 flights, combined total of 41 (max. flock size 10) (primary target species data) breeding season 2020; combined total of 334 (max. flock size 60) (secondary species data) winter 2020/21; combined total of 51 birds (max. flock size 12) (primary target species data) breeding season 2021. ➤ Southern Cluster flight activity surveys: combined total of 602 (max. flock 150) (secondary species data), winter 2018/19; combined total of 21 (max. of 2 birds) (secondary species data), breeding season 2019; combined total of 339 (max. of 42 birds) (secondary species data), winter 2019-20; 19 flights, combined total of 44 (max. flock size 8), (primary target species data) breeding season 2020; combined total of 312 (max. flock size 60) (secondary species data) winter 2020/21; combined total of 97 birds (max. flock size 8) (primary target species data) breeding season 2021. The majority of sightings were associated with Feacle Turlough, which is located 730 m from the nearest proposed turbine location. <p><u>Pre-existing survey data</u></p> <ul style="list-style-type: none"> ➤ Recorded during winter 2014/15 and 2016/18 only.
Common coot <i>Fulica atra</i>	<p><u>Current survey data</u></p> <ul style="list-style-type: none"> ➤ Northern Cluster flight activity surveys: none recorded. ➤ Southern Cluster flight activity surveys (all records as secondary target species): 1 record of 1 bird (breeding season 2020), 1 record of 2 birds (winter 2020/21) and 2 records of a combined total of 6 birds (breeding season 2021).

⁵ The combined total numbers of birds refers to the sum of the number of birds recorded each month across each survey season.

SCI species	Baseline
	<p><u>Pre-existing survey data</u></p> <ul style="list-style-type: none"> ➤ Recorded during winter 2014/15 only.
<p>Common scoter <i>Melanitta nigra</i></p>	<p><u>Current survey data</u></p> <ul style="list-style-type: none"> ➤ Northern Cluster flight activity surveys: none recorded. ➤ Southern Cluster flight activity surveys: 1 record (as secondary target species) of 1 bird (breeding season 2019). <p><u>Pre-existing survey data</u></p> <ul style="list-style-type: none"> ➤ Not recorded in historical surveys.
<p>Eurasian teal <i>Anas crecca</i></p>	<p><u>Current survey data</u></p> <ul style="list-style-type: none"> ➤ Northern Cluster flight activity surveys: none recorded. ➤ Southern Cluster flight activity surveys (all records as secondary target species): 3 records of a combined total of 36 birds (winter 2018/19), 2 records of a combined total of 7 birds (breeding season 2019) and 3 records of a combined total of 7 birds (winter 2019/20). <p><u>Pre-existing survey data</u></p> <ul style="list-style-type: none"> ➤ Recorded in all years.
<p>Eurasian wigeon <i>Mareca penelope</i></p>	<p><u>Current survey data</u></p> <ul style="list-style-type: none"> ➤ Northern Cluster flight activity surveys: one record (as secondary target species) of flock of 40-50 (winter 2019/20). One record (as primary target species) of flock of 35 (winter 2020/21). ➤ Southern Cluster flight activity surveys: two records (as secondary target species) (winter 2019/20), max. flock size 57. Seven records (as primary target species) with combined total of 291 (max. flock size 120) (winter 2020/21), all of which were observed flying over Feacle Turlough, which is located 730 m from the nearest proposed turbine location.

SCI species	Baseline
	<p><u>Pre-existing survey data</u></p> <ul style="list-style-type: none"> ➤ Recorded in all years.
European golden plover	<p><u>Current survey data</u></p> <ul style="list-style-type: none"> ➤ Northern Cluster flight activity surveys: 2 flights (max. flock size 49) (winter 2018/19); 5 flights with a combined total of 140 (max. flock size 50) (winter 2019/20); 4 flights with a combined total of 107 (winter 2020/21). Most of the observations were associated with Thomas Street Turlough, which is located 948 m from the nearest proposed turbine location. ➤ Southern Cluster flight activity surveys: 2 flights (combined total of 11) (winter 2018/19); 3 flights (combined total of 36) (winter 2019/20); 5 flights with a combined total of 122 (max. total of 40) (winter 2020/21). The majority of the observations were associated with Feacle Turlough, which is located 730 m from the nearest proposed turbine location. ➤ European golden plover nocturnal foraging surveys: max. of 5 birds at the northern cluster (surveys were not carried out at the southern cluster as the habitats were judged to be less suitable for golden plover than those at the northern cluster and the relatively rough topography and terrain present at the Southern Cluster was considered a health and safety risk to surveyors working in such terrain at night). <p><u>Pre-existing survey data</u></p> <ul style="list-style-type: none"> ➤ Recorded in all years.
Greenland white-fronted goose	<p><u>Current survey data</u></p> <ul style="list-style-type: none"> ➤ Swan and goose feeding distribution surveys: only recorded in one monthly survey (179 in February 2021 with three separate flocks grazing in fields surrounding Lough Croan, which is located beyond the 1 km survey buffer (see Section 2.3.5) at 1.5 km distance from the Proposed Development). ➤ Greenland white-fronted goose roost surveys: irregularly recorded at Lough Croan, but with a peak of 267 in January 2021. Birds did not overfly either the Northern or Southern Clusters in any survey year, which lie to the south of Lough Croan (i.e. all flights were of birds heading east-west into or away from Lough Croan or north from Lough Croan.) ➤ Northern Cluster flight activity surveys: two flocks in winter 2018/19 (5 & 14); one flock of 72 in winter 2019/20 outside the Proposed Development site leaving Lough Croan heading towards the River Suck Callows; none in winter 2020/21.

SCI species	Baseline
	<p>➤ Southern flight activity surveys: none in winter 2018/19; none in winter 2019/20; one flock of 50 in winter 2020/21 recorded outside the Proposed Development site.</p> <p><u>Pre-existing survey data</u></p> <p>➤ Not recorded at the Proposed Development site but recorded in surrounding area (in 2013 and 2016 only, with no identifiable trend in numbers of over the course of the surveys).</p>
<p>Mallard <i>Anas platyrhynchos</i></p>	<p><u>Current survey data</u></p> <p>➤ Northern Cluster flight activity surveys: 2 records (as secondary target species) of a total of 6 birds (winter 2019/20);</p> <p>➤ Southern Cluster flight activity surveys (all records as secondary target species): 2 records of a combined total of 7 birds (winter 2018/19), 7 records of a combined total of 45 birds (breeding season 2019), 2 records of a combined total of 37 birds (winter 2019/20), 8 records of a combined total of 17 birds (breeding season 2020), 9 records of a total of 22 birds (winter 2021/21) and 22 records of a total of 123 birds (breeding season 2021).</p> <p><u>Pre-existing survey data</u></p> <p>➤ Recorded in winter 2014/15 and 2016/17 only.</p>
<p>Northern lapwing <i>Vanellus</i></p>	<p><u>Current survey data</u></p> <p>➤ Northern Cluster flight activity surveys: 11 flights with combined total of 126 (max. flock size of 26) (winter 2018/19); 1 flock of 10 birds (winter 2019/20); 3 flights with combined total of 60 (max. flock size 40) (winter 2020/21).</p> <p>➤ Southern Cluster flight activity surveys: 6 flights with a combined total of 69 birds (max. flock size 35) (winter 2019/20); 8 flights with a combined total of 313 (max. flock size 50) (winter 2020/21); combined total of 60 birds (max. flock size 34) (primary target species data) breeding season 2021. Most recorded activity focussed around Feacle Lough Turlough, which is located 730 m from the nearest proposed turbine location.</p>

SCI species	Baseline
	<p><u>Pre-existing survey data</u></p> <ul style="list-style-type: none"> ➤ Recorded in all years.
Whooper swan <i>Cygnus</i>	<p><u>Current survey data</u></p> <ul style="list-style-type: none"> ➤ Swan and goose feeding distribution surveys: max. 189 (March 2021). Two main foraging areas were regularly used: fields near Lough Croan, approximately 1 km north of the Northern Cluster and the Ballyglass River located c. 750 m to the north of the Southern Cluster. ➤ Northern Cluster flight activity surveys: 14 flights with combined total of 58 (winter 2020/21). Only a single flock of four birds was recorded flying through the proposed development site with all others recorded outside the Proposed Development site. ➤ Southern Cluster flight activity surveys: 8 flights with combined total of 35 (winter 2020/21). None of the birds were recorded flying through the Proposed Development site. <p><u>Pre-existing survey data</u></p> <ul style="list-style-type: none"> ➤ Recorded in all years, mostly in small numbers and often irregularly.

2.3.6 Hydrological connectivity identified between the proposed project and downstream aquatic dependant European Sites within the likely zone of influence

The baseline hydrology of the site and surrounding area has been fully assessed by Hydro-Environmental Services (HES) on behalf of MKO; the detailed assessment carried out by HES has been reported on within the detailed hydrological assessment report 'Hydrology and Hydrogeology' prepared for the proposed development; this document has been reviewed and relied upon in the assessment within this AA Screening Report. A relevant summary of the information contained within the detailed hydrological assessment (Appendix 3 of the accompanying NIS) in relation to the hydrology of the Site and European Sites is provided below.

2.3.6.1 Regional and Local Hydrology

'With respect to regional hydrology, the proposed Wind Farm site is located primarily within the Upper Shannon (26D) catchment, with a small section to the southeast of the Wind Farm site within the Upper Shannon (26G) catchment, all within Hydrometric Area 26 (Upper Shannon) of the Irish River Basin District.

On a local scale, the proposed Wind Farm site (Northern and Southern Clusters) is broadly contained within the River Suck sub-catchment (Suck_SC_090), with a small section of the Southern Cluster (T19 & T20) contained within the Cross River sub-catchment (Shannon[Upper]_SC_100). The proposed Grid Connection route is mostly located within the Cross River sub-catchment (Shannon[Upper]_SC_100), with a small section close to Athlone located in the Shannon[Upper]_SC_090 sub-catchment. These surface water catchment areas are illustrated in Figure 9-3.

The River Suck is located ~3.5km west of the Southern Cluster area, and ~3.9km west of the Northern Cluster. The River Suck flows south through the village of Ballyforan, west of Dysart, continues south through the town of Ballinasloe before turning southeast and discharging to the River Shannon at Shannonbridge, ~20km south of the Southern Cluster.

The River Suck is within the OPW Suck Drainage District. No Arterial Drainage Schemes occur within the Water Study Area defined on Figure 9-1.

The Cross River is situated ~3.2km east of the nearest Southern Cluster turbines and it drains a catchment that is located east of Lough Croan/Cuilleenirwan Lough and generally south of Lough Fuinshinagh. The headwaters of the Cross River is on the western slope of a small hill (~80m OD) in the townland of Kilcar and is mapped as a series of smaller water features near Dooloughan Lough. The most southeastern turbines of the Southern Cluster area also drain towards this river, possibly via Corkip Lough before the small tributaries of the Cross River emerge from this ephemeral water feature.

