



Knockanarragh Wind Farm

Section 37E SID Application

Knockanarragh Wind Farm Ltd

Prepared by:

SLR Environmental Consulting (Ireland) Ltd

7 Dundrum Business Park, Windy Arbour, Dublin, D14
N2Y7

SLR Project No.: 501.00727.00008

Client Reference No: 00727

March 2024

Environmental Impact Assessment Report Volume 1 – NTS

Copyright © 2024 Knockanarragh Wind Farm Limited

All pre-existing rights reserved.

This document is supplied on and subject to the terms and conditions of the Contractual Agreement relating to this work, under which this document has been supplied.

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
0.1 (Internal)	28 August 2023	EG	AOB	
0.2 (Internal)	14 March 2024		LH	
1.0 (Client Issue)	25 March 2024		AOB	



Table of Contents

1.0 Introduction	1
1.1 Overview	1
1.2 Location of Proposed Development	1
1.3 Proposed Development Site and Surrounds	1
1.4 The Application and EIAR Requirement	2
1.5 The Applicant	2
1.6 Land Ownership	2
1.7 EIAR Structure	2
1.8 Permission Period	3
1.9 Competent Experts	3
2.0 The Need for the Development and Alternatives	4
2.1 Alternatives to the Proposed Development	4
2.2 Consultation Feedback	4
3.0 Description of Proposed Development	5
3.1 Proposed Development	5
3.2 Elements of the Proposed Development	6
3.3 Site Drainage	7
3.4 Power Output	8
3.5 Construction Programme	8
3.6 Traffic Management	8
3.6.1 Wind Farm	8
3.6.2 Turbine Delivery Route	8
3.6.3 Traffic Management During Construction	9
3.7 Operation	9
3.8 Decommissioning	9
4.0 Population and Human Health	10
5.0 Biodiversity	11
5.1 Biodiversity Features	11
5.2 Potential Impacts	12
6.0 Land, Soils and Geology	13
6.1 Features within the Study Area	13
6.2 Assessment Work	13
7.0 Water	15
7.1.1 Water Features	15
7.2 Hydrological Arrangements for Proposed Development	15



8.0 Air and Climate	17
8.1 Dust and Traffic Emissions.....	17
8.2 Climate Change.....	18
9.0 Noise and Vibration	19
10.0 Landscape and Visual	20
10.1 Landscape Features.....	20
10.2 Potential Changes to Landscape.....	21
10.3 Potential Changes to Views.....	22
10.4 Cumulative Wind Project Proposals.....	22
11.0 Shadow Flicker	23
12.0 Cultural Heritage	24
13.0 Material Assets	25
14.0 Traffic	25
14.1 Road Capacity.....	26
15.0 Major Accidents and Disasters	27
16.0 Interactions	27
17.0 Schedule of Mitigation Measures	28



1.0 Introduction

1.1 Overview

SLR Consulting Ltd (SLR) has prepared this Environmental Impact Assessment Report (EIAR) on behalf of Knockanarragh Wind Farm Limited. The EIAR is to support Knockanarragh Wind Farm Limited in applying for planning permission to An Bord Pleanála for the construction of the Proposed Development as described in **Chapter 2** of this EIAR. The Proposed Development would be carried out in Counties Westmeath and Meath.

1.2 Location of Proposed Development

The Main Wind Farm Development Site which accommodates 8 Turbines and all associated infrastructure is located west of the N52 National Road from Delvin to Clonmellon in the townlands of Clonmellon, Kilrush Upper, Kilrush Lower, Newtown, Ballinlig, Carnybrogan, Cavestown and Rosmead in County Westmeath. The Site location is approximately 1km southwest of the village of Clonmellon and c.2.8km northeast of Delvin, in Co. Westmeath. This part of the site will be accessed directly from the L5542 and an existing agricultural entrance of the N52.

A 33kV cable is proposed to be laid under the public road (L5542 and N52) to connect the Main Wind Farm Development Site to the national grid via a proposed 110kV Substation at Clonmellon. The 110 kV Substation and 33 kV cable also forms part of the Proposed Development.

The Proposed Substation Site is located in the townland of Galboystown in County Meath, on the western outskirts of Clonmellon (c. 200m from the settlement boundary).

1.3 Proposed Development Site and Surrounds

The Proposed Development Site covers an area of 115.81 Ha and is elongated in shape (measuring approximately 4km north – south), encompassing the proposed turbines, grid route and the substation. The site consists of a mixture of agricultural land, primarily grazing, and forestry. The Proposed Development Site contains approximately 79.11 hectares of forestry and approximately 74.13 hectares of mostly pastoral agricultural land.

The western boundary of the Main Wind Farm Development Site is immediately bound by the Westmeath / Meath County administrative boundary. The site borders the River Boyne and Blackwater cSAC (Site Code: 002299) to the north, northwest, west and southwest. The River Stonyford and its tributary D'arcy Crossroad Streams forms part of the western boundary of the Main Wind Farm site.

The lowest part of the Main Wind Farm site is located close to Darcy's Crossroads Stream at the northwest boundary of the site. This part of the Proposed Development Site includes proposed locations for T1 and T2 and is located at c. 88m AOD. The highest point in the northern cluster is at 106m AOD, c. 820m southeast of turbine location T3. The southern cluster of turbines lies between at c. 90-91m AOD for T5, T6 and T7 and c. 94m AOD at T4. The lowest part of the southern cluster is close to the proposed location for T8 at c. 85m AOD.

There are several eskers running through the Main Wind Farm Development site, some of which show signs of having been locally used for sand and gravel extraction. There are no residential properties within the site. Rosmead House (with associated structures) is a building of heritage interest to the south of the Main Wind Farm Development Site. Other features of heritage interest with potential to be impacted by the Proposed Development are described in **Chapter 12**.



1.4 The Application and EIAR Requirement

Given the nature and size of the Proposed Development, it meets the mandatory requirements for Environmental Impact Assessment (EIA) as defined in European and national legislation. Therefore, an EIAR documenting the EIA process has been prepared in accordance with the Planning and Development Regulations 2001 (as amended) and the European Union Directive 2011/92/EU (the EIA Directive) as amended by Directive 2014/52/EU.

The Planning and Development Act 2000 was amended in 2006 to require certain applications for permission for major infrastructure projects to be made directly to An Bord Pleanála, rather than to the local planning authority, as would have previously been the case.

Such projects are known as Strategic Infrastructure Development (SID). As the Proposed Development will exceed 50 megawatts (MW) of power output, the project qualifies as SID Two pre-application consultation meetings were held with An Bord Pleanála, on 22nd October 2022 and 6th March 2023, respectively. An Bord Pleanála issued a decision on 24th August 2023 indicating that the Proposed Development is considered SID.

Section 37E(i) of the PDA 2000 also requires that an application for permission for development in respect of which a notice has been served under section 37B(4)(a) shall be accompanied by an EIAR in respect of the proposed development.

As well as an EIAR, an Appropriate Assessment Screening and Natura Impact Statement has been prepared in compliance with Article 6 of the Habitats Directive. This report considers potential impacts on nearby nature conservation areas known as Special Protected Areas (SPAs) and Special Areas of Conservation (SACs).

1.5 The Applicant

The applicant is Knockanarragh Wind Farm Ltd. a wholly owned subsidiary of Statkraft Ireland. Statkraft is one of the biggest renewable energy developers in Ireland with over 4GW pipeline of offshore, onshore, solar and grid services projects. The Statkraft Ireland team, which is based in Cork and Tullamore, Co. Offaly, has constructed a portfolio of almost 350MW of renewable energy projects across the country, operates over 500MW, and has an established track record in wind energy in Ireland having previously developed previously wind farms in Counties Clare, Cork, Kerry, Donegal, Limerick, Galway, Waterford, Tipperary, Offaly, and Tyrone.

1.6 Land Ownership

Ownership of the lands associated with the Proposed Development are a combination of lands owned by private landowners.

1.7 EIAR Structure

The format of this EIAR is designed to ensure that a consistent and logical approach is used to describe the potential significance environmental effects arising from the Proposed Development. The general approach is described in **Chapter 1**, and full details of methods followed in accordance with specific industry guidance are set out in the separate chapters for each topic, e.g. biodiversity, water, etc. The description of the existing environment, the Proposed Development and the potential impacts, mitigation measures and residual impacts are grouped in each chapter. Each of the specialist assessments within the EIAR considers the list of developments in the wider area that have potential to result in cumulative impacts.

The grouped format makes it easy to investigate topics of interest and facilitates cross reference to specialist studies. Additionally, there is a need to ensure that the EIAR is readily



accessible to the general public, as well as statutory authorities. The EIAR is structured as follows:

- Chapter 1 Introduction
- Chapter 2 Project Description
- Chapter 3 Alternatives
- Chapter 4 Population and Human Health
- Chapter 5 Biodiversity
- Chapter 6 Land, Soils and Geology
- Chapter 7 Water
- Chapter 8 Air and Climate
- Chapter 9 Noise and Vibration
- Chapter 10 Landscape and Visual
- Chapter 11 Shadow Flicker
- Chapter 12 Cultural Heritage
- Chapter 13 Material Assets
- Chapter 14 Traffic
- Chapter 15 Major Accidents and Natural Disasters
- Chapter 16 Interactions
- Chapter 17 Schedule of Mitigation Measures

The structure of this EIAR is as follows:

- Volume I – Non-Technical Summary (NTS)
- Volume II – Main EIAR
- Volume III – Appendices to the Main EIAR
- Volume IV –Photomontages

A Natura Impact Statement (NIS) has also been submitted with the planning application. The planning application is also supported by a Planning Statement and planning drawings.

