Appendix 2.2

Scoping Report

Coolglass Wind Farm EIAR Volume 3

Coolglass Wind Farm Limited

SLR Project No.: 501.V00727.00006

25 May 2023

COOLGLASS WIND FARM

EIAR - SCOPING REPORT

Wind Farm in Co. Laois

Prepared for: Coolglass Wind Farm Limited

SLR Ref: 501.00727.00006
Version No:4
October 2022

BASIS OF REPORT

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Confidentiality

This document is confidential.

Revision	Prepared	Checked	Approved
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Appendix 01: List of Consultees

1.0 Introduction

This is the Scoping report for Coolglass Wind Farm, a proposed development which consists of a 13 no turbine wind farm development and associated works on land within the townlands of Fossy Upper, Aghoney, Gorreelagh, Knocklead, Scotland, Brennanshill, Monamantry, Coolglass, Crissard, Kylenabehy, County Laois. The site is approximately 731 ha in size. The development will consist of:

- 13 no. turbines, each with a height of 180m and rotor diameter of 150m and all associated site infrastructure including
- 110 kV electricity substation and switch room
- equipment compound
- turbine foundations
- 33kV collector cable circuit connecting the two clusters
- 2 no. temporary construction compounds,
- c. 15.5 kilometres of site access tracks
- underground electricity and communications cabling
- site drainage works
- 2 no. site entrances
- 1 no. Borrow Pit

This planning application seeks a 10-year construction period and a 35-year operational period.

This planning application will be accompanied by an Environmental Impact Assessment Report (EIAR) which includes an assessment of the likely significant effects of the proposed development as a whole and in combination with the relevant off-site or secondary developments which will occur as a direct result of the proposed development, including connection to the national electricity grid.

A Natura Impact Statement (NIS) will also be submitted to the planning authority with the planning application. A site location map of the proposed wind farm is presented in Figure 1-1. A layout of the proposed turbine delivery route is presented in Figure 1-2.

A grid connection will be sought as part of a separate planning process under the provisions of s. 182(A) and does not form part of this planning application.

1.1 Purpose of the Scoping Report

This Scoping Report has been prepared to identify the likely significant environmental effects of the Proposed Development which will need to be assessed in detail in the EIA and reported within the Environmental Impact Assessment Report (EIAR), which will accompany the planning application.

The proposed development is likely to be a Strategic Infrastructure Development (SID) and a pre-application consultation is underway with An Bord Pleanála (Ref: ABP-313375-22).The first stage of the EIA process is to identify the key issues and level of detail which should be addressed as part of the EIA process and to eliminate those that are not; this is termed 'scoping' and the results are presented as a scoping report.

The scoping process identifies sources or causes of potential environmental effects, the pathways by which the effects can happen, and the sensitive receptors, which are likely to be affected. It defines the appropriate level of detail for the information to be provided in the EIAR. In essence, the primary focus of scoping is to define the most appropriate approach to the assessment of significant effects related to the proposed development.

This Scoping Report sets out the views of the Applicant, as to the proposed scope of the environmental issues to be considered in the EIA and as to the method by which assessment will be undertaken and allows statutory and non-statutory consultees to comment on the proposed development, the scope of the EIA and the proposed assessment methodology. It also provides an opportunity for consultees to raise any additional issues that they consider relevant and for consideration in the EIAR. Comments of the local planning authority and other stakeholders are invited as to the method and scope of the assessment proposed to be undertaken as set out in this report.

This scoping report is part of an informal scoping exercise to ascertain what potential issues, if any, may exist in relation to the proposed wind farm and its immediate surrounds. This process is distinct from the formal scoping process which may be undertaken with An Bord Pleanála.

1.2 Structure of Report

The structure of this scoping report is as follows:

- Section 2 sets out the application site and the overall proposed development
- Section 3 sets out the structure of the EIAR.
- Section 4 sets out the scope of the EIAR by technical discipline.
- Section 5 sets out the requirement for Natura Impact Assessment and the process of Appropriate Assessment
- Section 6 sets out the requirement for Cumulative Impacts, Indirect Impacts and Interaction of Effects
- Section 7 sets out the statutory and other proposed consultees

.

1.3 Planning Process for the Proposed Development

It is intended that the proposed development will be submitted for planning directly to An Bord Pleanála pursuant to the Strategic Infrastructure Development Act 2006 (as amended), subject to a pre-application consultation process with An Bord Pleanála. Pre-application consultation with An Bord Pleanála under the Strategic Infrastructure Development will commence in Q2 2022.

Under Section 172 of the Planning and Development Act, as amended, a planning application for a development which comes within a class of development specified under Schedule 2 of Part 5 of the Planning and Development Regulations must be accompanied by an Environmental Impact Assessment Report (EIAR) in accordance with the 2014 Directive. Accordingly, as the proposed development will have more than 5 no. turbines and a generating capacity of greater than 5MW, an EIAR will be prepared for the project in accordance with the Planning and Development Regulations 2001 (as amended).

The purpose of an EIAR is to provide a detailed description of the proposed development and outline potential impacts associated with the construction, operation and decommissioning phases of the project. Where adverse impacts have been identified, mitigation measures are proposed, and the residual impacts described.

1.4 Contributors to the EIAR

This scoping report has been prepared by SLR Consulting Ireland on behalf of Coolglass Windfarm Ltd. SLR Consulting Ireland is a planning and environmental consultancy with offices in Dublin, Belfast and Cork. SLR consulting is a well-established consultancy in windfarm development in the UK and Ireland.

SLR will be designing and preparing the Environmental Impact Assessment Report for submission to An Bord Pleanála.

Specialist contributors to the EIAR include:

- Macroworks who will prepare the Landscape and Visual Impact Assessment

All other chapters will be undertaken by SLR staff. A full list of contributors will be included within the introductory chapters of the EIAR.