Water levels in the River Suck are measured at station 26005 and generally range in elevation between 42.6-45.4 m OD. Water levels in the River Shannon are measured in Athlone at station 26027 and range in elevation between 32.75 m OD to ~36 m OD. Water levels are not measured in the Cross River, however, the Cross River reaches a confluence with the River Shannon ~2km downstream of station 26027. Given this, and the upstream topography data, water levels in the Cross River are likely

~35 m OD near Athlone and perhaps 40-45 m OD upstream, nearer the Southern Cluster of the Wind Farm Site.

The regional area between Roscommon town and just south of Dysart is distinctively void of mapped river channels with the main drainage being provided by the Ballyglass and Cross Rivers. The surface hydrological network does increase towards the margins of this regional area, with channels emerging 1-2km east of the Suck, which then drains to the River Suck.

The orientation of the Cross River suggests that drainage to the west and northwest of this channel (i.e. the Northern and Southern Cluster areas) is hydraulically separated from the hydrology to the east (i.e. Lough Funshinagh. This point is underpinned by water level data presented in Sections 9.3.7.10 and 9.3.7.11). This is also supported by the topography, with a series of north-south orientated ridges spanning between the townlands of Eskerbaun northwest to Kilmore.'

A local hydrology map is provided within the detailed hydrological assessment report (included as Appendix 3 to the accompanying NIS).

2.3.6.2 Likely Significant Effects on European Sites

Section 9.4.2.9 of the detailed hydrology assessment (included as Appendix 3 to the accompanying NIS) assesses the potential for effects on European Sites as a result of a deterioration in water quality as a result of the Proposed Development. A summary of the assessment for all European Sites within 15km of the Proposed Development site is provided below (no hydrological connectivity was identified to any European Sites in excess of 15km).

2.3.6.2.1 Groundwater Dependant European Sites

The following potential pathways for effect were identified as a result of construction works required for the Proposed Development:

- Alteration of groundwater volumes through alterations of recharge patterns;
- Alteration of groundwater flowpaths which feed the turloughs through excavation/emplacement of turbine infrastructure; and,
- Alteration of groundwater quality due to silt, cementitious material/hydrocarbons entering the groundwater system below the Wind Farm site.

Ballynamona Bog and Corkip Lough SAC

'Corkip Lough is situated ~1km southeast of T20 and ~1.4km southeast of T19. The site investigation data near T19 and T20 indicates that there is >10m of subsoil overburden at these turbine locations, providing a considerable thickness of protection to the underlying groundwater aquifer. The local subsoil (at T19 and T20) is logged as sandy gravelly CLAY, sandy GRAVEL and clayey sandy COBBLES. Maximum groundwater levels near Corkip Lough range between 57.01 – 58.8 m OD in Winter. There is a very shallow valley on the eastern side of Cam Hill which slopes in a south-easterly direction. T19 and T20 are situated just inside the boundaries of this valley. The shallow valley broadly trends in the direction of Corkip Lough, therefore groundwater from near T19/T20 will likely drain towards Corkip Lough. The Ballynamona bog is artificially drained around its perimeter which likely partially isolates it hydraulically from the surround regional groundwater flow systems. These bogs are also normally hydraulically isolated from the surrounding groundwater regime by an impermeable clay/marl layer which underlies the bog. For these reasons, and combined with the considerable thickness of subsoil present below the proposed turbine locations, the bog section of this SAC is not considered further as a potential receptor'.

Lough Croan Turlough

'Groundwater flows towards Lough Croan SAC from the Northern Cluster will not occur. The collated groundwater data indicate that the high water level in Lough Croan is higher than that recorded in Gortaphuill turlough (adjacent to T4), and that data, combined with the local topography and other recorded water level data (EPA well at Turrock and well W3) demonstrates that Lough Croan is not

hydraulically connected to groundwater flows below the proposed Northern Cluster of the Seven Hills Wind Farm site. Therefore, none of the impact pathways (listed above) can occur at Lough Croan Turlough SAC/SPA/pNHA in respect of the Proposed Development’.

Four Roads Turlough SAC/SPA

Groundwater levels at Four Roads Turlough SAC range between 47.8 -48.6 m OD from the historical data, with maximum water level estimated at ~51m OD (GSI GWFlood Data). Groundwater flow from near turbines T1 and T2 are >76 m OD, with water levels recorded between Four Roads and the Northern Cluster of 61.6-65.5 m OD. There are 2 no. watercourses which emerge between Four Roads turlough and the Northern Cluster and any groundwater which may flow north/northwest from the site is more likely to emerge as baseflow in these, however the possibility of groundwater reaching Four Roads Turlough cannot be discounted.

Lough Funshinagh SAC

‘Lough Funshinagh SAC is situated 6.2km northeast of the Northern Cluster, with a maximum Winter water level of 67.35 m OD. The Lough Funshinagh SAC/pNHA is situated within a separate mapped groundwater body to the majority of the proposed development site’. The ‘...available groundwater levels for Lough Funshinagh show Funshinagh is hydraulically upgradient of the most north/northwestern turlough to the Northern Cluster (Lough Croan) for ~60% of the monitoring period, notably when water levels were at their highest. These data, coupled with the elevated topography to the northwest of the Northern Cluster show the prevailing hydraulic gradient within the site is west/southwest towards the River Suck, 3-4km west at ~42m OD, not northeast towards Lough Funshinagh. There is also elevated ground (northwest-southeast ridge line) between Lough Funshinagh and Lough Croan and also the Northern Cluster of proposed turbines. Surface water emerges from the eastern flank of this ridge to form the Lysterfield stream, and this stream flow into Lough Funshinagh to the east. The Lysterfield stream water levels are ~72m OD, and are significantly higher than any water levels recorded at Lough Croan or below the wind farm footprint. Given the high recorded water levels in the Lysterfield stream (between Lough Croan and Lough Funshinagh) there is catchment divide located between those water bodies, and based on this observation, there can be no hydraulic connection between the Wind Farm Site and Lough Funshinagh. As such, none of the impact pathways (listed above) can occur at Lough Funshinagh SAC/pNHA in respect of the Proposed Development’.

Impact Assessment – Lisduff Turlough SAC

‘Lisduff Turlough SAC is situated 7km north of the Northern Cluster. The historical data gathered from Lisduff turlough (2016-2018) shows a maximum winter water level of ~49 m OD. An area of high ground exists between the Seven Hills Wind Farm site and the Lisduff Turlough SAC at Correal (133 m OD) and Glenfin (150m OD). This area of high ground wraps southern and eastern flanks of the Lisduff turlough SAC catchment and will act as a hydraulic boundary separating this distal SAC from the Northern or Southern Clusters. As such, none of the impact pathways (listed above) can occur at Lisduff Turlough SAC in respect of the Proposed Development’.

Impact Assessment – Castlesampson Esker SAC (turlough)

‘The Castlesampson Esker is included, as a turlough is noted within its qualifying interests, however the turlough makes up a very small area of the SAC and is situated within an enclosed area of esker deposits. The SAC is situated ~4km south of the Southern Cluster. The catchment of the turlough is most likely defined by the surrounding sand and gravel deposits. The regional groundwater flow from the Proposed Development Site is not in the direction of the Castlesampson Esker SAC. As such, none of the impact pathways (listed above) can occur at Castlesampson Esker SAC (turlough) in respect of the Proposed Development.

There are no mapped turloughs, or designated turlough sites downstream or in close proximity to the proposed Grid Connection route. Therefore, proposed works along the Grid Connection route will not impact on turloughs or designated turlough sites’.

2.3.6.2.2 Surface Water Dependant European Sites

Lough Ree SAC

‘The Lough Ree SAC is principally fed by the River Shannon, likely with a moderate amount of groundwater inflow around its margins. Water levels in Lough Ree are generally at ~35 m OD. The catchment to Lough Ree (Upper Shannon Catchment) measures ~1,500 km². The available groundwater data (c.f. Section 9.3.7) does not indicate any potential groundwater flow towards Lough Ree, it is east of Lough Funshinagh which has already been shown to be upgradient of the Northern and Southern Cluster turloughs in Winter. There are no surface waterbodies which drain from the Proposed Development site, and no surface water bodies which proximal to the Proposed Development site which drain towards Lough Ree’.

River Shannon Callows SAC and SPA

‘The River Shannon Callows is situated 12km east of the Proposed Development site. The only potential pathway to the River Shannon Callows SAC is through groundwater base flow to a nearby watercourse proximal to the Proposed Development site (Cross, Killeglan, Ballyglass and Suck rivers) which then discharge to the River Shannon. There will be no surface water drainage from the site, all proposed drainage is via recharge and groundwater flowpaths’.

River Suck Callows SPA

‘The River Suck Callows SPA is mapped 2.4km west of the Proposed Development site. Again, there is no surface water drainage from the site which could impact on surface water quality to the SPA. The site is designated for the presence of bird species (Whooper Swan, Golden Plover etc) as well as for wetlands’.