The Figures, Tables and Appendices that have been prepared within this EIAR are numbered with the chapter number first followed by the figure / table / appendix number for easy reference.

1.8 Permission Period

The applicant respectfully requests that its 10-year permission period is granted in addition to a 35-year operational period.

1.9 Competent Experts

A highly specialised multi-disciplinary team of environmental consultants was commissioned to undertake the EIA process. In accordance with the requirements of the EIA Directive, details of qualifications and experience across the team is demonstrated in **Chapter 1**.



2.0 The Need for the Development and Alternatives

The Proposed Development is necessary to produce renewable energy for the Irish national grid in order to transition Ireland to a low carbon economy. The Climate Action Plan 2023 (CAP23) commits Ireland to a legally binding target of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030. Among the most important measures in the plan is to increase the proportion of renewable electricity to up to 80% by 2030.

The Climate Action Plan 2024 (CAP24) is the third annual update to Ireland's Climate Action Plan. The Plan was approved by Government on 20 December 2023, subject to Strategic Environmental Assessment, Appropriate Assessment and public consultation.

It reiterates the obligations set out in CAP23 and points to the need for action to reduce emissions to be significantly accelerated in the period to 2030.

The Proposed Development supports the delivery of targets within CAP23 and CAP24. If permitted and once constructed, it has an estimated power output of between 52.8 and 57.6 MW. Over the operational lifetime (35 years) of the Proposed Development has the potential to displace between 1,678,665 and 1,834,432 tonnes of CO₂. Therefore, the Proposed Development supports the delivery of targets within CAP 23 and CAP 24. therefore playing a critical role in providing renewable electricity in the Republic of Ireland.

A full review of the Proposed Development against all applicable national, regional and local policies is contained in the **Planning Statement** which also accompanies the application.

2.1 Alternatives to the Proposed Development

A review of reasonable alternatives considered by the developer in the design of the final Proposed Development has been set out in **Chapter 3** of the EIAR, in accordance with EIA requirements and consultation undertaken as part of the EIA process. The alternatives options considered were in relation to the following:

- 'Do Nothing' alternative;
- Alternative locations;
- Alternative technologies;
- Alternative design and layouts; and
- Alternative cable routes & haul routes.

Under the "Do-Nothing" alternative, the Proposed Development would not go ahead, the development of wind turbines would not be pursued, and the site would remain in use as evolving managed farmland, woodland and maturing commercial forestry. The State's ability to produce sustainable energy and add to the decarbonisation requirements under EU targets and National targets, as set out above, would be limited.

At the outset, an assessment of alternative locations was undertaken based on criteria such as environmental designations, wind resources and grid availability to avoid such locations in favour of those that have fewer constraints. A review of datasets in relation to all of the above indicated that the application site was a favourable location for the Proposed Development.

Similarly, a review of alternative technologies concluded that wind development would be the most appropriate in the case of the Proposed Development Site.

2.2 Consultation Feedback

Alternative designs and layouts across all elements of the Proposed Development have been developed and evolved continuously throughout the development of proposals. This has been done through a process of iterative feedback between the design team and the EIA team, as



well as through incorporation of comments received from a range of consultees during a targeted consultation on the scope of the EIA, and from local residents through continuous community consultation. Details on consultation and public participation are provided mainly in **Chapter 1** and **Appendix 1-4**, but also within the specific topic chapters of the EIAR where there was feedback in relation to specific areas.

3.0 Description of Proposed Development

3.1 Proposed Development

The main elements of the Proposed Development will consist of:

- Construction of 8 No. wind turbines with an overall ground to blade tip height of between 175m – 180m inclusive. The wind turbines will have a rotor diameter ranging from 155m to 162m inclusive and a hub height ranging from 97.5m to 99m inclusive. Each turbine will have individual output of between 6.6MW to 7.2MW inclusive.
- Construction of temporary crane hardstands and permanent turbine foundations.
- Construction of permanent internal site access roads including passing bays and all associated drainage infrastructure
- Construction of 1 no. permanent 110 kV electrical substation west of Clonmellon, Co Meath to include 2 no. control buildings with welfare facilities, all associated electrical plant and equipment, security fencing and gates, all associated underground cabling, wastewater holding tank, and all ancillary structures, bunding and works.
- Construction of 33kV underground electricity cabling, including joint bays and ancillary works, along the L5542 and N52 connecting the Main Wind Farm Development Site: to the Proposed 110kV Substation at Clonmellon.
- Construction of a section of 110kV electricity cabling between the Proposed 110kV Substation and the existing overhead line at Clonmellon, inclusive of 110kV interface masts.
- Construction of an internal collector cable circuit within the Main Wind Farm Development Site, including directional drilling of (125m) cabling between Turbine 5 and Turbine 8.
- Construction of two construction compounds with associated temporary site offices, parking areas, welfare facilities and security fencing.
- The use of the construction compound in the Southern Cluster as a maintenance hub to facilitate the operational phase of development.
- Development of two borrow pits for the purpose of stone extraction.
- Undergrounding of approximately 610 metres of existing 10 kV overhead electrical power line in the vicinity of Turbine 6.
- Development of an internal site drainage network and sediment control systems.
- Improvements to an existing site entrance off the L5542/Carnybrogan local road to include localised widening of the road and creation of a splayed entrance to facilitate the delivery of abnormal loads and turbine component deliveries. Improvements will include removal of existing vegetation to accommodate visibility splays.
- A new site entrance and slip road from the L5542/Carnybrogan local road to facilitate the delivery of abnormal loads and turbine component deliveries to northern part of the site.



- Road improvements to L5542/Carnybrogan local road to facilitate the delivery of abnormal loads and turbine component deliveries.
- A new site entrance to T8 from the N52 via an existing agricultural access within the townlands of Cavestown and Rosmead.
- A new site entrance from the L6821 to the Proposed 110 kV Substation at Clonmellon.
- Ancillary forestry felling of between 19.62ha and 20.09ha to facilitate construction of the development.
- All associated site development works including berms, landscaping, and soil excavation and the ongoing maintenance and management of the biodiversity measures in accordance with the Habitats and Species Management Plan.
- Measures for biodiversity enhancement including wader scrapes for snipe, stockproof fencing and other measures.
- The enhancement and replacement of hedgerows and broadleaf trees and the planting of new hedgerows and trees.

This planning application seeks a 10-year construction period and a 35-year operational life for the Wind Turbines from the date of operation of the entire Proposed Development.

3.2 Elements of the Proposed Development

The following are the main elements of the Proposed Development:

- Turbines and associated infrastructure, consisting of:
 - o 8 no turbines across two clusters – the **Northern Cluster** consists of 3 no. turbines (T1, T2 and T3) while the **Southern Cluster** consists of 5 no. turbines (T4, T5, T6, T7 and T8).
 - o 2 no. borrow pits for rock/aggregate extraction through rock breaking (and blasting where necessary) to meet the requirement construction material. The availability of appropriate aggregate material at the proposed borrow pit locations will be confirmed with site investigations being completed prior to construction.
 - o Turbine hardstands will utilise material extracted from borrow pits and supplemented by local quarries if needed.
 - o 6km of access tracks connecting the turbines to all associated and ancillary infrastructure. Stone materials required from these access tracks are to be sourced from the on-site borrow pits.

The detailed specification of turbines is to be finalised, but will be within the following parameters:

- height of between 175 - 180 m from top of foundation (at ground level) to blade tip height.
- rotor diameter within the range of 155 - 162m (inclusive).
- hub height within the range of 97.5m - 99m (inclusive).

Modern wind turbines from all main turbine manufacturers have evolved to share a common appearance and major characteristics with only minor cosmetic differences which differentiate one manufacturer from another.



- Substation

It is proposed to construct a 110kV electricity substation which will provide a connection point between the proposed wind farm and the national grid. The substation will include necessary electrical components and 2 no. substation control buildings, including staff welfare facilities. The substation compound will be surrounded by a 2.6 metres high steel palisade fence and internal fences will also be provided to segregate different areas within the main substation compound.

- Grid Route

A 3.85km 33kV underground cable route will leave the Main Wind Farm Development site (comprising the 8 turbines within the northern and southern cluster), running along the L5542 in Westmeath, then following the N52 north into the village of Clonmellon, and then west along the L6821. It then turns north into the substation Site. The underground cables will be laid in the track verges.

A section of 110kV electricity cabling will be required from the Proposed Substation to the existing overhead line at Clonmellon.

- Turbine Delivery Route (TDR)

The turbine components will be delivered on site where they will be placed on hardstanding and laydown areas prior to assembly. The turbine hardstanding will include provision for temporary crane pads with sufficient bearing capacity for heavy loads expected. The components include the turbine towers which are delivered in sections, and the turbine blades which will be delivered individually. Once all components are available and there is suitable weather each turbine will be assembled.

Each turbine will take approximately 3-4 days to erect, weather dependent and will require two cranes in the assembly process. The turbines will then be commissioned and tested. Turbine delivery will be from Dublin port. The TDR will leave Dublin Port and join with the M50 motorway via the Dublin Port Tunnel. The route will continue along the M50, exiting at Junction 7 to the M4 to Mullingar then exiting Junction 16 northbound on the N4 on to the N52 and L5542 to the site.

- Tree Felling

Felling of between 19.62ha and 20.09ha of forestry is required within and around the wind farm infrastructure to facilitate construction. The Felling area proposed is the minimum necessary to construct the Proposed Development.