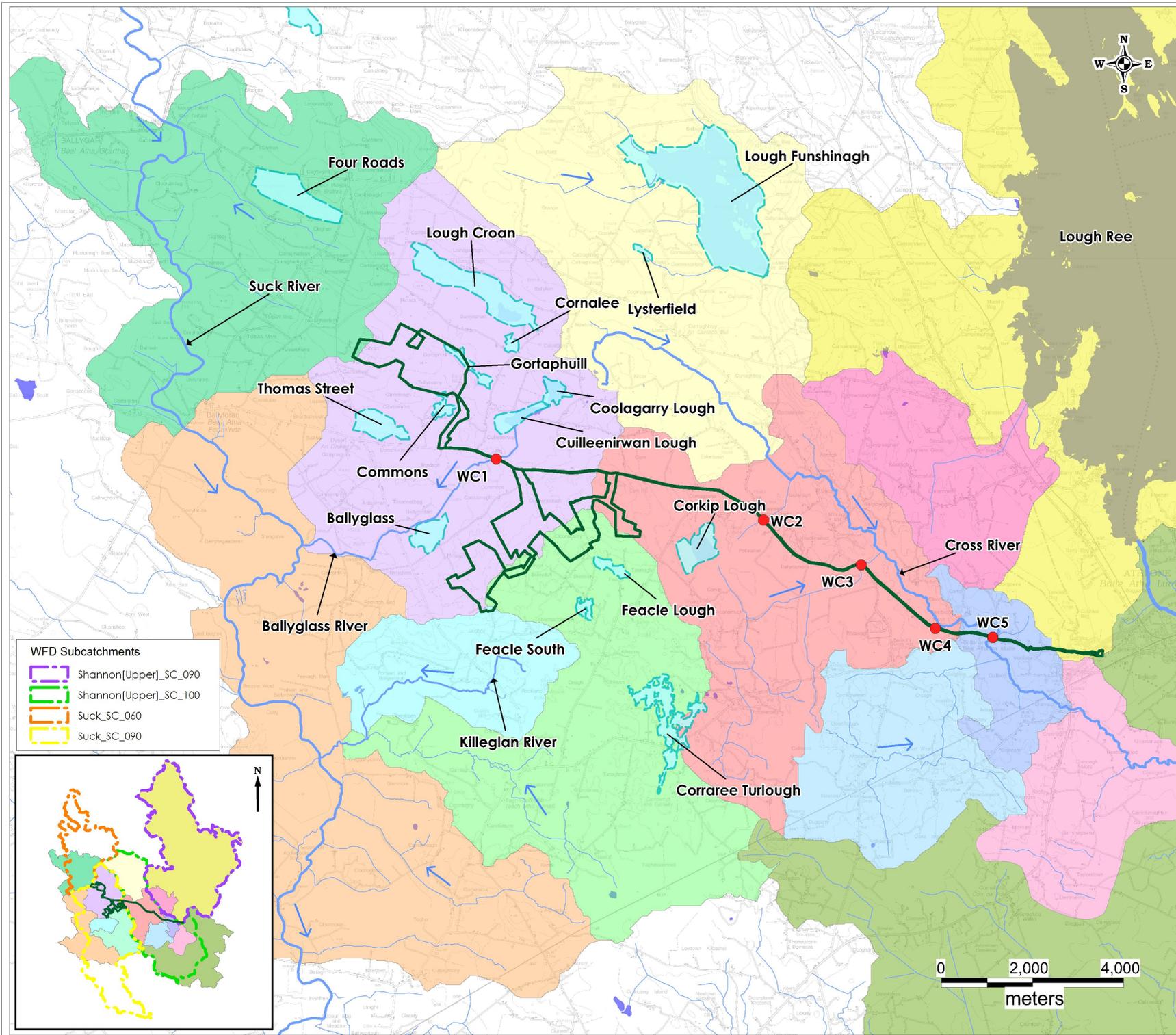
2.3.6.2.3 Non hydrologically dependant European Sites

Killeglan Grassland SAC

‘The Killeglan Grassland SAC is the only non-water dependent designated site near the Northern and Southern Clusters of the Wind Farm Site and the proposed Grid Connection route.

Groundwater flow from the Southern Cluster will drain in the direction of the Killeglan Grassland SAC but will be significantly below ground level at the SAC. There are no surface water channels which could hydraulically connect the Proposed Development Site and the Killeglan Grassland SAC. The qualifying interest of the SAC, Orchid rich grassland, are not reliant on surface water or groundwater.

There are no identified pathways between the Proposed Development site and the Killeglan Grassland SAC’.



Legend

- EIAR Site Boundary
- Watercourses
- Turloughs
- Existing Watercourse Crossings (WC1-WC5)

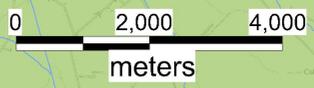
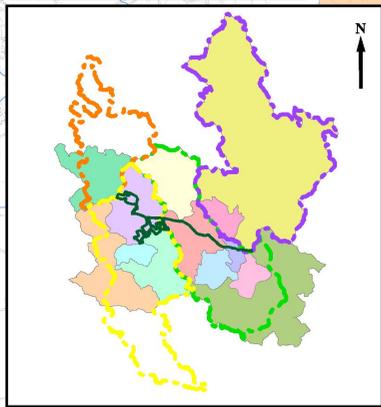
WFD River Sub-basin

- BALLYBAY_010
- BALLYGLASS_010
- CROSS (ROSCOMMON)_010
- CROSS (ROSCOMMON)_020
- CROSS (ROSCOMMON)_030
- CROSS (ROSCOMMON)_040
- KILLEGLAN TRIB NORTH_010
- KILLEGLAN_010
- MIHANBOY_010
- SHANNON (Upper)_110
- SHANNON (Upper)_120
- SUCK_120
- SUCK_130



WFD Subcatchments

- Shannon[Upper]_SC_090
- Shannon[Upper]_SC_100
- Suck_SC_060
- Suck_SC_090



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Client: Energia Renewables ROI Ltd	
Job: Seven Hills WF, Co. Roscommon	
Title: Local Hydrology - Grid Connection with Watercourse Crossings Map	
Figure No:	2-3
Drawing No: P1500-0-0422-A3-904-0A	
Sheet Size: A3	Project No: P1500-0
Scale: 1:80,000	Drawn By: GD
Date: 20/04/2022	Checked By: MG

3. IDENTIFICATION OF RELEVANT EUROPEAN SITES

3.1 Identification of the European Sites within the Likely Zone of Impact

The following methodology was used to establish which European Sites are within the Likely Zone of Impact of the proposed development:

- 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) on the 30/05/2022. The datasets were utilized to identify European Sites which could feasibly be affected by the Proposed Development.
- Environmental Protection Agency (EPA) catchment mapping was used to establish or discount potential hydrological connectivity between the site of the Proposed Development and any European Sites. The hydrological catchments are also shown in Figure 3-1.
- In relation to Special Areas of Conservation (SACs), all SACs within a distance of 15km surrounding the Proposed Development site were identified and are shown on Figure 3-1. In addition, the potential for pathways for effect on European Sites at distances of greater than 15km from the Proposed Development was also considered, but no hydrological connection to any such sites and no other potential pathway for significant effects on such sites exists.
- In relation to Special Protection Areas (SPAs), in the absence of any specific European or Irish guidance in relation to such sites, the NatureScot (formerly SNH) Guidance (SNH, 2016) was consulted. This document provides guidance in relation to the identification of ecological connectivity between the Proposed Development sites and Special Protection Areas. The guidance is also relevant to Ireland for species that are also present in Ireland. The distances for core and maximum dispersal and foraging ranges are drawn from a literature review that examined ranging behaviour across a variety of locations in Britain, Ireland and beyond, not just in Scotland (Pendlebury *et al.* 2011). The guidance takes into consideration the distances species may travel beyond the boundary of relevant SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects. It goes on to state that "*in most cases the core range should be used when determining whether there is connectivity between the proposal and the qualifying Interests*". Where SPAs are at greater distance from the Proposed Development than the core foraging ranges for their listed SCI species, there is no likely ecological connectivity to the development and so the SPAs are outside the likely Zone of Impact. The only rare exception is where there is a lack of suitable foraging sites near an SPA, prompting an SCI species to travel further. This situation is not considered applicable for the suite of SPAs considered in this document, as they either provide suitable foraging habitat for their SCI species within the relevant SPAs or suitable foraging habitat is widely available within the immediately surrounding area.

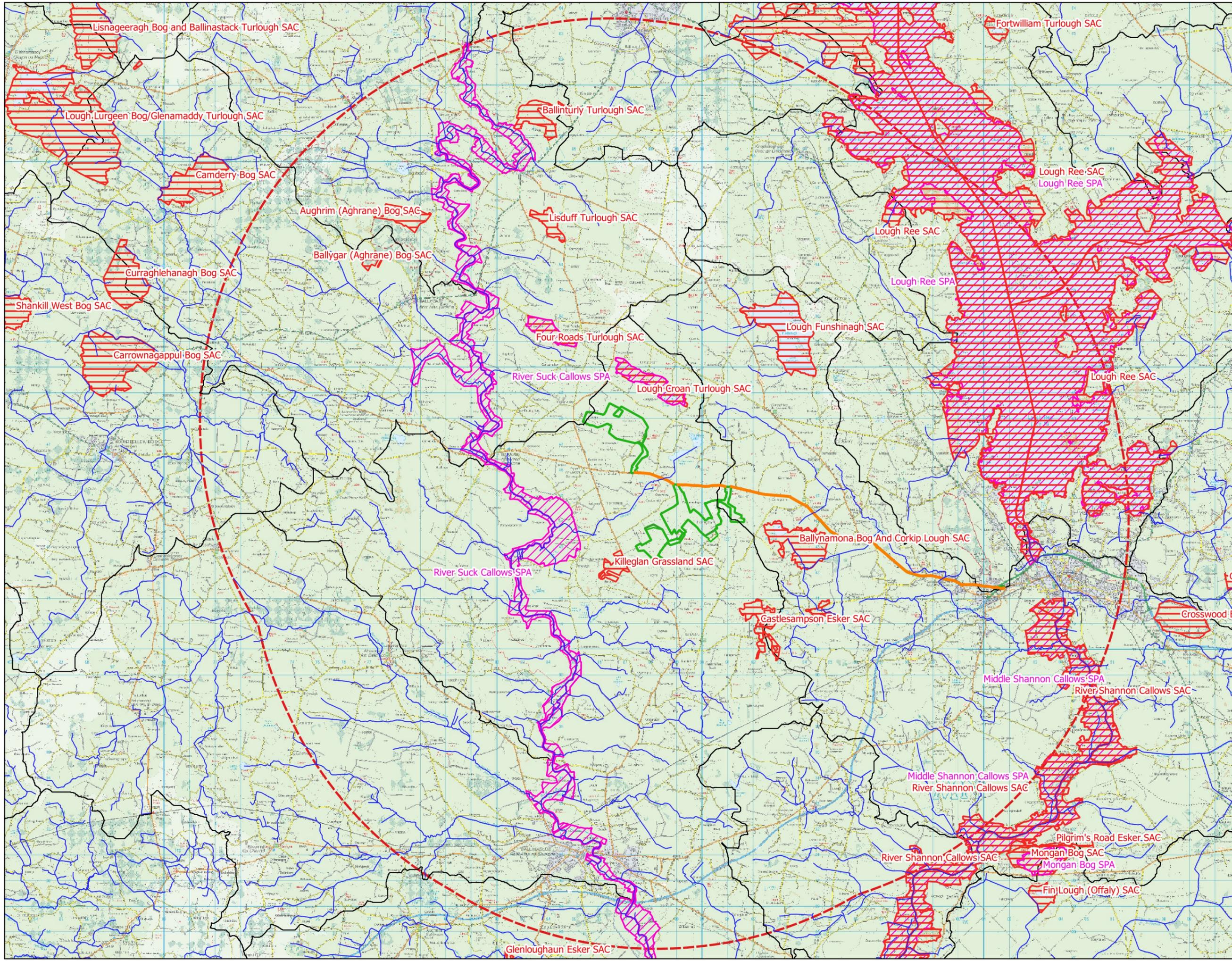
According to the NatureScot guidance, the core foraging distances of wintering grey geese (greylag goose and pink-footed goose) from SPAs is 15-20 km. This represents the largest foraging range of all the species listed in this guidance document. It is acknowledged that information on core foraging ranges is not available for all SCI

species. In such cases, the 15-20 km core foraging range for grey geese has been adopted as a precautionary approach.

As stated above, all European Sites within a distance of 15km surrounding the development site were identified and are included in the screening assessment. In addition, the potential for ecological connectivity with SPAs at distances of greater than 15km from the Proposed Development was also considered. Mongan Bog SPA (Site Code: 004017) is located 17 km from the Proposed Development site and is designated only for Greenland white-fronted goose. As the core foraging range for this species is 5-8 km (SNH, 2016), which is considerably less than the core foraging range of its only SCI species, this SPA is not ecologically connected to the Proposed Development site. The next closest SPA to the Proposed Development is River Little Brosna Callows (Site Code: 004086), which is located c. 30 km from the Proposed Development site. This is well beyond the likely regular dispersal or foraging distance for any SCI species (as stated above, the largest core foraging range for any terrestrial bird species is 15-20 km).

Thus, any SPAs beyond 15 km from the Proposed Development site have not been considered further within this screening assessment.

- Table 3-1 provides details of all relevant European Sites as identified in the preceding steps and assesses which are within the likely Zone of Impact. The assessment considers any likely direct or indirect impacts of the Proposed Development, both alone and in combination with other plans and projects, on European Sites by virtue of the following criteria: 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 Screening 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 30/05/2022. Figure 3-1 shows the location of the proposed development in relation to all European sites within 15km of the Proposed Development.
- Where potential pathways for likely Significant Effect are identified, the site is included within the Likely Zone of Impact and further assessment is required.



- ### Map Legend
- EIAR Boundary
 - Grid Connection Route
 - ZoI from Wind Farm Site
 - River
 - Waterbodies (WFD)
 - Hydrological Subcatchments (WFD)
 - Special Area of Conservation (SAC)
 - Special Protection Area (SPA)

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Drawing Title	
European Sites within the Zone of Influence	
Project Title	
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Table 3-1 Identification of European sites within the Likely Zone of Impact

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
Special Areas of Conservation (SAC)			
<p>Ballynamona Bog And Corkip Lough SAC</p> <p>[002339]</p> <p>Distance: 0.79km east / 0.2km south</p>	<ul style="list-style-type: none"> ➤ [3180] Turloughs* ➤ [7110] Active raised bogs ➤ [7120] Degraded raised bogs still capable of natural regeneration ➤ [7150] Depressions on peat substrates of the Rhynchosporion ➤ [91D0] Bog woodland 	<p>Detailed conservation objectives for this site, (Version 1, September 2016⁶), were reviewed as part of the assessment and are available at:</p> <p>www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO0EuropeanSite02339.pdf</p> <p>The conservation objectives for each of the listed QIs relates to either maintaining or restoring the favourable conservation condition of the habitats or species for which the SAC has been designated.</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>The Proposed Development is within the same hydrological sub-catchment as the SAC. Given the potential for groundwater connectivity between the Proposed Development and the SAC, as identified in Section 2.2.2.3.2 above, a potential pathway for indirect hydrological/pollution related impact on the SAC exists during the construction, operation, and decommissioning phases. The potential for impact, via the identified pathway, cannot be excluded in the absence of mitigation.</p> <p>No other potential pathway for significant effect on this SAC exists.</p> <p>Consequently, the SAC is <i>within</i> the Likely Zone of Impact and further assessment is required</p>

⁶ NPWS (2016) Conservation Objectives: Ballynamona Bog and Corkip Lough SAC 002339. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
<p>Killeglan Grassland SAC [002214]</p> <p>Distance: 0.62km south-west/ 3.08km south-west</p>	<p>➤ [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (*important orchid sites)</p>	<p>Detailed conservation objectives for this site (Version 1, June 2018⁷), were reviewed as part of the assessment and are available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002214.pdf</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site. There will be no land take or possibility of encroachment into the SAC as part of the construction, operational or decommissioning phases of the proposed development; therefore no pathways for direct effects on the QI habitats of the SAC exist.</p> <p>The grassland habitat for which the site is designated is terrestrially based; given the proximity to the site of the proposed development the potential for deterioration of QI habitat resulting from project emissions during the construction, operation and decommission phases, has been identified on a precautionary basis. The potential for impact, via the identified pathway, cannot be excluded in the absence of mitigation.</p> <p>No other potential pathway for significant effect on this SAC exists.</p> <p>Consequently, the SAC is <i>within</i> the Likely Zone of Impact and further assessment is required</p>
<p>Lough Croan Turlough SAC [000610]</p>	<p>➤ [3180] Turloughs*</p>	<p>Detailed conservation objectives for this site (Version 1, January 2018⁸), were reviewed</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site. There will be no land take or possibility of encroachment into the SAC as part of the</p>

⁷ NPWS (2018) Conservation Objectives: Killeglan Grassland SAC 002214. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

⁸ NPWS (2018) Conservation Objectives: Lough Croan Turlough SAC 000610. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
<p>Distance: 1.03km north / 2.82km north-west</p>		<p>as part of the assessment and are available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000610.pdf</p>	<p>construction, operational or decommissioning phases of the proposed development; therefore no pathways for direct effects on the QI habitats of the SAC exist.</p> <p>The detailed hydrological assessment carried out for the proposed development concluded that there is no potential for groundwater connectivity between the Proposed Development and the SAC, as described in Section 2.2.2.3.2 above. Therefore, no potential pathway for significant indirect hydrological/pollution effects on the SAC exists during the development construction, operation, or decommissioning phases.</p> <p>No other potential pathways for significant effect on this SAC exists.</p> <p>Consequently, the SAC is <i>outside</i> the Likely Zone of Impact and no further assessment is required</p>
<p>Castlesampson Esker SAC [001625]</p> <p>Distance: 2.75km south-east/ 2.5km south</p>	<ul style="list-style-type: none"> > [3180] Turloughs* > [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia) (*important orchid sites) 	<p>Detailed conservation objectives for this site (Version 1, October 2021⁹), were reviewed as part of the assessment and are available at: Available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001625.pdf</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site. There will be no land take or possibility of encroachment into the SAC as part of the construction, operational or decommissioning phases of the proposed development; therefore no pathways for direct effects on the QI habitats of the SAC exist.</p>

⁹ NPWS (2021) Conservation Objectives: Castlesampson Esker SAC 001625. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
			<p>The detailed hydrological assessment completed as part of the EIA process, as summarised in section 2.2.2.3.2 above, has concluded that there is no hydrological connectivity between this SAC and the site of the Proposed Project, due to the presence of a catchment divide which acts as hydraulic boundary. Consequently, no potential pathway for significant effect on the SAC exists.</p> <p>No other potential pathway for significant effect on this SAC exists.</p> <p>The SAC is <i>outside</i> the Likely Zone of Impact and no further assessment is required.</p>
<p>Four Roads Turlough SAC [001637]</p> <p>Distance: 2.57km, north / 5.43km, north-west</p>	<p>➤ [3180] Turloughs*</p>	<p>Detailed conservation objectives for this site (Version 1, February 2018¹⁰), were reviewed as part of the assessment and are available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001637.pdf</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site. There will be no land take or possibility of encroachment into the SAC as part of the construction, operational or decommissioning phases of the proposed development; therefore no pathways for direct effects on the QI habitats of the SAC exist.</p> <p>The Proposed Development is within the same hydrological sub-catchment as the SAC. Given the potential for groundwater connectivity between the Proposed Development and the SAC, as identified in Section 2.2.2.3.2 above, a potential pathway for indirect hydrological/pollution impact on the SAC exists during the construction, operation, and decommissioning phases of the</p>

¹⁰ NPWS (2018) Conservation Objectives: Four Roads Turlough SAC 001637. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
			<p>development. The potential for impact via the identified pathway cannot be excluded in the absence of mitigation.</p> <p>No other potential pathway for significant effect on this SAC exists.</p> <p>Consequently, the SAC is <i>within</i> the Likely Zone of Impact and further assessment is required</p>
<p>Lough Funshinagh SAC [000611]</p> <p>Distance: 4.91km, north-east / 4.7km, north</p>	<ul style="list-style-type: none"> > [3180] Turloughs* > [3270] Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidention</i> p.p. vegetation 	<p>Detailed conservation objectives for this site (Version 1, February 2018¹¹), were reviewed as part of the assessment and are available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000611.pdf</p>	<p>This SAC is located over 4km to the north-east of the site of the proposed development. There will be no land take or possibility of encroachment into the SAC as part of the construction, operational or decommissioning phases of the proposed development; therefore no pathways for direct effects on the QI habitats of the SAC exist.</p> <p>The detailed hydrological assessment completed as part of the EIA process, as summarised in Section 2.2.2.3.2 above, has concluded that there is no hydrological connectivity between this SAC and the site of the Proposed Project, due to the presence of a catchment divide which acts as hydraulic boundary. Consequently, no potential pathway for significant effect on the SAC exists.</p> <p>The SAC is <i>outside</i> the Likely Zone of Impact and no further assessment is required.</p>

¹¹ NPWS (2018) Conservation Objectives: Lough Funshinagh SAC 000611. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022)	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
<p>Lisduff Turlough SAC [000609]</p> <p>Distance: 6.54km, north / 9.41km, north-west</p>	<ul style="list-style-type: none"> ➤ [3180] Turloughs* 	<p>Detailed conservation objectives for this site (Version 1 January 2018¹²), were reviewed as part of the assessment and are available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000609.pdf</p>	<p>This SAC is located over 6km to the north- of the site of the proposed works, therefore there is no potential for direct effects due to the nature of the qualifying interest and the separation distance.</p> <p>The Proposed Development site is within the same sub-catchment as the SAC. However, the detailed hydrological assessment completed for the proposed development, as summarised in Section 2.2.2.3.2 above and included as Appendix 3 to the accompanying NIS, has concluded that there is no hydrological connectivity between this SAC and the site of the Proposed Development, due to an area of high ground acting as a hydraulic boundary. Consequently, no potential pathway for significant effect on the SAC exists.</p> <p>The SAC is <i>outside</i> the Likely Zone of Impact and no further assessment is required.</p>
<p>Lough Ree SAC [000440]</p> <p>Distance: 8.5km east / 1.41km north-east</p>	<p>Habitats:</p> <ul style="list-style-type: none"> ➤ [3150] Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation ➤ [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) 	<p>Detailed conservation objectives for this site (Version 1 August 2016¹³), were reviewed as part of the assessment and are available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000440.pdf</p>	<p>This SAC is located over 8km to the north-west of the site of the proposed works, therefore there is no potential for direct effect due to the separation distance.</p> <p>The Proposed Development is located within a separate sub-catchment to the SAC and no potential hydrological connectivity exists between the proposed development site and the SAC, as all water flow is to the south (see summary of the detailed hydrological assessment completed for the proposed development, as</p>

¹² NPWS (2018) Conservation Objectives: Lisduff Turlough SAC 000609. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