Tree felling will be subject to a felling licence application to the Forest Service within Department of Agriculture prior to construction. Replant lands are required and this replanting of forestry can occur anywhere in the state, subject to licence. Potential replanting sites will be subject to a separate application.

3.3 Site Drainage

The Proposed Development will manage the hydrology within the Site by keeping clean water within the Site clean by avoiding disturbances and collecting drainage water from works areas that might carry silts or sediments, channelling them to settlement ponds or controlled diffuse release over vegetated natural surfaces. Drainage infrastructure will be constructed in parallel with access track construction. Further details on the hydrology and drainage are set out in **Chapter 7** of the EIAR.



3.4 Power Output

The Proposed Development will have an estimated installed capacity of 52.8MW (SG 155) to 57.6MW (V162) depending on the final turbine technology installed. Assuming an installed capacity of 52.8- 57.6 MW, the Proposed Development has the potential to produce approximately 152,634 (SG155) to 166,510 (V162) MWh (megawatt hours) of electricity per year. This has been estimated as provided enough capacity to produce enough electricity for the equivalent of 96% to 116% of households in County Westmeath and 45% to 54% of Meath, based on 2022 CSO census data.

3.5 Construction Programme

It is envisaged that the construction period will take place over a period of 18-24 months. This would follow a broad sequence of site preparation work, turbine foundation construction and turbine erection, followed by construction of substation and grid connection.

The main construction works which are expected to generate the most vehicle trips to the site will be undertaken during months 5 to 11, with the final 5 months of the construction programme accommodating the wind turbine deliveries and erection. A more detailed construction programme and construction methodology are contained in **Chapter 2** of the EIA.

A Construction Environmental Management Plan (CEMP) is provided as **Appendix 2-2** to Chapter 2 and contains details of the proposed best practice construction methods, handling of waste etc. Waste would need to be transferred to a licensed waste management site or site with a waste exemption. A record of waste movements will be completed by all parties involved and must be retained for a period of two years. The CEMP will be continually updated throughout the construction process.

3.6 Traffic Management

3.6.1 Wind Farm

Access to the wind farm will be facilitated as follows:

- Construction and operational access for T1, T2 and T3 via local road L5542 which passes through the townland of Carnybrogan, approximately 2 km south west of the town of Clonmellon. (Site Entrance 1).
- Construction and operational access for T4,T5,T6,T7 proposed via the local road L5542 (Site Entrance 2).
- Construction and operational access to T8 via the N52 within the townlands of Cavestown and Rosmead. (Site Entrance 3).
- Construction and operational access to the proposed 110kV substation from the L6821. (Site Entrance 4).

3.6.2 Turbine Delivery Route

The port of entry for materials required to be imported has been identified as Dublin Port, with a route via the M50 and M4 to the N52. Delvin Junction. Turbine deliveries would exit the M4 at this location and head toward Delving via the N52.

A report has been prepared to identify the works to be carried out along the TDR to facilitate the delivery of the wind turbine components to the site of the Proposed Development without any obstructions from street furniture, natural elements and utilities along the route. The TDR report is included as an appendix to Chapter 14 of the EIA.



3.6.3 Traffic Management During Construction

A Construction Traffic Management Plan (CTMP) for the Proposed Development has been included as Appendix 14-3 to **Chapter 14** of the EIAR. The purpose of the CTMP is to outline the areas for consideration when preparing the programme of works and when undertaking the Site construction. It is to be used during the construction phase of the Proposed Development

3.6.3.1 Road Closures

Cable trenching will be carried out with the aid of single lane closure on the N52 and temporary closure of the L5542. A traffic management plan has been prepared and will be subject of agreement with the Transport Infrastructure Ireland, An Bord Pleanála and the relevant local authorities, as appropriate, prior to commencement of works.

Due to the length of cabling within the road corridor (c. 3.85 km), these works could be conducted over a 6-month period of time (c. 26 weeks). The approach will plan the works to ensure minimal impacts on road users and the general public.

3.7 Operation

During the operational phase of the Proposed Development, turbines will operate automatically on a day-to-day basis. The turbines will respond to changes in wind speed and direction by means of anemometry-equipment and control systems.

Twice a year each turbine will undergo a schedule service. The operation of the wind turbines will be monitored remotely, and a caretaker will oversee the day-to-day running of the proposed windfarm.

At the end of this 35-year lifespan, subject to planning permission, the turbines may be replaced or the site decommissioned.

3.8 Decommissioning

During the decommissioning phase of the Proposed Development, the turbines will be fully disconnected from the power supply. The internal components of the turbine will be removed prior to the dismantling of the turbines using cranes in a similar manner to the construction but in reverse. The turbine will be removed to approximately ground level and the components will be transported off site for re-use or recycling.

Turbine crane pads are likely to require remedial works (removal of vegetation, levelling and recompacting of granular material) to ensure they are suitable to take the bearing loads of the cranes.

The turbine foundations will be covered over and allowed to re-vegetate naturally. Leaving turbine foundations in situ is considered a more environmentally sensible option. Removing the reinforced concrete foundation associated with each turbine would result in environmental nuisances such as noise and vibration and dust.

It is proposed that the internal site access tracks will be left in situ, subject to agreement with Westmeath and Meath County Councils and the relevant landowners.

The proposed substation will be taken in charge by ESB Networks /EirGrid upon completion and should be left in place permanently forming part of the national electricity network. Underground cabling will also be left in situ.



4.0 Population and Human Health

A study area of 1km radius of the Proposed Development Site was reviewed for the existence of potentially sensitive receptors.

The closest of these residences in each location have been selected as representative locations for the prediction of potential air and noise impacts. The assessments of general disturbance to the local community in this chapter have been based on those technical assessments.

The most recent (2022) census data was used in order to understand the local socio-economic situation within the Electoral Divisions of Rosmead, Ballinlough and Killua that intersect the Proposed Development Site. Local and regional planning related, tourism and wind energy policy documents and reports were also reviewed to understand any vulnerabilities within the area.

The population of the study area is 1,633, which is an increase of 7.4% on the previous census period (2016). The population density of the study area is far less than the state or County Meath, and to a lesser extent, County Westmeath, although it did see a small increase in population density between the 2016 and 2022 census periods. In particular, a higher percentage of persons in both the 15-24 and 45 - 64 age cohort was observed in the study area from 2016 to 2022, and these cohorts are represented in higher proportion within the study area than a Meath, Westmeath and the State. No particular health vulnerabilities were noted in the study area.

Non-manual and Skilled Manual workers are slightly higher represented within the study area than in Meath, Westmeath, and the State.

The existing land-uses in proximity to the Proposed Development will remain broadly unchanged during the construction phase of the Proposed Development. However, some land use in close proximity to the site (>500m) may be temporarily disrupted during the construction phase.

The Proposed Development has been estimated to result in the creation of approximately 63 and 184 jobs during its construction phase, and approximately 15-23 long term jobs during the operational phase. It can be assumed that this would have knock-on effects to indirect employment in the local economy.

Investment in the local area is also anticipated to be provided as a result of the Proposed Development in terms of developer contributions that will be paid as part of planning conditions (if permission is granted). Under national policy incentivisation measures, a special Community Benefit Fund scheme will also be set up direct funds to local communities if planning permission is granted. It is anticipated that the community benefit fund for the Proposed Development could deliver approximately €300,000 per year (based on the 7.2MW output per turbine scenario). Following public consultation, it was made clear that part of this fund should be ring-fenced to provide support to the residences in closest proximity to the Proposed Development, a Near Neighbour scheme. The extent of the overall benefit fund to be allocated to the Near Neighbour scheme and the distribution of the balance of community benefit funds is to be further discussed and agreed with the community in future engagement.

Provision of large scale on-shore wind energy projects are recognised as contributing greatly to the national economy in terms of associated investment as well as cost savings related to CO₂ displacement (e.g. consumer savings and avoidance of penalties for non adherence to carbon budgets). Research undertaken by Bord Fáilte in relation to wind projects indicates that they do not significantly impact the tourism economy. Other research also indicates that impact on the landscape is not a major concern for those living near an existing wind farm.



Research regarding potential health impacts as a result of operational wind turbines concludes that there is no scientific consensus to support the association between negative health impacts and wind energy developments with particular regard to noise and electromagnetic interference. The technical chapters of the EIAR provide details of the potential for environmental emissions such as noise, air and water and recommends mitigation measures where such potential exists. With the implementation of these measures, which are largely best practice construction measures, there is negligible risk to human health predicted as a result of the Proposed Development.

5.0 Biodiversity

Chapter 5 of the EIAR assesses the potential for the construction, operation and decommissioning phases of the Proposed Development to result in significant effects on Biodiversity.

Comprehensive desk and field studies were conducted to identify important Biodiversity Features at the Knockanarragh Site and within the potential zone of influence of the project. Desk and field studies commenced in 2019 and were ongoing to 2023 to inform this assessment. Studies included a thorough review of available information and consultation with Department of Arts, Heritage, Regional and the Rural and Gaeltacht Affairs (Development Applications Unit), Inland Fisheries Ireland, Meath County Council and Westmeath County Council. The field surveys and desk studies were undertaken by highly experienced ecologists from within SLR Environmental Consulting (Ireland) Ltd, MKO, Triturus Environmental Ltd and RSK. The surveys conducted included multi-year bird surveys based on best practice methods (NatureScot, 2017), habitat surveys, specialised fen and ancient woodland botanical surveys, surveys for rare flora and invasive plants, surveys for terrestrial mammals and bats, marsh fritillary surveys, and fisheries and aquatic ecology surveys.

5.1 Biodiversity Features

The Proposed Development overlaps with the River Boyne and River Blackwater cSAC. There are eight SACs and two SPAs within 20 km of the Proposed Development. Of these, the River Boyne and River Blackwater cSAC, River Boyne and River Blackwater SPA and Lough Derravaragh SPA are the only ones with any connection to the Project, with downstream hydrological connections to the River Boyne and River Blackwater cSAC/SPA, and a potential weak ecological connection to Lough Derravaragh SPA. Key habitats considered in the assessment include alkaline fens. Key species considered in the assessment include lamprey species, salmon, otter, kingfisher, whooper swan, pochard, tufted duck and Eurasian coot.

Annex I transition mire and quaking bog habitats were present nearby to parts of the Proposed Development, as were previously possible mapped ancient woodland habitats. No rare or protected plants were recorded during field surveys, although two such plants are recorded in biodiversity records relating to the main wind farm site.

Invasive and non-native plants Japanese knotweed, cherry laurel and snowberry were recorded by field surveys, but only cherry laurel and snowberry were recorded within the development footprint for the Proposed Development. Japanese knotweed is the only species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011-2021 (S.I. 477/2011).

Bird species identified within and around the Proposed Development as important ecological features and subject to detailed assessment included barn owl, black-headed gull, common kestrel, common snipe, Eurasian curlew, Eurasian teal, Eurasian woodcock, European golden plover, great cormorant, hen harrier, mallard, merlin, mute swan, northern lapwing, peregrine falcon and whooper swan. In general, there were very few 'at risk' flights for any species,



although there were some large flocks of European golden plover, and to a lesser extent, northern lapwing.

Five species of mammals were recorded within or nearby the Site which include badger, pine marten, red squirrel, red fox and feral goats. There were four structures identified to have moderate potential to be used by roosting bats, with the ruins of Rosmead House the most important roost. All confirmed roost structures are outside of the development footprint. There were also 38 trees with potential roost features within the Proposed Development, but these are outside the footprint of proposed works.

Common frog and smooth newt recorded by surveys within a limited number of pond sites at the Proposed Development. Fifty-nine marsh fritillary larval webs were recorded c. 190 m outside the development footprint.

There were no Annex I aquatic habitats within or downstream of the Proposed Development. Watercourses in the area showed evidence of having been heavily modified. Key species recorded included salmonids, brook lamprey and otter, albeit in low numbers, although there were several high value salmon nurseries in the survey area. White-clawed crayfish was also found but only at a single survey site.

SACs and SPAs are fully considered within the NIS.

5.2 Potential Impacts

A potential impact of accidental water pollution on mobile otter from Royal Canal pNHA, if unmitigated, has been identified.

There will be no loss of Annex I or potential ancient woodland habitats, with most of the habitat loss predicted to occur for agricultural fields and commercial forestry. Without mitigation, dewatering could affect Annex I transition mire and quaking bog habitat. Also, invasive and non-native cherry laurel and snowberry could be spread by construction works.

Effects on avifauna associated with habitat loss, disturbance, displacement, collision and barrier effect were assessed in detail. Without mitigation, effects of habitat loss, disturbance and displacement could affect breeding common snipe, Eurasian woodcock, yellowhammer and meadow pipit.

Low levels of collision are also predicted for bats but are not likely to translate into significant effects on populations.

Without mitigation, pollution to downstream watercourses could affect salmon, lamprey, white-clawed crayfish, European eel and otter.

A review of other plans and projects in the surrounding area was undertaken, exploring the possibility of cumulative impacts on important ecological features. The potential for significant cumulative impacts of collision on European golden plover, Eurasian curlew, common kestrel, northern lapwing, mallard peregrine falcon and whooper swan.

Detailed mitigation measures are provided within the main body of the EIAR to be put in place to protect downstream water quality, birds, bats, terrestrial mammals, habitats and prevent the spread of invasive species. Following these mitigation measures, the following conclusions were determined.

The NIS considered that with mitigation measures, the Proposed Development would not give rise to any appreciable effects on Natura 2000 sites.

Proposed mitigation will ensure that there will be minimal residual effects on important ecological features. The only potentially significant residual effects identified are the loss of breeding territories to Eurasian woodcock at the local scale.



Chapter 5 sets out a series of proposed biodiversity enhancement measures. Amongst the most noteworthy is the replacement of 98.9 m of treelines, and 548.86 m of hedgerows in situ. This is in addition to the proposed 13.69 hectare replant woodlands to be provided off-site. There will be 1,461.14 m additional new hedgerow and 396.11 m additional treeline planted than will be needed to replace any due to be lost, which will result in a net gain of hedgerow and treeline due to the Proposed Development. These will be designed to ensure connectivity between habitat features at the Proposed Development is maintained and enhanced. The replacement of treelines and hedgerows will also ensure that there is no net biodiversity loss as a result of the Proposed Development.

6.0 Land, Soils and Geology

Chapter 6 of the EIAR assesses the potential effects of the Proposed Development on Land, Soils and Geology.

The study area comprised an area of 2 km surrounding the Proposed Development and the TDR area, which will follow an existing road network and not have any direct interaction with land, soils and geology. The baseline data has been established through desk study and survey work.

6.1 Features within the Study Area

Land use within the study area has been reviewed using OSI historical data from the 1800s to recent aerial imagery and site visits during the EIA process. Current land use is a mixture of agricultural fields, woodland, housing, the village of Clonmellon to the north, a quarry and farms. Corine Landcover mapping (2018) indicates the two predominant land uses in the study area are agricultural and forested lands. The TDR is land which is in use as part of the existing regional, national and road network between the Site and Dublin Port.

The Proposed Development Site is predominantly underlain by the Elton series of soils which is a fine, loamy soil which is considered to have good agricultural potential. Other mapped soils in the study area are peat (north underlying T1 and T3 and at T7 turbine locations) and soils which originally formed within flowing water environments such as rivers (known as alluvium, to the northwest).

Subsoils beneath the Proposed Development and the study area are predominantly comprised of limestone sands and gravels and limestone glacial deposits containing a range of grain sizes from clay to boulders (till). There are also occurrences of peat, sands and gravels formed from glacial meltwater deposits within linear features (eskers), lake derived subsoils (lacustrine) and alluvium within the study area. The peat occurrences are subdivided into two types – the northern peat underlying T1 and T3 is noted as fen peat and to the south it is mapped as cut peat.

6.2 Assessment Work

Site investigation work was carried out in October 2022, August 2023 and March 2024 by SLR to investigate the presence of peat near T1, T3 and T7. The October 2022 peat probing survey work identified that the southern area which is publicly mapped by the GSI (GSI, 2023) as “cut peat” around T7 has no peat present. This is because it was removed historically by cutting of the peat. Peat was identified in the area of T1 during the October 2022 and August 2023 peat probing surveys, and in the area of T3 during the March 2024 survey.

Using the survey data collected during peat probing, a Peat Landslide Hazard & Risk Assessment (PLHRA) was undertaken by SLR. The purpose of the PLHRA is to consider the potential risk of peat slides occurring at the Site and to discuss controls and methodologies which can be employed during construction and commissioning to mitigate potential risks. The



thickness of peat, assessed using data collected from peat probing, indicates that the majority of the area surveyed has peat thickness which is <1.5m. The PLHRA identified that the Site is a low-lying area with no significant hill slope gradients, the proposed wind farm infrastructure will generally avoid the thickest areas of peat and there is no evidence of historical peat slide activity (having reviewed aerial imagery back to 1985). The PLHRA found that the risk of slope instability due to peat around T1 and T3 is low to negligible.

The bedrock underlying the Proposed Development is from the Lucan Formation, a rock unit which is part of the Lower Carboniferous time interval. The Lucan Formation comprises a mixture of limestones and shales with chert bands. No major geological structures (i.e faults) are recorded at the Site on GSI geological mapping. Public borehole log data for the area was reviewed as part of the baseline bedrock study. A borehole record (ID RN-1245-1) was drilled by Rio Tinto in 1998 and was reviewed. It was drilled within the Site area and is located c. 125 m west of turbine location T6. The borehole encountered 6.44 m of overburden before encountering 13.56 m of the Lucan Formation. Beneath the Lucan Formation, the borehole encountered other Lower Carboniferous rock units including the Waulsortian Limestone Formation, Argillaceous Bioclastic Limestone, Shaley Pales and sequences of sandstones, shales and muds to a depth of 838.1 m. Bedrock beneath the TDR comprises various sequences of Carboniferous limestones, shales and sandstones as well.

The baseline also considers geological heritage, economic geology, radon and karst in the study area. No geological heritage sites are found within the study area. One existing quarry is located near to the Northern Cluster but outside of the Site. Historical records for quarries and pits in the area indicate gravel pits have historically operated in the study area. Radon is a naturally occurring gas formed through the radioactive decay of uranium in predominantly igneous and associated soils. Radon gas can be a concern within buildings as the gas can collect on the ground floor. EPA mapping (2023) indicates that 1 in 10 homes in the study area are likely to have high radon levels with some areas to the north likely to have 1 in 20 homes with high radon levels. No karst features are mapped within the study area.

Once the baseline was established for land, soils and geology, the assessment then defined the potential land, soils and geology receptors, or other receptors which may be potentially affected by land, soil and geology during the lifecycle of the Proposed Development. The receptors brought forward into the impact assessment are 'land' (in terms of land use), 'soils and subsoils', 'bedrock' and 'human health/built structures' in the context of human beings such as workers onsite and the site infrastructure.