¹³ NPWS (2016) Conservation Objectives: Lough Ree SAC 000440. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
	<ul style="list-style-type: none"> > [7120] Degraded raised bogs still capable of natural regeneration > [7230] Alkaline fens > [8240] Limestone pavements* > [91A0] Old sessile oak woods <i>Ilex</i> and <i>Blechnum</i> in the British Isles > [91D0] Bog woodland > [91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) Species: > [1355] Otter <i>Lutra</i> > 		<p>summarised in Section 2.2.2.3.2 above and included as Appendix 3 to the accompanying NIS). Consequently, due to the lack of connectivity, there are no pathways of indirect effects on the QI habitats or supporting habitat for QI species of this SAC.</p> <p>No potential for significant direct or indirect effects on the Otter population associated with the SAC exists due to the nature of the works and the intervening buffer distance.</p> <p>The SAC is <i>outside</i> the Likely Zone of Impact and no further assessment is required.</p>
<p>Aughrim (Aghrane) Bog SAC</p> <p>[002200]</p> <p>Distance: 9.67km north-west / 12.7km north-west</p>	<ul style="list-style-type: none"> > [7120] Degraded raised bogs still capable of natural regeneration 	<p>This SAC has the generic conservation objective (NPWS, 26/01/22¹⁴):</p> <p><i>“To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected”</i></p> <p>Available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002200.pdf</p>	<p>Due to the terrestrial nature of the QI habitat and the intervening distance between the SAC and the Proposed Development site, there is no potential pathway for significant direct or indirect effects to this SAC.</p> <p>The SAC is <i>outside</i> the Likely Zone of Impact and no further assessment is required.</p>

¹⁴ NPWS (2022) Conservation objectives for Aughrim (Aghrane) Bog SAC [002200]. Generic Version 9.0. Department of Housing, Local Government and Heritage.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
<p>Ballygar (Aghrane) Bog SAC [002199]</p> <p>Distance: 9.85km north-west / 12.83km north-west</p>	<ul style="list-style-type: none"> > [7110] Active raised bogs* > [7120] Degraded raised bogs still capable of natural regeneration 	<p>This SAC has the generic conservation objective (NPWS, 26/01/22¹⁵:</p> <p><i>“To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected”</i></p> <p>Available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002199.pdf</p>	<p>Due to the terrestrial nature of the QI habitat and the intervening distance between the SAC and the proposed development site, there is no potential pathway for significant direct or indirect effects to this SAC.</p> <p>The SAC is <i>outside</i> the Likely Zone of Impact and no further assessment is required.</p>

¹⁵ NPWS (2022) Conservation objectives for Ballygar (Aghrane) Bog SAC [002199]. Generic Version 9.0. Department of Housing, Local Government and Heritage.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
<p>Ballinturly Turlough SAC [000588]</p> <p>Distance: 10.5km north-west / 13.38km north-west</p>	<p>➤ [3180] Turloughs*</p>	<p>Detailed conservation objectives for this site (Version 1, January 2018¹⁶), were reviewed as part of the assessment and are available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000588.pdf</p>	<p>This SAC is located over 10km to the north of the site of the proposed works and in a different hydrological sub-catchment. Therefore, no potential hydrological connectivity exists between the proposed development site and the SAC. Consequently, no potential pathway for significant direct or indirect impacts on this SAC exists.</p> <p>The SAC is <i>outside</i> the Likely Zone of Impact and no further assessment is required.</p>

¹⁶ NPWS (2018) Conservation Objectives: Ballinturly Turlough SAC 000588. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
<p>River Shannon Callows SAC [000216]</p> <p>Distance: 11.66km east (nearest section) / 1.32km south-east (NB. Grid connection route crosses the Cross River)</p>	<p>Habitats</p> <ul style="list-style-type: none"> > [6410] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) > [6510] Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) > [7230] Alkaline fens > [8240] Limestone pavements* > [91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)* <p>Species</p> <ul style="list-style-type: none"> > [1355] Otter (<i>Lutra lutra</i>) <p>#</p>	<p>Detailed conservation objectives for this site (Version 1, January 2022¹⁷), were reviewed as part of the assessment and are available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000216.pdf</p>	<p>The proposed Grid Connection route crosses the Cross River, which in turn flows into the SAC. Therefore, a potential pathway for indirect pollution related impact requires further consideration and cannot be ruled out in the absence of mitigation.</p> <p>Taking a precautionary approach, a potential pathway for disturbance/displacement effects to Qualifying Interest species also requires further consideration.</p> <p>The SAC is considered to be <i>within</i> the Likely Zone of Impact and further assessment is required.</p>

¹⁷ NPWS (2022) Conservation Objectives: River Shannon Callows SAC 000216. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
Special Protection Area (SPA) ¹⁸			
Lough Croan Turlough SPA [004139] Distance: 1.03km north / 2.82km north	<ul style="list-style-type: none"> ➤ [A056] Northern Shoveler <i>Anas clypeata</i> (w/b) ➤ [A140] European Golden Plover <i>Pluvialis apricaria</i> (w) ➤ [A395] Greenland White-fronted Goose <i>Anser albifrons flavirostris</i> (w) ➤ [A999] Wetland and Waterbirds 	<p>This SPA has the generic conservation objectives (NPWS, 26/01/22)¹⁹:</p> <p><i>“To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA”</i></p> <p>And</p> <p><i>“To maintain or restore the favourable conservation condition of the wetland habitat at Lough Croan Turlough SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.”</i></p> <p>Available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004139.pdf</p>	<p>There will be no direct effects to SCI species from habitat loss or damage as the Proposed Development is located entirely outside the designated site. There will be no land take or possibility of encroachment into the SPA as part of the construction, operational or decommissioning phases of the proposed development; therefore no pathways for direct effects on the QI habitats of the SAC exist (see Sections 2.3.6.2).</p> <p>The following SCI species was not recorded during surveys and so cannot be significantly affected by disturbance/displacement or collision mortality/barrier effects:</p> <ul style="list-style-type: none"> ➤ [A056] Northern Shoveler <p>The following SCI species were recorded during surveys:</p> <ul style="list-style-type: none"> ➤ [A140] European Golden Plover ➤ [A395] Greenland White-fronted Goose <p>The core foraging distances for wintering European golden plover and Greenland white-fronted goose are up to 12 km (Gillings <i>et al.</i>, 2007) and 8 km (SNH, 2016), respectively. As these distances</p>

¹⁸ SCI bird species are labelled according to whether they are wintering (w), breeding (b) or wintering and breeding (w/b) species for each SPA as shown in the Natura 2000 Data Form.

¹⁹ NPWS (2022) Conservation objectives for Lough Croan Turlough SPA [004139]. Generic Version 9.0. Department of Housing, Local Government and Heritage.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022)	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
			<p>are both greater than the distance between the Proposed Development and the SPA, there is therefore potential ecological connectivity between the two.</p> <p>Taking a precautionary approach, which assumes that the birds recorded during the surveys could represent SPA birds, the potential for disturbance/displacement to these two SCI species during the construction, operational and decommissioning phases, as well as barrier effects and collision mortality during the operational phase, cannot be ruled out at this stage and requires further consideration.</p> <p>The detailed hydrological assessment completed as part of the EIA process, as summarised in Section 2.2.2.3.2 above, has concluded that there is no hydrological connectivity between this SPA and the site of the Proposed Development, due to the presence of a catchment divide which acts as hydraulic boundary. Consequently, no potential pathway for significant effect on the wetland supporting habitat of the SPA exists.</p> <p>The SPA is considered to be <i>within</i> the Likely Zone of Impact and further assessment is required.</p>
River Suck Callows SPA	<ul style="list-style-type: none"> ➤ [A038] Whooper Swan <i>Cygnus</i> (w) ➤ [A050] Eurasian Wigeon <i>Mareca penelope</i> (w) 	This site has the generic conservation objectives (NPWS, 26/01/22 ²⁰):	There will be no direct effects to SCI species from habitat loss or damage as the Proposed Development is located entirely outside the designated site. There will be no land take or possibility of

²⁰ NPWS (2022) Conservation objectives for River Suck Callows SPA [004097]. Generic Version 9.0. Department of Housing, Local Government and Heritage.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
<p>[004097]</p> <p>Distance: 2.17km west / 2.88km west</p>	<ul style="list-style-type: none"> ➤ [A140] European Golden Plover <i>Pluvialis apricaria</i> (w) ➤ [A142] Northern Lapwing <i>Vanellus</i> (w) ➤ [A395] Greenland White-fronted Goose <i>Anser albifrons flavirostris</i> (w) ➤ [A999] Wetland and Waterbirds 	<p><i>“To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA”</i></p> <p>And:</p> <p><i>To maintain or restore the favourable conservation condition of the wetland habitat at River Suck Callows SPA as a resource for the regularly-occurring migratory waterbirds that utilise it”</i></p> <p>Available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004097.pdf</p>	<p>encroachment into the SPA as part of the construction, operational or decommissioning phases of the proposed development; therefore no pathways for direct effects on the QI habitats of the SAC exist (see Sections 2.3.6.2).</p> <p>The following SCI species were recorded during surveys:</p> <ul style="list-style-type: none"> ➤ [A038] Whooper Swan ➤ [A050] Eurasian Wigeon ➤ [A140] European Golden Plover ➤ [A142] Northern Lapwing ➤ [A395] Greenland White-fronted Goose <p>The core foraging distances for wintering whooper swan, Eurasian wigeon, European golden plover, northern lapwing and Greenland white-fronted goose are up to 5 km (SNH, 2016), 20 km²¹ (SNH, 2016), 12 km (Gillings <i>et al.</i>, 2007), 12 km (Gillings <i>et al.</i>, 2007) and 8 km (SNH, 2016), respectively. As these distances are greater than the distance between the Proposed Development and the SPA, there is therefore potential ecological connectivity between the two.</p> <p>Taking a precautionary approach, which assumes that the birds recorded during the surveys could represent SPA birds, the potential for disturbance/displacement to these five SCI species during the construction, operational and decommissioning phases,</p>

²¹ Note that where no core foraging distances are available, a maximum distance of 20 km has been assumed as a precaution as explained earlier in Section 3.1. This applies here to wintering Eurasian wigeon.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022)	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
			<p>as well as collision mortality and barrier effects during the operational phase, cannot be ruled out at this stage and requires further consideration.</p> <p>The Proposed Development site is within the same sub-catchment to the SPA and potential hydrological connectivity has been identified between the proposed development site and the supporting wetland habitat of the SPA given that the proposed grid connection route crosses the Ballyglass River, which in turn flows to the SPA. Potential for indirect effects therefore exists in the form of a deterioration in water quality, reduction in volume or change in flow path on [A999] Wetland and Waterbirds.</p> <p>The SPA is considered to be <i>within</i> the Likely Zone of Impact and further assessment is required.</p>
<p>Four Roads Turlough SPA [004140]</p> <p>Distance: 2.57km north / 5.43 km north-west</p>	<ul style="list-style-type: none"> ➤ [A140] European Golden Plover <i>Pluvialis apricaria</i> (w) ➤ [A395] Greenland White-fronted Goose <i>Anser albifrons flavirostris</i> (w) ➤ [A999] Wetland and Waterbirds 	<p>This site has the generic conservation objectives (NPWS, 26/01/22²²):</p> <p><i>“To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA”</i></p> <p>And:</p>	<p>There will be no direct effects to SCI species from habitat loss or damage as the Proposed Development is located entirely outside the designated site (see Sections 2.3.6.2)</p> <p>The following SCI species were recorded during surveys:</p> <ul style="list-style-type: none"> ➤ [A140] European Golden Plover ➤ [A395] Greenland White-fronted Goose