The impact assessment process considered the potential effects during the construction, operation and decommissioning phases of the Proposed Development.

During construction potential impacts include forestry removal, material excavation, fuel and oil leaks and spills and peat instability around turbine location T1.

During the operational phase of the Proposed Development, there will be no new direct effects to land, soils, subsoils and bedrock due to the Proposed Development.

During decommissioning, machinery and plant operating on site represent a risk of fuel and oil spills or leaks, similarly to the construction and operation phases.

Mitigation measures during construction include site operations being managed in accordance with relevant Health and Safety legislation, maintained fencing, evaluated stockpiles, the area of bare or exposed soils and rock will be kept to a minimum, all aspects of the proposed backfilling / construction phase works to be undertaken in accordance with relevant best practice environmental guidance published by the Environmental Protection Agency and other regulatory agencies and various measures to deal with potential accidental fuel / oil spills. Detailed mitigation measures have also been included for the areas of peat which have been recognized in the area of T1 and T3. In particular, mitigation measures will be put in place during construction which will become part of the inherent design during the later phases of



the project (such as careful micro site of wind turbine bases, hardstandings and access track alignments to minimize effects on prevailing hydrology).

Mitigation measures applied during decommissioning and operational activities will be similar to those applied during construction where relevant.

With respect to residual impacts, the implementation of the proposed mitigation measures, it is considered that the potential effects of fuel spill on soils and bedrock, will reduce to Imperceptible. With the implementation of the range of mitigation measures identified in **Chapter 6**, slight residual effects for potential peat instability and loss of soils and subsoils through material excavation are predicted.

During construction peat will be excavated in the area of the turbine location to allow it to be built, reducing the depth of peat at this location. Signs of peat instability would be the cracking of the land surface, change in levels or slumping or foundations and concrete bases associated with the wind turbines which would be viable during site inspections and standard maintenance works. Remedial measures would be implemented to prevent a failure event and it is considered that the potential effect of peat instability would be Not Significant.

7.0 Water

For the purposes of this assessment, the Study Area comprises the area within a 2 km buffer of the proposed permanent footprint of the Proposed Development. The Proposed Development Site is situated across two sub-catchments within the wider Boyne catchment (Boyne_SC_050 and Boyne_SC_070). The D'arcy Crossroads Stream runs along the north-western boundary and the Killacroy Stream runs along the northern boundary, in an east-west direction, where it ultimately joins the Darcy Crossroads Stream.

7.1.1 Water Features

Approximately 1.8 km south-west of the confluence, the Darcy Crossroads Stream flows into the River Stonyford and forms a part of the River Boyne and River Blackwater SAC). The River Stonyford flows in the south-east direction for approximately 19 km where it joins the River Boyne. The proposed cable route will cross two sections of the Athboy River as it enters Clonmellon to the north of the Proposed Development.

A Water Framework Directive (WFD) assessment has been completed which identifies these watercourses to be predominantly Poor-Moderate quality and at risk. Additionally, there are a number of water quality monitoring locations monitored by the EPA at locations adjacent to and downstream of the Proposed Development and the cable route. The most recent Biological Water Quality Ratings at these stations are Q3-4 to Q4 at all stations, which indicates "slightly polluted" to "unpolluted" status.

The Newtown Lough Fen is located to the east of the Northern Cluster and is upstream of the River Stonyford. There are also a series of small surface water ponds across the study area, which are associated with gravel esker deposits, particularly to the east and southeast of the Northern Cluster.

7.2 Hydrological Arrangements for Proposed Development

No constraints for the proposed wind turbine locations for the current scheme were noted in terms of hydrology and hydrogeology during the site visits with the exception of an area of flood risk in proximity to T1 and location of a cSAC at this same location. A detailed drainage survey was undertaken in the area surrounding turbine T1 at the site and a Site-Specific Flood Risk Assessment (SSFRA) has been prepared for the Proposed Development.

The Proposed Development will utilise in total six crossings: two new crossings over the field drains and four existing crossings over a mixture of field drains and streams, which will be



upgraded. These water crossings will be overlaid with a geotextile membrane and brash to capture falling soil from machinery wheels and will be carefully monitored during the works.

The dark limestone and shale bedrock of the Lucan Formation underlying the Proposed Development is classified as a Locally Important Aquifer (LI) - Bedrock which is Moderately Productive only in Local Zones. Groundwater flow is considered to be entirely through interconnected networks of fractures, with flow from high elevations to low elevations. No karst features have been identified within a 5km radius of the Proposed Development. Groundwater vulnerability underlying the Proposed Development is predominantly classified as 'High', with lesser areas classified as 'Moderate'.

The Study Area is underlain by the Athboy Groundwater Body. A groundwater body is also shown associated with the Newtown Lough Fen groundwater-dependent terrestrial ecosystem (GWDTE). The GWDTE-Newtown Lough Fen (SAC002299) groundwater body is shown to the southeast of the lough. There is no gravel aquifer in the area. The WFD assessment found these groundwater bodies to have Good water quality status and are not at risk.

There are no public water schemes in the vicinity of the Proposed Development area. No groundwater supply wells have been identified within the 2km Study Area.

Construction phase activities of the Proposed Development will require earthworks resulting in the removal of vegetation cover and excavation of mineral subsoil. Cut peat areas have been identified on site. Exposed and disturbed ground, particularly peat, may increase the risk of erosion and subsequent sediment laden surface water runoff.

Contamination of surface water runoff from machinery, accidental leakage and spills of chemicals from vehicle use and the construction of hardstanding also have the potential to impact surface water bodies. Potential pollutants include oil, fuels and cement. If this was to occur it could negatively impact surrounding water features and any degradation of the water quality could impact on any unlisted private water supplies abstracting from the watercourse/aquifer.

Tree felling, access track construction, construction of the turbine foundations and other new, hard surfaces have the potential to result in a small increase in surface water run-off in the catchment. An increase in run-off has the potential to result in soil erosion and consequently sediment release into nearby receiving watercourses.

Dewatering of borrow pits and other deep excavations (i.e. turbine bases) have the potential to impact on local groundwater levels. Groundwater level impacts are not anticipated to be significant due to the local hydrogeological regime. Groundwater inflows may need to be pumped, resulting in short term localised drawdown of the water table and discharges to surface water channels. This could impact on groundwater levels and groundwater wells.

Clean and dirty (silty) water encountered onsite during the construction works will be separated, and dirty water will pass through a number of settlement lagoons and silt/sediment traps to remove silt before re-entering the water environment through percolation to ground or discharge to the surrounding drainage system.

In identifying and avoiding sensitive surface waters, the Proposed Development has implemented 'avoidance of impact' measures. A CEMP has been developed for the Project to ensure adequate protection of the water environment.

In order to mitigate potential impacts during the construction phase, best practice construction methods will be implemented in order to prevent water (surface water and groundwater) pollution. Good practice measures will be applied in relation to pollution risk, sediment management and management of surface runoff rates and volumes. Sustainable Drainage Systems (SuDS) will be used where applicable.



A 50m buffer distance between watercourses and any Proposed Development including construction activities including fuel storage was applied to those watercourses within the Site. No works will occur within this buffer with the exception of the development of T1. A special drainage report for works in this area is provided as an appendix to Chapter 7, which will guide works in that area where the 50 m buffer cannot be provided at this location. Water quality monitoring during the construction phase will be undertaken for the surface water catchments that serve the Site, to ensure that none of the tributaries of the main channels are carrying pollutants or suspended solids. Monitoring will be carried out at a specified frequency on these catchments.

During the operational phase of the Proposed Development, it is anticipated that routine maintenance of infrastructure and tracks will be required across the Site. This may include work such as maintaining access tracks and drainage and carrying out wind turbine maintenance. Mitigation measures outlined in the CEMP will be adhered to during any operational phase maintenance activities.

With the range of mitigation measures proposed in Chapter 7, it is projected that the potential for reduction in surface water and ground water quality and surface quality in bedrock aquifer from sediment release and accidental spillage/leaks on site will be of slight or lower significance.

Additionally, the Proposed Development will not cause a deterioration of the status of any surface or groundwater body under the WFD and will not undermine the attainment by any such body of good status.

8.0 Air and Climate

The principal sources of potential air emissions will be during the construction and decommissioning phases of the Proposed Development from activities such as:

- the wind farm and turbine delivery route elements of the Proposed Development;
- dust arising from earthworks, tree felling activities, and movement of vehicles on the Site;
- construction of new access tracks;
- the temporary storage of excavated materials;
- the construction of the cable route and proposed substation;
- the movement and use of construction vehicles and cranes;
- loading and unloading of aggregates/materials /movement of material around the site; and
- delivery of wind turbines.

8.1 Dust and Traffic Emissions

Dust emissions arise when particulate matter becomes airborne making it available to be carried downwind from the source and may cause dust soiling in the surrounding area. Dust control measures that will be implemented are identified in **Chapter 8** of the EIAR. The developer in association with the contractor will be required to implement a dust control plan as part of the Construction Environment Management Plan. There may still be slight fugitive dust emissions during construction activities. These will be localised and as they will be associated with certain elements of the construction phase and meteorological conditions, they will be temporary and will not result in any permanent residual impacts.



The prediction of the air quality impact for the construction phase of the Proposed Development did not consider the potential impact of traffic emissions, as it is not predicted that traffic would have a significant effect on the air quality. This is due to the projected trips generated falling below the screening criteria set out in industry guidance.