²² NPWS (2022) Conservation objectives for Four Roads Turlough SPA [004140]. Generic Version 9.0. Department of Housing, Local Government and Heritage

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
		<p><i>“To maintain or restore the favourable conservation condition of the wetland habitat at Four Roads Turlough SPA as a resource for the regularly occurring migratory waterbirds that utilise it.”</i></p> <p>Available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004140.pdf</p>	<p>The core foraging distances for wintering European golden plover and Greenland white-fronted goose are up to 12 km (Gillings <i>et al.</i>, 2007) and 8 km (SNH, 2016) respectively. As these distances are both greater than the distance between the Proposed Development and the SPA, there is therefore potential ecological connectivity between the two.</p> <p>Taking a precautionary approach, which assumes that the birds recorded during the surveys could represent SPA birds, the potential for disturbance/displacement to these two SCI species during the construction, operational and decommissioning phases, as well as collision mortality and barrier effects during the operational phase, cannot be ruled out at this stage and requires further consideration.</p> <p>The Proposed Development is within the same hydrological sub-catchment as the SPA. Given the potential for groundwater connectivity between the Proposed Development and the SPA, as identified in Section 2.2.2.3.2 above, a potential pathway for indirect hydrological/pollution impact on the SAC exists during the construction, operation, and decommissioning phases of the development. The potential for impact on supporting Wetlands and Waterbirds [A999] habitat via the identified pathway cannot be excluded in the absence of mitigation.</p> <p>The SPA is considered to be <i>within</i> the Likely Zone of Impact and further assessment is required.</p>

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022)	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
<p>Lough Ree SPA [004064]</p> <p>Distance: 8.49km east / 1.36km north</p>	<ul style="list-style-type: none"> ➤ [A004] Little Grebe <i>Tachybaptus ruficollis</i> (w) ➤ [A038] Whooper Swan <i>Cygnus</i> (w) ➤ [A050] Eurasian Wigeon <i>Mareca penelope</i> (w) ➤ [A052] Eurasian Teal <i>Anas crecca</i> (w) ➤ [A053] Mallard <i>Anas platyrhynchos</i> (w)ⁱ ➤ [A056] Northern Shoveler <i>Anas clypeata</i> (w) ➤ [A061] Tufted Duck <i>Aythya fuligula</i> (b) ➤ [A065] Common Scoter <i>Melanitta nigra</i> (b) ➤ [A067] Goldeneye <i>Bucephala clangula</i> (w) ➤ [A125] Eurasian Coot <i>Fulica atra</i> (w) ➤ [A140] European Golden Plover <i>Pluvialis apricaria</i> (w) ➤ [A142] Northern Lapwing <i>Vanellus</i> (w) ➤ [A193] Common Tern <i>Sterna hirundo</i> (b) 	<p>This site has the generic conservation objectives (NPWS, 26/01/22²³):</p> <p><i>“To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA”</i></p> <p>And:</p> <p><i>“To maintain or restore the favourable conservation condition of the wetland habitat at Lough Ree SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.”</i></p> <p>Available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004064.pdf</p>	<p>There will be no direct effects to SCI species from habitat loss or damage as the Proposed Development is located entirely outside the designated site (see Section 2.3.6.2).</p> <p>The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement, barrier effects or collision mortality:</p> <ul style="list-style-type: none"> ➤ [A004] Little Grebe ➤ [A056] Northern Shoveler ➤ [A061] Tufted Duck ➤ [A067] Goldeneye ➤ [A193] Common Tern <p>The following SCI species were recorded during surveys:</p> <ul style="list-style-type: none"> ➤ [A038] Whooper Swan ➤ [A050] Eurasian Wigeon ➤ [A052] Eurasian Teal ➤ [A053] Mallard ➤ [A065] Common Scoter ➤ [A125] Eurasian Coot ➤ [A140] European Golden Plover ➤ [A142] Northern Lapwing

²³ NPWS (2022) Conservation objectives for Lough Ree SPA [004064]. Generic Version 9.0. Department of Housing, Local Government and Heritage.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
	<p>➤ [A999] Wetland and Waterbirds</p>		<p>The core foraging distances²⁴ for wintering whooper swan, Eurasian wigeon, Eurasian teal, mallard, Eurasian coot, European golden plover and Northern lapwing are up to 5 km (SNH, 2016), 20 km (SNH, 2016), 20 km (SNH, 2016), 20 km (SNH, 2016), 20 km (SNH, 2016), 12 km (Gillings <i>et al.</i>, 2007) and 12 km (Gillings <i>et al.</i>, 2007), respectively. The core foraging distance for breeding common scoter is 20 km (SNH, 2016).</p> <p>As these distances are greater than the distance between the Proposed Development and the SPA (for all but whooper swan), there is therefore potential ecological connectivity between the two for all species except whooper swan. As the Proposed Development is beyond the core foraging range for whooper swan, any whooper swans forming part of the Lough Ree population cannot be significantly affected by disturbance/displacement or collision mortality/barrier effects.</p> <p>Taking a precautionary approach, which assumes that the birds recorded during the surveys could represent SPA birds, the potential for disturbance/displacement to the other seven SCI species listed above during the construction, operational and decommissioning phases, as well as collision mortality and barrier effects during the operational phase, cannot be ruled out at this stage and requires further consideration.</p>

²⁴ Note that where no core foraging distances are available, a maximum distance of 20 km has been assumed as a precaution as explained earlier in Section 3.1. This applies here to Eurasian wigeon, Eurasian teal, mallard, Eurasian coot and common scoter.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022)	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
			<p>The Proposed Development is located within a separate hydrological sub-catchment to the SPA; no potential hydrological connectivity exists between the Proposed Development site and the SPA, as all water flow is to the south (see Section 2.2.2.3.2 above). Therefore, no potential exists for significant effect on supporting Wetlands and Waterbirds [A999] habitat.</p> <p>The SPA is considered to be <i>within</i> the Likely Zone of Impact and further assessment is required.</p>
<p>Middle Shannon Callows SPA [004096]</p> <p>Distance: 11.66km south-east/ 1.31km east</p>	<ul style="list-style-type: none"> ➤ [A038] Whooper Swan <i>Cygnus</i> (w) ➤ [A050] Eurasian Wigeon <i>Maracas penelope</i> (w) ➤ [A122] Corncrake <i>Crex</i> (b) ➤ [A140] European Golden Plover <i>Pluvialis apricaria</i> (w) ➤ [A142] Northern Lapwing <i>Vanellus</i> (w/b) ➤ [A156] Black-tailed godwit <i>Limosa</i> (w/b) ➤ [A179] Black-headed Gull <i>Chroicocephalus ridibundus</i> (w) ⁱ ➤ [A999] Wetland and Waterbirds 	<p>This site has the generic conservation objectives (NPWS, 26/01/22²⁵):</p> <p><i>“To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA”</i></p> <p>And:</p> <p><i>“To maintain or restore the favourable conservation condition of the wetland habitat at Middle Shannon Callows SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.”</i></p>	<p>There will be no direct effects to SCI species from habitat loss or damage as the Proposed Development is located entirely outside the designated site (see Sections 2.3.6.2).</p> <p>The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement, barrier effects or collision mortality:</p> <ul style="list-style-type: none"> ➤ [A122] Corncrake ➤ [A156] Black-tailed godwit <p>The following SCI species were recorded during surveys:</p> <ul style="list-style-type: none"> ➤ [A038] Whooper Swan ➤ [A050] Eurasian Wigeon

²⁵ NPWS (2022) Conservation objectives for Middle Shannon Callows SPA [004096]. Generic Version 9.0. Department of Housing, Local Government and Heritage.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
		<p>Available at: www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004096.pdf</p>	<ul style="list-style-type: none"> > [A140] European Golden Plover > [A142] Northern Lapwing > [A179] Black-headed Gull <p>The core foraging distances²⁶ for wintering whooper swan, Eurasian wigeon, European golden plover, Northern lapwing and black-headed gull are up to 5 km (SNH, 2016), 20 km (SNH, 2016), 12 km (Gillings <i>et al.</i>, 2007), 12 km (Gillings <i>et al.</i>, 2007) and 20 km (SNH, 2016), respectively.</p> <p>As these distances are greater than the distance between the Proposed Development and the SPA (for all species but whooper swan), there is therefore potential ecological connectivity between the two for all species except whooper swan. As the Proposed Development is beyond the core foraging range for whooper swan, any whooper swans forming part of the Middle Shannon Callows population cannot be significantly affected by disturbance/displacement or collision mortality/barrier effects.</p> <p>Taking a precautionary approach, which assumes that the birds recorded during the surveys could represent SPA birds, the potential for disturbance/displacement to the other four SCI species during the construction, operational and decommissioning phases, as well as collision mortality and barrier effects during the</p>

²⁶ Note that where no core foraging distances are available, a maximum distance of 20 km has been assumed as a precaution as explained earlier in Section 3.1. This applies here to wintering Eurasian wigeon and black-headed gull.

European Sites and distance from proposed Wind Farm site/ Grid Connection route	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 12/04/2022	Conservation Objectives	Identification of Impact Pathways and Screening Assessment
			<p>operational phase, cannot be ruled out at this stage and requires further consideration.</p> <p>The proposed Grid Connection route crosses the Cross River, which in turn has connectivity to the SPA, and therefore potential for indirect effects exists in the form of a deterioration in water quality exists in the form of a deterioration in water quality, reduction in volume or change in flow path on the supporting wetland habitat of the SPA [A999].</p> <p>The SPA is considered to be <i>within</i> the Likely Zone of Impact and further assessment is required.</p>

3.2 Likely Cumulative Impact of the Proposed Development on European Sites, in combination with other plans and projects

3.2.1.1 Development context – Ecological Plans and Policies

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

- Roscommon County Development Plan 2022 - 2028
- National Biodiversity Action Plan 2017-2021
- Northern & Western Regional Assembly Regional Spatial and Economic Strategy 2020-2032 (RSES)

The review focused on policies and objectives that relate to Natura 2000 sites and natural heritage. Policies and objectives relating to sustainable land use were also reviewed.