In terms of the TDR, there will be truck movements associated with delivering the wind turbines resulting in vehicular emissions and dust, however it will be done over paved surfaces thus dust soiling potential is very low along the route, once all wind turbines are delivered the truck movements will cease. Maintenance vehicles will access the Proposed Development and carry out point works along the proposed cable route during the operational period. However, given the low and infrequent traffic movements involved, the impact will be imperceptible.

Impacts related to vehicle emissions will practically cease following construction

Cumulative impacts may arise if the construction, operational and maintenance period of these projects occurs simultaneously with the construction of the proposed wind farm, cable route and substation development. This could result in slightly increased traffic emissions, however, provided the mitigation measures are implemented and the mitigation measures proposed for other developments are implemented, there will be no significant cumulative effects on air quality.

Once the proposed wind farm, cable corridor and substation are constructed there will be no significant direct emissions to the atmosphere. A diesel generator will be located at the proposed wind farm substation. However this will only be operated as a back-up/emergency power supply.

In terms of cumulative impacts, negative cumulative impacts in relation to air quality would only occur if a large development was in the vicinity of the Proposed Development or cable route and was being constructed at the same time. Following a review of developments, it is considered that this is not likely to act cumulatively in terms of dust during construction.

8.2 Climate Change

Carbon dioxide is a greenhouse gas which, if released in excessive amounts, can lead to increases in global temperatures known as 'global warming' or the 'greenhouse effect' which can influence climate change. The legally binding requirements for the State to reduce CO₂ emissions and to facilitate renewable energy to enable a transition to net zero carbon by 2050 are explained in **Chapter 8** of the EIAR.

An assessment of likely future climate changes has been undertaken and concludes that the Proposed Development Site will be resilient in extreme weather conditions. In terms of climatic impact of the Proposed Development itself, the appraisal considered the net impact that operating the Proposed Development will have in terms of CO₂ and its displacement of CO₂ from fossil fuels from other energy sources over the embodied carbon involved in its manufacturing, transportation, construction, and decommissioning using a carbon calculator tool. At present, the Proposed Development Site has limited peat habitats, most of the site has been cultivated, with commercial forestry and agricultural land dominating. Peat is not present throughout much of the site, with 87% of the Proposed Development site not meeting the 0.5 m depth of peat required for it to be categorised as peatland with a small area of peat being found in the proximity of T1 and T7.

There will be CO₂ emissions associated with the construction phase of the proposals and mitigation measures that can be implemented into this phase could include:

- Travel minimisation;
- Use of less fuel intensive machinery;
- Introduction of Biofuel and HVO run machinery;



- Waste material minimisation; and
- Implementation of best practices for environmental management.

9.0 Noise and Vibration

Chapter 9 of the EIAR considers noise and vibration associated with the construction and operation of the Proposed Development.

Baseline noise monitoring was carried out at six receptor locations surrounding the Proposed Development to establish existing levels of background noise in the vicinity and to then enable appropriate noise limits for the site to be derived. The standard approach to derivation of noise limits is to carry out baseline measurements at several representative noise sensitive receptors (NSR) around the proposed site. Noise limits are then derived for the properties at which the measurements were carried out based on the results of these measurements. As it is not usually possible to carry out measurements at every NSR, therefore NSRs nearest to the potential noise source are assigned as representative in terms of setting noise limits. The operational impact at each of the measurement locations was appraised in accordance with the Institute of Acoustic's Good Practice Guidelines.

The chosen noise monitoring locations were representative of the different noise environments in the vicinity of the Proposed Development in addition to being located at some of the closest dwellings to the proposed wind farm development. The baseline noise monitoring was used to derive appropriate noise limits according to the Department of the Environment, Heritage and Local Government DoEHLG Wind Energy Planning Guidelines.

Potential noise and vibration impact during the operational phase and construction phase were assessed.

On-site construction noise will be generated from the construction of the turbine foundations, the erection of the turbines, the excavation of trenches for cables, and the construction of associated hard standings and access tracks, and construction of the substation, vehicles on local roads and access tracks is also generated from the delivery of the turbine components, substation components and construction materials, notably aggregates, concrete and steel reinforcement. There is potential for temporary elevated noise levels due to the cable route works but these may only occur for only short periods of time at a very limited number of dwellings. The construction noise assessment has determined that associated levels are expected to be audible at various times throughout the construction programme but remain with acceptable limits such that their temporary effects are not significant.

The nearest noise sensitive locations are sufficiently distant that vibration will not be perceivable by residents at their dwellings and building damage will not occur from construction incurred vibration.

No other wind farms have been identified that would cumulatively add to the noise from the Proposed Development, nor would the Proposed Development add to noise from another wind farm, as such no cumulative noise effects are likely.

Draft Revised Wind Energy Development Guidelines (December 2019) published by the Department of Housing, Planning and Local Government proposes amendments to the Wind Energy Development Guidelines 2006. These draft guidelines are currently under review and are yet to be adopted, with further revisions to the text, including noise guidance, anticipated. Until such a time as these guidelines are re-published for public consultation, the 2006 Guidelines remain in place. Therefore, the noise assessment section of the draft guidelines are not considered best practice and had not been applied in this assessment.

Operational noise modelling has been based on the use of the manufacturer's sound power data for two options for the candidate turbines, which will be decided at a later stage. The



Siemens Gamesa SG155 6.6 MW and the Vestas V162 7.2 MW wind turbines have been separately assessed and are considered typical for the available scale of machine for this site.

Operational noise from both the proposed turbine options confirms that the predicted wind farm noise emission levels do not exceed the daytime or night-time noise limits derived in accordance with the 2006 Guidelines under all wind speeds and at all locations. The assessment demonstrates that the wind farm can operate without constraint or the need for mitigation and comply with noise limits derived from the 2006 Guidelines. These operation effects are not significant.

10.0 Landscape and Visual

The Landscape and Visual chapter of the EIAR assesses the impacts of the development on the landscape and visual amenity of the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

Landscape Impact Assessment (LIA) relates to changes in the physical landscape brought about by the Proposed Development, which may alter its character, and how this is experienced. Visual Impact Assessment (VIA) relates to assessing effects on specific views and on the general visual amenity experienced by people.

Production of this Landscape and Visual Impact Assessment (LVIA) involved baseline work in the form of desktop studies and fieldwork comprising professional evaluation by qualified and experienced Landscape Architects. This entailed a desktop study, including a review of local planning policy in relation to landscape character and views, and fieldwork.

Based on this, a Zone of Theoretical Visibility (ZTV) map was produced, which indicates areas from which the Proposed Development is potentially visible in relation to terrain within the wider study area of 20km radius from the site and the central study area within 5km radius of the site. Viewshed Reference Points (VRPs) from key visual receptors were also selected to be investigated during fieldwork for actual visibility and sensitivity.

10.1 Landscape Features

The landform of the site and the central study area is typified by small but frequent rolling terrain that sits around c. 90m AOD. The character of the wider study is rolling hills with progressively increasing elevation to the northwest, while the southeast progressively levels out to subtle undulations, except around river corridors.

In terms of land use and land cover, the immediate surroundings are highly varied, with the small hills of the site itself overlaid with small fields and hedgerows. To the south of the site is Rosmead House and Gateway. While these features are set within farmland, open fields punctuated with specimen trees retain some resemblance to the historic parkland character, further articulated by the presence of the historic structures. In contrast, there a quarry located in close proximity to the site and some patches of woodland and commercial forestry.

The agricultural farmland within the southern study area ranges from a complex patchwork of small pastoral fields, which often flank the outer periphery of the extensive peat bogs, to broad open fields where landform and road corridors allow. Girley Bog is located within the northeast quadrant of the study area, and several large-scale bogs are also situated within the southern half of the study area. There are a number of commercial conifer plantations, and demesne landscapes.

A landscape character assessment for County Westmeath is included within the current development plan. The landscape character assessment divides the county into 11 landscape character areas (LCAs) with the site situated in 'LCA 3 – River Deel Lowlands.



The largest settlements within the study area are Kells, 13.5km northeast, with Athboy 8.85km to the southeast, and Trim 19.2km southeast. Mullingar and Kinnegad occur at the far southern boundary of the study area, but do not substantially overlay the study area. The nearest town to the site is Clonmellon, which is located 1.95km northeast of the site along the N52 national road. To the south of the site (also along the N52) is Delvin 2.8km southwest.

The most notable transport route crossing the study area is the N52, which runs close to the eastern boundary of the site and passes diagonally from northeast to southwest across the entire study area. 10km northeast of the site, at Kells, the N3 transitions to/from the M3, which skirts the north of the study area. There is a relatively dense network of regional roads throughout the study area. The nearest to the site is R395, c.3km to the southwest.

The most notable heritage feature within the study area is the Loughcrew complex situated c. 10km northwest of the site. Loughcrew is the site of a megalithic cemetery containing up to 30 passage tombs and is located across three hills near Oldcastle in County Meath. The Loughcrew complex is located along the 225km Boyne Valley Drive, of which the nearest point to the site is c. 5km north at Kilskeer along the R154. The Boyne Valley Drive passes a number of other important heritage features also located within the northern and eastern half of the study area. These include the Tower of Lloyd, the Hill of Ward and Trim Castle. There is also a collection of Historical Residences, Estates, and gardens across the study area. The nearest such feature is Rosmead House and its distinctive 'Smiling Bess' gateway off N52. Ballinlough Castle (manor), gardens and golf course, which also hosts the 'Body and Soul' music festival is 1.5km east of the site. Killua Castle is 3.2km to the northeast and Clonyn Castle, in Delvin, is located c. 3.5km south, along with the ruins of Devlin Castle, situated along the main street (N52) of Devlin.