Table 3.2: Review of land use and spatial plans

	Key Policies/Issues/Objectives Directly Related to European Sites In The Zone of Influence	Assessment of development compliance with policy
Roscommon County Development Plan 2022 - 2028	<ul style="list-style-type: none"> ➤ Policy Objective NH. 10.4 Implement Article 6(3) and where necessary Article 6(4) of the Habitats Directive and to ensure that Appropriate Assessment is carried out in relation to works, plans and projects likely to impact on European sites (SACs and SPAs), whether directly or indirectly or in combination with any other plan(s) or project(s). All assessments must be in compliance with the European Communities (Birds and Natural Habitats) Regulations 2011. ➤ Policy Objective NH. 10.5 Ensure that no plans, programmes, etc. or projects are permitted that give rise to significant cumulative, direct, indirect or secondary impacts on European Sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, 	<p>This NIS has been prepared in respect of the proposed development to enable An Bord Pleanála to undertake an appropriate assessment under and in accordance with Part XAB of the Planning and Development Act 2000 as amended.</p> <p>There will be no adverse effects on QIs/SCI of designated sites as a result of deterioration in water quality or disturbance of QI species. The proposed development has been designed to</p>

	<p>operation, decommissioning or from and other effects, (either individually or in combination with other plans, programmes, etc. or projects).</p> <p>➤ Policy Objective NH 10.6 Ensure that any plan or project that could have a significant adverse impact (either alone or in combination with other plans and projects) upon the conservation objectives of any Natura 2000 Site or would result in the deterioration of any habitat or any species reliant on that habitat will not be permitted.</p>	<p>avoid any effect on water quality outside the site as set out in Section 5 of this NIS.</p>
<p>Regional Spatial and Economic Strategy 2020-2032</p>	<p>RPO 5.4 Encourage the prioritisation of Site-Specific Conservation Objectives (SSCO) for all sites of Conservation Value, designated in EU Directive (i.e. SACs, SPAs) to integrate with the development objectives of this Strategy.</p> <p>RPO 5.5 Ensure efficient and sustainable use of all our natural resources, including inland waterways, peatlands, and forests in a manner which ensures a healthy society a clean environment and there is no net contribution to biodiversity loss arising from development supported in this strategy. Conserve and protect designated areas and natural heritage area. Conserve and protect European sites and their integrity.</p> <p>RPO 5.7 Ensure that all plans, projects and activities requiring consent arising from the RSES are subject to the relevant environmental assessment requirements including SEA, EIA and AA as appropriate.</p>	<p>There will be no adverse effects on QI's/SCT's/SSCO's as a result of deterioration in water quality or disturbance. The proposed development has been designed to avoid any effects on water quality and/or designated natura sites outside the site as set out in section 5 of this NIS.</p>
<p>National Biodiversity Action Plan 2017-2021</p>	<p>Target 6.2 - Sufficiency, coherence, connectivity, and resilience of the protected areas network substantially enhanced by 2020.</p>	<p>There will be no adverse effects on designated sites or biodiversity as a result of the proposed development. The Proposed Development will not impact on connectivity within the wider area and will maintain watercourses within and adjacent to the development site in good condition.</p>

3.2.1.2 Other Projects

Assessment material for this in-combination impact assessment was compiled on the relevant developments within the vicinity of the Proposed Development and was verified on the 30/05/2022. 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 AA reports, EISs/ElARs, layouts, drawings etc.) for all relevant projects. These are listed below.

As detailed in Table 3-3, Energia Renewables Ireland Ltd. has applied to Roscommon County Council for the erection of two guy-wired lattice meteorological mast of up to 100 metres in height within the Proposed Development site; one being located in within the townland of Skeavally, the second located within the townland of Cronin; for a period of 5 years.

Table 3-3: Met Mast applications within the proposed development site

Pl. Ref	Description	Decision
21/274	Erection of a temporary meteorological mast - the development will consist of: The erection of a guy-wired lattice meteorological mast of up to 100 metres in height; Associated works, services and foundations area, planning permission is sought for a period of 5 years	Pending – Further Information Requested
21/275	Erection of temporary meteorological mast - the development will consist of: The erection of a guy - wired lattice meteorological mast of up to 100 metres in height; Associated works, services and foundations area, planning permission is sought for a period of 5 years	Pending – Further Information Requested

3.2.1.2.1 Other Wind Farm Sites

Within the wider area, there have been a number of planning applications for wind farm developments (comprising two or more turbines) lodged within a 20-kilometre radius of the study area. These wind farms applications are based on a review of the Roscommon County Council Planning Register and include those listed in the following subsections. 20km was considered to be an appropriate distance for consideration of other wind energy developments given that likely zone of influence of this project has been identified as being 15km and the only existing wind farm also within the River Shannon catchment (the Skrine Wind Farm) is located ~8.5km from the Proposed Development site.

Table 3-4 lists the existing and permitted wind farms located in Co. Roscommon within 20-kilometre radius of the Proposed Development site. The locations of the wind farms are shown in Figure 8-1 of the accompanying NIS.

Table 3-4: Other Wind Farm Developments Within the Approximately 20km of the Proposed Development

Pl.Ref	Description	Decision
Skrine Wind Farm (Approx 8.5km to the north of the proposed development site)		
04/103	For 3 wind turbine generators, one meteorological tower, one substation and substation compound and associated site access roads.	Granted by RCC Granted by An Bord Pleanála (Ref: 208733) 20/01/2005 2 turbines constructed
10/3002	Application for extension of duration re PD/04/103, For 3 wind turbine generators, one meteorological tower, one substation and substation compound and associated site access roads	Granted by RCC 24/02/2010

Pl.Ref	Description	Decision
Derrane Wind Farm (Approx. 20km north of the proposed development site)		
11/126	Erect two number 2.3MW wind turbines, of up to 85 metre hub height and up to 82 metre rotor diameter with a total height not exceeding 126 metres, associated site works to include new internal site tracks, upgrading existing site tracks, turbine hardstands, control sub station, and cabling works	Granted by RCC 03/01/2012
18/313	Minor technical amendments to the development permitted under Reference 11/126 to provide for the relocation and redesign of the permitted control substation; the construction and re-alignment of internal site access tracks; redesign of permitted hardstand areas; re-alignment of cabling works; minor upgrade works to permitted site entrance; and all associated site development and reinstatement works	Granted by RCC 28/09/2018
18/447	Minor amendments to the development permitted under Roscommon County Council Planning Register References 11/126 and 18/313 to provide for the relocation of the permitted wind turbines and associated infrastructure (site roads and crane hard-standings); amendments to the turbine dimensions to allow for a maximum overall tip height of up to 150 metres and all associated site development and reinstatement works.	Refused by RCC Granted by An Bord Pleanála (303677) 12/07/2019
20/145	For development consisting of minor amendments to the development permitted under Roscommon County Council Planning Register Reference 18/313 to provide for (i) the relocation of the permitted control substation approximately 810 metres to the north, (ii) omission of access track and underground electrical cabling associated with the permitted control substation, (iii) installation of approximately 530 metres of underground electrical cabling to connect the proposed control substation to permitted wind turbine T1 and (iv) all associated site development access and reinstatement works at	Granted by RCC Granted by An Bord Pleanála (307726) 12/11/2020 Not yet constructed
21/3007	Extension of duration for 11/126.	Granted by RCC 12/04/2021
Kilcash Wind Farm (Approx. 10.3km north of the proposed development site)		
21/221	Construction of one 4.2 MW wind turbine with overall tip height of up to 150m including on-site 20kV substation and underground electrical cable; All associated site development and ancillary works.	Refused by RCC 20/01/2021; Appealed to An Bord Pleanála (ref: 312748-22), Pending

3.2.1.2.2 Non Renewable Energy Developments

Table 3-5 below lists non-renewable energy development existing and approved projects as well as planning applications pending a decision within approximately 2km of the proposed locations of turbines within the Proposed Development site from the last 6 years (beyond this period built developments were considered to form part of the baseline). Here a 2km distance from wind farm development has been considered for operational and construction purposes as an appropriate buffer to identify potential sensitive receptors and cumulative projects in the non-renewable energy category that should be considered in the context of the Proposed Development. This distance was also considered to be proportional to the likely zone of influence of the developments listed below, which are relatively small-scale.

Table 3-5: Other Developments in the Vicinity of the Proposed Development

Pl. Ref	Description	Decision
16/41	Development of a new dwelling house with proprietary effluent treatment system and soil polishing filter, new road entrance and all ancillary site works	Granted by RCC 03/05/2016
16/43	To erect dwelling house and to construct septic tank and percolation area	Granted by RCC 03/05/2016
16/104	To construct a four bay slatted cattle shed and a four bay calving shed on his lands	Granted by RCC 01/06/2016
16/251	To construct dwellinghouse, domestic garage and install waste water treatment unit with polishing filter	Granted by RCC 02/09/2016
16/476	For erection of dwelling house and domestic garage with sewerage treatment plant and percolation area and associated site development works	Granted by RCC 12/05/2017
17/63	To carry out alterations/extend dwelling house	Granted by RCC 08/05/2017
17/106	For a new dwelling, domestic garage, proprietary effluent treatment system and soil polishing filter, new road entrance, and all associated ancillary site development works	Granted by RCC 04/09/2017
17/136	To construct a dwelling house and install a waste water treatment unit with polishing filter	Granted by RCC 27/06/2017
17/211	To construct a dwelling house, domestic garage and septic tank with percolation area and all associated site works	Granted by RCC 19/09/2017
17/294	Development consisting of extension to rear and to side of existing dwelling house and carrying out all ancillary site works	Refused by RCC 11/08/2017
17/397	To construct a private dwelling house, a domestic garage and sewerage treatment system with all other site services	Granted by RCC 11/04/2018
18/166	Planning permission to erect extension/carry out alterations to dwelling house and to construct ancillary site works	Granted by RCC 02/11/2018
17/397	To construct a private dwelling house, a domestic garage and sewerage treatment system with all other site services	Granted by RCC 11/04/2018
17/420	The development will consist of a new dwelling house, garage, entrance, proprietary effluent treatment system and soil polishing filter, connection to services and all ancillary site works	Granted by RCC 01/10/2018
18/329	To construct a dwelling house, domestic garage and single dwelling treatment system with percolation area and associated site works	Granted by RCC 12/11/2018
18/407	To construct a slatted shed to include concrete apron and all associated works	Granted by RCC 05/11/2018
18/496	Deletion of Condition No. 17 of previously granted planning permission reference PD/02/578	Granted by RCC 03/12/2018