Whilst the central study area is not synonymous with outdoor recreation, many waymarked trails and walking routes are located in the wider study area. The most notable of these is the Royal Canal Way – a 144km national waymarked trail which follows the corridor of the Royal Canal throughout the wider southern half of the study area.

10.2 Potential Changes to Landscape

Landscape impacts are assessed in relation to direct physical impacts on the landscape fabric of the wind farm and substation sites as well as impacts on the landscape character of these sites. Consideration of the receiving landscape with regard to overall landscape character as well as the salient features of the wider and central study area including landform, drainage, vegetation, land use and landscape designations. A proportionate focus is applied to long term impacts on landscape character during the operational phase.

There will be physical impacts on the land cover of the site as a result of the Proposed Development, but these will be relatively minor in the context of this productive rural landscape. The scale of the proposed wind farm will be well assimilated within its landscape context without undue conflicts of scale with underlying land form and land use patterns. On balance of the landscape sensitivity judgements applied to the site and central study area weighed against magnitude of impact judgements the overall significance of impact is deemed to be Moderate-slight and Negative for both the site and central study area during the operational phase. Between 5-10km from the site the landscape impact significance is considered to reduce to Slight and then Slight-imperceptible from 10km to 20km. In terms of the significance of landscape effects for the Proposed Substation, the combination of sensitivity and magnitude judgements are considered to result in a Moderate-slight significance of landscape effect.



10.3 Potential Changes to Views

The visual impact assessment was informed by the preparation of photomontages (photo-real depictions) of both the wind farm and substation at a series of representative viewpoint locations. These photomontages are presented within Vol. IV of the EIAR. There were 33 viewpoints selected in respect of the wind farm and a further four selected to represent views of the substation.

Viewpoints were selected to represent a range of receptor types including; 'Key views' from sites of national / international importance; 'Scenic designations' from the relevant county development plans; 'Centres of population'; 'Local Community' views from the local road network within 5km of the development; 'Major Routes'; and, 'Heritage and Amenity' features. Whilst viewpoints might be selected to represent more than one of these receptor types 18 of the wind farm viewpoints (over half) were contained within 5km of the site where they are considered to represent local community views.

The highest sensitivity receptors are considered to be Lough Crew Cairns (VP1), the Tower of Lloyd (VP2) and Trim Castle (VP32), which were all assigned 'Very High' sensitivity judgments. The corresponding significance of visual impacts at these key views were deemed to be 'Moderate', 'Moderate-slight' and 'Slight' respectively.

Overall, visual impact significance ranged between Substantial-moderate, at two close viewpoint locations, down to 'Imperceptible' at five viewpoints where the Proposed Development will be seen at long distances and/or largely screened by intervening vegetation. Moderate significance is considered to occur at a further six of the viewpoint locations and these were generally confined to those within 5 km of the wind farm site with clear views of the proposed turbines. The remaining views ranged between Moderate-slight and Slight-imperceptible in terms of visual impact significance.

One of the two Substantial-moderate impacts occurred at VP19 from the N52 just to the east of the site, where clear and close views of the southern cluster of turbines are afforded within the surrounding farmland. In this case the two nearest turbines are within 250m, which is considerably closer than they could be to the nearest residential receptors due to required residential buffer distances. The other Substantial-moderate impact occurs within the private grounds of Rosmead House where the nearest turbines are seen in close proximity to the driveway leading up to the house. Although this level of impact is relatively high it is not considered to be a significant impact in EIA terms.

10.4 Cumulative Wind Project Proposals

At present there are no operating wind farms within the study area, however, Bracklyn Wind Farm is a permitted large-scale wind farm development situated in the southern portion of the study area some c. 6km south of the site. Situated immediately east of the permitted Bracklyn Wind Farm site, the proposed Ballivor Wind Farm is currently in-planning awaiting a decision from the Planning Authority. As a result, the cumulative assessment was divided into two sections, permitted baseline (with Bracklyn) and potential future baseline (with Bracklyn and Balivor).

The degree of cumulative impact between the proposed Knockanarragh Wind Farm and the permitted Bracklyn Wind Farm, is dependent on viewer location within the study area. Throughout the central study area, cumulative impacts are limited due the reasonable distance between the two developments, in combination with the flat landscape context which is strongly contained by vegetation. The highest likelihood of both developments being viewed in combination is from locally elevated parts of the landscape, specifically to the north of the study area. In terms of sequential cumulative views, the proposed wind farm will be potentially visible along with the Bracklyn Wind Farm at different times for those using the N51, N52, R156 roads and the Royal Canal. Overall, it is considered that the Proposed Development will



contribute an additional cumulative effect that is in the order of Medium-Low in combination with the Bracklyn Wind Farm and this will increase to Medium should the Ballivor Wind Farm also be realised.

Overall, it is not considered that there will be any significant landscape, visual or cumulative effects arising from the Proposed Development.

11.0 Shadow Flicker

Under certain combinations of geographical position, wind direction, weather conditions and times of day and year, the sun may pass behind the rotors of a wind turbine and cast a shadow over the windows of nearby buildings. When the blades rotate and the shadow passes a window, to a person within that room the shadow appears to 'flick' on and off; this effect is known as 'shadow flicker'. The phenomenon occurs only within buildings where shadows are cast across a window opening, and the effects are typically considered up to a maximum distance of 10 times the rotor diameter from each wind turbine. At greater distances the effects are generally considered to be negligible.

A study area of 1,620 m from each of the wind turbines has been used for this assessment. This is based upon ten times the maximum rotor diameter (162 m) that would be used within the Proposed Development in accordance with current guidelines. The assessment considers all identified potential shadow flicker sensitive receptors within the study area. For this assessment, inhabited residential buildings have been considered sensitive receptors.

The potential for shadow flicker to occur and the intensity and duration of any effects depend upon the following factors:

- The location and orientation of the window relative to the turbines;
- Whether a window has direct, unobstructed line of sight to the turbine rotor;
- The distance of the building from the turbines;
- The turbine geometry;
- The time of year (which impacts the angle of the sun's path across the sky);
- The frequency of cloudless skies (particularly at low elevations above the horizon);
and,
- The wind direction (which impacts on which direction the turbine faces).

A shadow flicker model was created using computer software. This calculates all the possible instances of shadow flicker throughout the year at all shadow flicker sensitive receptors (houses and offices) within the study area. This assumes that there are clear skies 100% of the time, all windows have unobstructed views of the turbines and that all turbines are facing the window at all times. Shadow flicker will only occur some of the time, as turbines will not always be orientated as described, clouds will obscure the sun and line of sight may be obscured by trees or other obstacles. A correction factor is then applied to the theoretical occurrence figures which considers the average % of time per year that there are clear skies. We can then calculate the likely occurrence of shadow flicker.

A shadow flicker assessment has been undertaken on up to 211 receptors within 10 rotor diameters (1,620m) of the proposed Knockanarragh Wind Farm turbines, under two study area scenarios. When considering the 'Average Theoretical Hours Per Day', (accounting for any day in which shadow flicker is predicted to occur) then shadow flicker exceeds 30 minutes at 92 receptors. When considering the 'Total Theoretical Hours Per Year', 83 receptors are predicted to exceed the WEDG 2006 threshold of more than 30 hours per year.



However, when accounting for a more 'likely' scenario, where the average annual sunshine hours are taken into account, 23 receptors are predicted to exceed more than 30 hours per year.

The results of the conservative shadow flicker assessment predict that the proposed wind farm has the potential to introduce shadow flicker impacts at some buildings surrounding the wind farm. However, the applicant is committed to implementing a zero-shadow flicker approach in line with the 2019 Draft Revised Wind Energy Development Guidelines. This will be undertaken by shutting down turbines during times when wind and climactic conditions are such that shadow flicker could occur, using the turbines inbuilt shadow flicker control module.

The implementation of the proposed mitigation measures, namely a zero-shadow flicker approach, will ensure that shadow flicker at all buildings is eliminated resulting in no impacts to receptors.

12.0 Cultural Heritage

Cultural Heritage and Archaeology refers to assets which contribute to the historic environment. The cultural heritage and archaeological assessment is completed in two parts; direct impacts upon non-designated heritage assets and direct impacts upon designated heritage asset's setting.

An assessment of potential direct and indirect impacts upon archaeological and cultural heritage assets was undertaken. The assessment was undertaken by a desk-based research approach using sources including the Meath and Westmeath Historic Environment Record data among other Government sources as well as an in-field inspection of archaeological remains within the Site and assessments of potential impacts to asset's setting. A geophysical survey was also conducted within the substation site (in proximity to the Early Medieval Ringfort **ME023-010**) to further establish archaeological potential by identifying below-ground anomalies and their spatial distribution.

Chapter 12 contains details of all regionally important heritage assets within 1km of the site, the most prominent of those being Rosmead House **NIAH: 15400921** to the south of the southern cluster of turbines.

Slightly significant adverse effects have been identified in terms of the setting to Rosmead estate and its contained designated buildings, including Rosmead House and the Triumphant Arch and to the Ballinlough estate, in particular the Ballinlough Castle (**NIAH: 15400914**), to the east of the Proposed Development. No effects were identified upon the setting of the series of ringforts and their associations.

Archaeological potential within the main wind farm site has been identified to be low, likely comprising only post-medieval assets such as field boundaries and cultivation deposits. The archaeological potential within the substation site is known to be high, with anomalies indicating potential archaeological remains detected by the geophysical survey, likely associated with the ringfort (**ME023-010**). These anomalies have been avoided where possible, and mitigation is proposed in **Chapter 12** where groundworks will be carried out near them. Mitigation has been already been undertaken by revision of design and pre-construction archaeological investigation in the substation area will be carried out where potential archaeological features have been identified.

Overall, the potential direct harm to archaeological remains of low significance associated with the ringfort within the substation site, and direct impacts to unknown archaeological remains of low significance within the wind farm site. Potential information gained and contributed to the archaeological record through archaeological works suggested (strip, map and sample) would contribute to cultural heritage data and would offset any potential effect.



13.0 Material Assets

A review was undertaken to establish the service and utilities infrastructure in the vicinity of the Proposed Development Site and the potential for the Knockanarragh Wind Farm project to impact these. The services considered include electricity, telecommunications, aviation, gas, water supply infrastructure and sewerage and waste management. As the assessment is focused on existing resources that are not addressed elsewhere in the EIAR, the impact on land resource availability is also considered.

The study area for this chapter of the EIAR relates primarily to the Proposed Development Site and those dwellings and buildings on the roads immediately surrounding it, which rely on the services that could be impacted. The provision and safeguarding of utility services is facilitated in the planning system through the County Development Plans covering the site and the information provided in the EIAR is intended to assist the planning authority in identifying the resources that need to be protected through the planning process. The assessment has been informed by consultation with service providers and desk top review of publicly available information.

The small-scale loss of commonly available agricultural land and the intention to achieve a balance between soils to be excavated at the site with materials that need to be used to fill in other parts of the Proposed Development means that the overall impact on land resources will be minimal. The commercial forestry lands that will be removed are to be removed earlier than originally intended but will be almost completely reinstated. The access tracks that are to be provided for the Proposed Development will represent an enhancement to long term forestry infrastructure. Impacts to native and ancient woodlands that are not for commercial use have been avoided through careful siting of Proposed Development features.

The location of infrastructure such as overhead and underground lines/pipes associated with electricity, gas, water and telecommunications have been identified and mitigation measures have been identified to ensure that such infrastructure will be protected during the course of the entire development. An area of undergrounding of overhead electricity lines will need to be carried out in the vicinity of T6 and T7 and this will be done in consultation with ESB Networks to ensure minimal disruption to power supply to local residents. The Proposed Development is sufficiently distant from licensed Irish Aviation Authority areas to ensure that there will not be any conflict. The IAA has nonetheless will continue to be consulted and any requirements such as navigation warning lighting will be installed as required. No conflict has been identified through consultation with telecommunications operators. The applicant for the Proposed Development will continue to engage with 2rn (RTÉ Networks) to ensure that there will be a framework in place should any interference occur. The authorised contractors to be used to dispose of construction, operation and demolition waste have been identified and arrangements for a designated Waste Manager have been identified.

14.0 Traffic

Chapter 14 considers the environmental impacts that are potentially significant where the Proposed Development is likely to result in increased traffic flows. The assessment focuses on the construction phase of the Proposed Development as the worst-case scenario for traffic generation. Potentially significant traffic related environmental effects may result from two forms of potential impact:

- the specialised transport configurations and manoeuvres required for the movement of wind turbine components transported as abnormal loads; and
- the import of general construction materials transported via 'conventional' heavy goods vehicles (HGVs) and low loaders.



14.1 Road Capacity

The study area for this assessment has been defined as the N52 and the L5542 leading to the wind farm access points. The roads included in the Turbine Delivery Route are:

- The N52 from the junction with the N4;
- The L5542 from the junction with the N52;
- The N52 north of the Proposed Development to the proposed substation location at Clonmellon; and
- Access from the L6821 to proposed substation at Clonmellon.

The majority of construction traffic will travel to the site along the routes as described above and so much of the wider network has been excluded from this assessment.

Baseline traffic flow surveys were undertaken by Tracsis who installed an automatic traffic counter (ATC) within the study area, specifically on the N52 close to Site Entrance 2 as identified in **Figure 14-4** of the EIAR.

Chapter 14 provides a summary of traffic flows, including a breakdown for HGVs, based on traffic count observations and predictions in relation to the numbers of HGV and other trips likely to be generated by the various stages of construction of the Proposed Development, which will entail the bulk of traffic generation. This has been based on estimates of the aggregate material quantities for all elements of the Proposed Development. The two on-site borrow pits and the excess from the cut and fill requirements are likely to result in all aggregate material being won within the site. However, to ensure a robust assessment / worst-case scenario, it has been assumed that the type of aggregate required for construction will be imported.

Based on these estimates of trips associated with the Proposed Development and the baseline data obtained through traffic counts, predictions have been made on the likely increased traffic flow that can be expected. It has been estimated that the Proposed Development will result in an increase of 5% to the total flow of traffic on the N52 and an increase of 27% to the number of HGVs on the N52. The calculations in **Chapter 14** estimate that the N52 will still have 80% spare capacity with the Proposed Development.

The additional traffic on the L5542 and the L6821 are likely to be proportionally higher than that assessed for the N52. However, the predicted impacts are minor in terms of community severance (road crossing) and delays. In terms of cable laying, the greatest impact is predicted at the L5542 during periods of road closure and diversion. This is expected to be a significant impact. The general amenity will also be significantly impacted on all roads while works are ongoing.

A review of the road casualties and collisions available information identified that there did not appear to be more risk in Co. Westmeath and Co. Meath than elsewhere. Given that works would occur over a relatively short construction period and traffic management measures would be in place, the predicted impact on road safety is minor.

There would be unavoidable impacts associated with the delivery of turbine components, however with ongoing community liaison and suitable public awareness and the proposed management of deliveries, the impacts will not be significant limited to the turbine delivery days.

Taking account of all the potential effects that are likely to arise and the assessment having tested the worst-case scenario expected, it is considered that the Proposed Development would not lead to a significant adverse effect due to traffic impacts. The application of mitigation measures identified in **Chapter 14** will further reduce any impacts in traffic and transportation terms. The assessment concludes that the impacts will not be significant.



15.0 Major Accidents and Disasters

A review was undertaken to establish both the vulnerability of the Proposed Development Site to major accidents and disasters (such as through flooding risk) and the potential for the Proposed Development to cause an increased risk of Major Accidents and Disasters at the site. A Health Service Executive (HSE) Major Emergency Area Plan is not available to cover the counties within which site sits, but the assessment considers the hazards under the headings used by HSE Area Plans for other areas. These Hazards include Natural (such as storms), Transportation (such as road collisions), Technological (such as industrial accidents) and Civil (such as crowd safety). A matrix approach as recommended for use by the Department of Environment, Heritage and Local Government was used to establish the type and likelihood of hazards in order to quantify the overall risk represented by them.

The assessment concluded that the project carries no significant risk of causing major accidents or disasters, nor is it vulnerable to potential disasters or accidents, including both natural and man-made incidents.

Considering the temporary nature of the construction phase, the scale of the proposed project, and the implementation of environmental protection measures from the outset, the risk of disasters (such as severe weather events) or accidents (such as fuel spills, traffic incidents, or peat slides) is deemed to be low.

In the event of severe weather conditions, such as flooding during construction, work will be halted. The project design incorporates design measures in relation to ensuring peat stability in the areas of T1 and T7. A detailed assessment is provided in **Chapter 6** of the EIAR in relation to work undertaken to ensure the long term stability of ground conditions and the mitigation measures incorporated to achieve this.

During the operational phase of the wind farm, particularly in the context of climate change, there is the potential for increased storm events and severe weather. Wind turbines are designed to withstand specific wind parameters and will automatically shut down during high wind speeds.

Therefore, the potential effects of climate change on the operational development may involve temporary shutdowns (curtailment) during severe wind conditions, but this does not pose a likely risk of major accidents or disasters. As for the construction stage, the decommissioning poses similar risks in terms of major accidents and disasters. As the decommissioning stage will again be limited to a temporary period of time, it is considered that there is a low risk of major accidents or disaster.

During construction, the CEMP specifies the Emergency Response Procedure to be followed in case of emergencies, encompassing contamination, health and safety, and environmental protection. It provides detailed information on all mitigation and monitoring measures to be implemented throughout the various phases of construction, operation, and decommissioning. The CEMP will undergo regular reviews through environmental audits and site inspections to ensure the effectiveness and implementation of all mitigation measures and commitments outlined in the application. Operational monitoring measures relating to each of the environmental issues have also been identified within each of the respective chapters and will provide early warning systems to identify any corrective actions required to reduce risks in the unlikely event that risks would be raised.

16.0 Interactions

The purpose of the Interactions chapter is to draw attention to significant interactions and interdependencies between one topic and another where they may otherwise be missed within the technical chapters of the EIAR.



A matrix is provided within the chapter to provide a visual representation of where there are potential interactions between environmental topic areas in the context of the Proposed Development. These interactions have been identified for the construction [C] operational [O] and decommissioning [D] phase. A supporting commentary is also provided, which explains the main interactions of note given the specific circumstances of the project and its location.

The review of potential interactive effects did not identify and further interactions beyond those that were identified within each of the technical assessments of the EIAR. Where any potential interactive negative impacts had been identified, appropriate mitigation measures were found to be already included in the relevant sections (Chapters 5-15) of the EIAR. The implementation of these mitigation measures will reduce or remove the potential for these effects.

17.0 Schedule of Mitigation Measures

Chapter 17 of the EIAR consolidates all the proposed mitigation measures within the proposed Knockanarragh Wind Farm Environmental Impact Assessment Report (EIAR) in one concise table and is intended to assist An Bord Pleanála in its decision-making role and in identifying any necessary planning conditions.