18/631	To erect a domestic garage/fuel shed and to construct ancillary site works	Granted by RCC 19/03/2019
19/4	Retention to erect extensions to the side and rear of dwelling house and to retain domestic garage/fuel shed	Granted by RCC 09/04/2019
19/43	Development consisting of the following:- (1) Slatted shed; (2) Silage base; (3) Sheep shed; (4) Retain existing loose shed together with all associated site works	Granted by RCC 08/05/2019
19/71	For development consisting of a 2 storey dwelling, sewage treatment plant, percolation area, new site entrance, new garage with associated site works	Granted by RCC 15/05/2019
19/77	For erection of dwelling house and domestic garage with sewerage treatment plant and percolation area, and ancillary site development works	Granted by RCC 04/06/2019
19/85	To demolish derelict dwelling and outbuildings and construct new part single storey/part two storey dwelling, detached domestic garage, use and upgrade existing entrance, effluent treatment system, percolation area and associated site works	Granted by RCC 15/05/2019
19/451	For development consisting of a bungalow dwelling, septic tank, percolation area and new entrance	Granted by RCC 10/12/2019
19/632	Permission to construct a five bay double slatted sheep shed on lands	Granted by RCC 12/03/2020
20/1	Permission for proposed agricultural shed, a new site entrance, retention of garage, retention of relocation of septic tank percolation area as per Planning Permission previously granted under Ref. No. PD/04/81 and all associated works.	Granted by RCC 22/12/2020
20/117	To construct dwelling house, domestic garage and install waste water treatment unit with polishing filter	Granted by RCC 14/08/2020
20/139	Retention for domestic garage and fuel storage shed constructed on site and all associated site works	Granted by RCC 14/08/2020
20/276	To construct dwelling house, domestic garage, treatment system and all ancillary site development works	Granted by RCC 26/01/2021
20/323	To construct a four bay single loose cattle shed and dungstead on lands.	Granted by RCC 27/10/2020
20/364	For development which will consist of a new dwelling, garage, gated entrance, wastewater treatment system and polishing filter and all ancillary site works	Granted by RCC 11/02/2021
20/398	For the construction of a single storey dwelling house and a domestic garage together with the installation of a waste water treatment system / percolation area and all necessary site services / ancillary siteworks.	Granted by RCC 17/06/2021
20/412	For the construction of a dwelling house, domestic garage, the installation of a sewerage treatment unit and percolation area along with connections to all site services and all other associated site works	Granted by RCC 04/03/2021

20/415	To construct a dwelling house, garage, waste water treatment system & associated siteworks	Granted by RCC 15/01/2021
20/486	For demolition of old dwelling house on site, and for erection of new dwelling house and domestic garage, with septic tank and percolation area and ancillary site development works	Granted by RCC 04/03/2021
20/516	To erect a dwelling house, a domestic garage, install a secondary waste treatment unit with soil polishing filter and to construct all ancillary site works to facilitate same.	Granted by RCC 18/03/2021
21/42	To construct 5 bay machinery / storage shed together with associated siteworks	Granted by RCC 29/04/2021
21/103	To construct a new residential dwelling and shed	Granted by RCC 11/07/2021
21/237	Permission to construct a dwelling house, garage, waste water treatment system & associated siteworks	Granted by RCC 05/07/2021

Finally, a review of all projects (existing and permitted) within 500 meters of the Grid Connection route have been reviewed from the last 6 years (beyond this period built developments were considered to form part of the baseline). The 500-meter distance from the Grid Connection route reflects a generous and conservative range in terms of identifying permissions which may have the potential for cumulative effects having regard to the nature of the Grid Connection works (i.e. construction and operation of underground cabling). Many of the noted applications relate to agricultural developments and/or single residential developments. Table 3-6 below lists those existing and approved projects as well as planning applications pending a decision identified within 500m of the Grid Connection works.

Table 3-6: Other Developments Within 500 Meters of the Grid Connection Route

Pl. Ref:	Description	Decision
16/19	Change of use of a takeaway and additional floor space	Granted by RCC 16/03/2016
16/297	Construct an admin building as per Pl Ref 04/1176	Granted by RCC 11/11/2016
16/415	Construct 6 no. houses	Granted by RCC 24/04/2017
17/269	Change of use to the rear of a dwelling	Granted by RCC 31/01/2018
17/420	Construct a dwelling house	Granted by RCC 23/08/2018
17/465	Construct 27 no. dwelling houses	Granted by RCC 29/05/2018
18/197	Change of use of a bookmakers and amendments to Pl Ref 07/1440	Granted by RCC 31/05/2018
18/280	Extension to dwelling house	Granted by RCC 13/07/2018
18/399	Construct a dwelling house	Granted by RCC 19/10/2018
19/63	Construct extension to dwelling house	Granted by RCC 28/03/2019
19/82	Development of a new ground floor lobby	Granted by RCC 05/06/2019
19/283	Change of use of a premises to early learning centre from commercial	Granted by RCC 18/07/2019

19/592	Construct a domestic dwelling	Granted by RCC 17/01/2020
20/421	Retail extension	Granted by RCC 19/01/2021
20/519	Raise the height of side boundary	Granted by RCC 08/02/2021
20/556	Amendments to PI Ref 17/465	Granted by RCC 17/05/2021
21/103	Construct a dwelling house	Granted by RCC 09/07/2021
21/113	Construction of a retail store	Granted by RCC 23/04/2021
21/377	Extension to dwelling house	Granted by RCC 27/08/2021
21/507	Sub division of a retail unit with an additional shop opening	Decision due 02/11/2021

The majority of non-renewable energy related planning applications in the immediate vicinity of the proposed Grid Connection route are related to the provision and/or alteration of one-off housing, retail, amenity and agricultural developments.

3.2.2

Conclusion of In-combination Screening Assessment

Following the detailed assessment provided in the preceding sections, the potential for likely significant effects on the following European Sites cannot be excluded in the absence of mitigation:

- > Ballynamona Bog And Corkip Lough SAC
- > Killeglan Grassland SAC
- > Four Roads Turlough SAC
- > River Shannon Callows SAC
- > Lough Croan Turlough SPA
- > River Suck Callows SPA
- > Four Roads Turlough SPA
- > Lough Ree SPA
- > Middle Shannon Callows SPA

Further assessment in relation to the above listed sites shall be provided in a voluntary Natura Impact Statement for the Proposed Development.

All plans and projects identified in Section 3.2.1.1 and 3.2.1.2 have been brought forward for further consideration to Stage 2 of the Appropriate Assessment process and are considered further within the NIS.

4. APPROPRIATE ASSESSMENT SCREENING STATEMENT AND CONCLUSIONS

4.1 Concluding Statement

Following an examination, analysis and evaluation of the relevant data and information set out within this AA Screening Report, it cannot be excluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the Proposed Development, individually or in combination with other plans and projects, would be likely to have a significant effect on the following sites:

- Ballynamona Bog And Corkip Lough SAC
- Killeglan Grassland SAC
- Four Roads Turlough SAC
- River Shannon Callows SAC
- Lough Croan Turlough SPA
- River Suck Callows SPA
- Four Roads SPA
- Lough Ree SPA
- Middle Shannon Callows SPA

As a result, an Appropriate Assessment is required, and a Natura Impact Statement has been prepared in respect of the Proposed Development in order to assess whether the Proposed Development will adversely impact the integrity of these European Sites, alone, or in combination with other plans and projects.

No pathways for significant effect on any other European Site were identified. Thus, it can be excluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the Proposed Development, individually or in combination with other plans and projects, would be likely to have a significant effect on any other European Sites than those listed above.

5.

BIBLIOGRAPHY

Bailey, M. and Rochford J. (2006) Otter Survey of Ireland 2004/2005. Irish Wildlife Manuals, No. 23. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Balmer, D.E., Gillings, S., Caffrey, B.J., Swann, R.L., Downie, I.S. and Fuller, R.J. (2013). Bird Atlas 2007-11: the breeding and wintering birds of Britain and Ireland. BTO Books, Thetford, UK.

Barbour, M.T. and J.B. Stribling. (1991) Use of Habitat Assessment in Evaluating the Biological Integrity of Stream Communities. Biological Criteria: Research and Regulation: 25-38. EPA-440/5-91-005. Washington, DC: Office of Water, US EPA.

Birds Directive (2009/47/EC) – http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

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

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive).

DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. DEHLG, Dublin.

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

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

EC (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC.

EC (2002) Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission.

EC (2006) Nature and biodiversity cases: Ruling of the European Court of Justice. Office for Official Publications of the European Communities, Luxembourg.

EC (2007a) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. Office for Official Publications of the European Communities, Luxembourg. European Commission.

EC (2007b) Interpretation Manual of European Union Habitats. Version EUR 27. European Commission, DG Environment.

European Communities (Conservation of Wild Birds) Regulations, 1985, SI 291/1985 & amendments – <http://www.irishstatutebook.ie>

Fossitt, J. A. (2000). A Guide to Habitats in Ireland. Dublin: The Heritage Council.

- Gillings, S., Fuller, R.J. and Sutherland, W.J. (2007). Winter field use and habitat selection by Eurasian Golden Plovers *Pluvialis apricaria* and Northern Lapwings *Vanellus vanellus* on arable farmland. *Ibis*. 149: 509-520.
- Murphy, D.F. (2004) Requirements for the Protection of Fisheries Habitat During Construction and Development Works at River Sites. Eastern Regional Fisheries Board, Dublin.
- Natural England (March 2007). Draft Guidance: The Assessment of Regional Spatial Strategies and Sub-Regional Strategies Under the Provisions of the Habitats Regulations.
- NPWS (2008) The Status of EU Protected Habitats and Species in Ireland. Conservation Status in Ireland of Habitats and Species listed in the European Council Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC.
- NPWS of the DEHLG (2008) The Report on Status of Habitats and Species in Ireland: Technical Reports and Forms.
- NPWS Protected Site Synopses and maps available on <http://www.npws.ie/en/ProtectedSites/>
- NRA (2004) Environmental Impact Assessment of National Road Schemes – A Practical Guide, National Roads Authority, Dublin.
- NRA (2004) Guidelines for the Treatment of Noise and Vibration in National Road Schemes (1 ed.). Dublin: National Roads Authority.
- NRA (2005) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes. Dublin: National Roads Authority.
- NRA (2006) Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. Dublin: National Roads Authority.
- NRA (2009). Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. Dublin: National Roads Authority.
- NRA (2008). The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads. Dublin: National Roads Authority.
- Pendlebury, C., Zisman, S., Walls, R., Sweeney, J., McLoughlin, E., Robinson, C., Turner, L. & Loughrey, J. (2011). *Literature review to assess bird species connectivity to Special Protection Areas. Scottish Natural Heritage Commissioned Report No. 390*
- Scottish Natural Heritage (SNH) (2016) *Assessing Connectivity with Special Protection Areas (SPA). Version 3 – June 2016.*
- Scottish Natural Heritage (SNH) (2017). *Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms. Version 2.*
- Stace, C. A. (1997). *New Flora of the British Isles*. Cambridge: Cambridge University Press.
- Therivel R. (2009) Workshop Material on the Habitats Directive Assessment of Plans Levett-Therivel Sustainability Consultants on behalf of the Heritage Council, Kilkenny.
- Therivel, R. (2009) ‘Appropriate assessment of plans in England’, *Environmental Impact Assessment Review* 29(4), pp. 261-272.