1.5 Consultation

The stakeholder consultation process will be carried out in accordance with the code of practice for wind energy development in Ireland – guidelines for community engagement (available at: www.dccae.gov.ie). Comments on the scope of the EIA order can be submitted by email to cleiker@slrconsulting.com by **4th November 2022.**

1.5.1 Project Website

The project website has been set up to inform the public of the project https://coolglasswindfarm.ie. The website is being used to notify members of the public of upcoming public consultation events and any changes in the design and layout as a consequence of consultations.

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02036.00787.0052.0 Site Location

N

LEGEND

Site Boundary

Proposed Turbine Layout

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COOLGLASS WIND FARM

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SITE LOCATION

FIGURE 1-1

Scale 1:50,000 @ A3

Date OCTOBER 2022

660000 680000 700000 720000

740000 720000 700000

LEGEND

Site Boundary

Proposed Turbine Delivery Route

N

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PROPOSED TURBINE DELIVERY ROUTE

FIGURE 1-2

Scale 1:250,000 @ A3

Date OCTOBER 2022

02036.00787.0053.0 Proposed Turbine Delivery Route

2.0 Application Site and the Proposed Development

2.1 Application Site

The subject site is located in County Laois near the villages of Timahoe, Wolfhill and Swan. The clusters extend over an area known as Fossy Hill and Wolfhill. The subject site is located within an upland area of central County Laois. The application site itself is elongated in shape (approximately 6km roughly north – south), within 2 no. cluster areas. The site is located approximately 1km from the village of Luggacurren and 1km from the village of Swan, both in County Laois. The area in which the optioned lands exist contains a large quantum of commercial plantation woodland. The chosen location has the potential for good energy yields resulting from the high wind levels experienced in this part of Ireland.

2.2 Proposed Development

The proposed development consists of 13 no. turbines with a tip height of 180m and a rotor diameter of 150m within a 2-no. cluster wind farm. Each proposed turbine is capable of generating 6.6 MW of power, while cumulatively the proposed wind farm will provide a total output of approximately 85.8 MW.

For the purposes of assessment, the EIAR will assess a grid connection between the proposed wind farm site and a substation near the site. The grid connection to an offsite substation has not been confirmed at the time of this report but the preferred option will be assessed as part of the EIAR. However, it is important to note that the grid connection does not form part of this application.

In addition to the turbines and grid connection, the proposed development also contains associated infrastructure such as an on-site substation, 2 no. construction compounds, internal access tracks and turbine hardstandings.

The layout of the proposed windfarm has been designed to maximise the energy yields of the wind resources passing over the site while also minimising the potential environmental effects of the wind farm. Electricity generated by the proposed windfarm will be transmitted by a series of underground cables running through the on the sides internal access tracks to the proposed on-site substation. The proposed development will also comprise improvements to the public road network for the delivery of turbine components.

The proposed turbines will be delivered via Dublin Port and this route is expected to extend following the M50 and M7 to Portlaoise whereby the proposed turbine delivery route will follow local and secondary roads to the application site.

The current design layout (Design Iteration 3) is presented in Figure 2-1.

2.2.1 Proposed On-site Substation

It is proposed to construct 1 no. on-site electrical substation compound within the proposed development as shown in Figure 2-1. This substation will provide a connection point between the proposed subject windfarm and the future proposed grid connection.

2.2.2 Grid Connection

The grid connection for the proposed development will be a 110 kV connection. The grid connection does not form part of this planning application; however, a high-level assessment of the proposed future grid connection will be carried out within the EIAR that is lodged with An Bord Pleanála.

There are two potential grid connection options which are undergoing review at this time and the preferred option will be assessed as part of the wind farm EIAR:

- Pinewoods substation, which, when constructed, will be located approximately 8 km to the west of the proposed development site.
- A second option, Coolnabacky substation, located approximately 10 km to the north of the proposed development site,

The future proposed grid connection route will follow the route of existing public and private roads between the proposed development site and the point of connection with the existing grid network. Grid connection cables will be located underground. No overhead line works will be required. The proposed grid routes are shown in Figure 2-2.

2.2.3 Turbine Delivery Route

A number of components for the proposed development will arrive into the country through Dublin Port including the blades, tower sections and the nacelles. The turbines will be assembled on site, which will be delivered to site by special transport vehicles.

The identified turbine delivery route leaves Dublin port via the M50 Motorway before connecting with the N7/M7 National Road / Motorway travelling east towards Portlaoise. From Portlaoise to proposed turbine delivery route will travel southwards via secondary roads to the application site.

The proposed turbine delivery route is shown in Figure 1-2.

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LEGEND

- Site Boundary
- Proposed Turbine Layout
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Borrow Pit

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COOLGLASS WIND FARM AND GRID CONNECTION

FIGURE 2-1

Scale	Date
1:40,000 @ A3	OCTOBER 2022

02036.00787.0054.0 Fossy Wind Farm and Grid Connection

650000 652000 654000 656000 658000

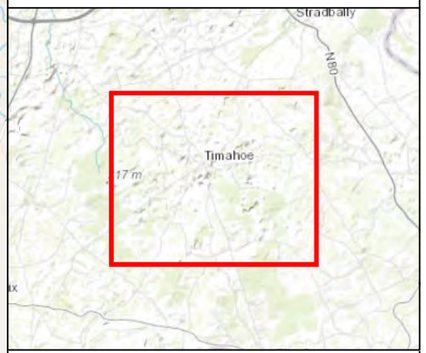
700000 698000 696000 694000 692000 690000 688000

N

LEGEND

Site Boundary

Indicative Grid Connection Route (Subject to Seperate Planning Process)



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SCOPING REPORT

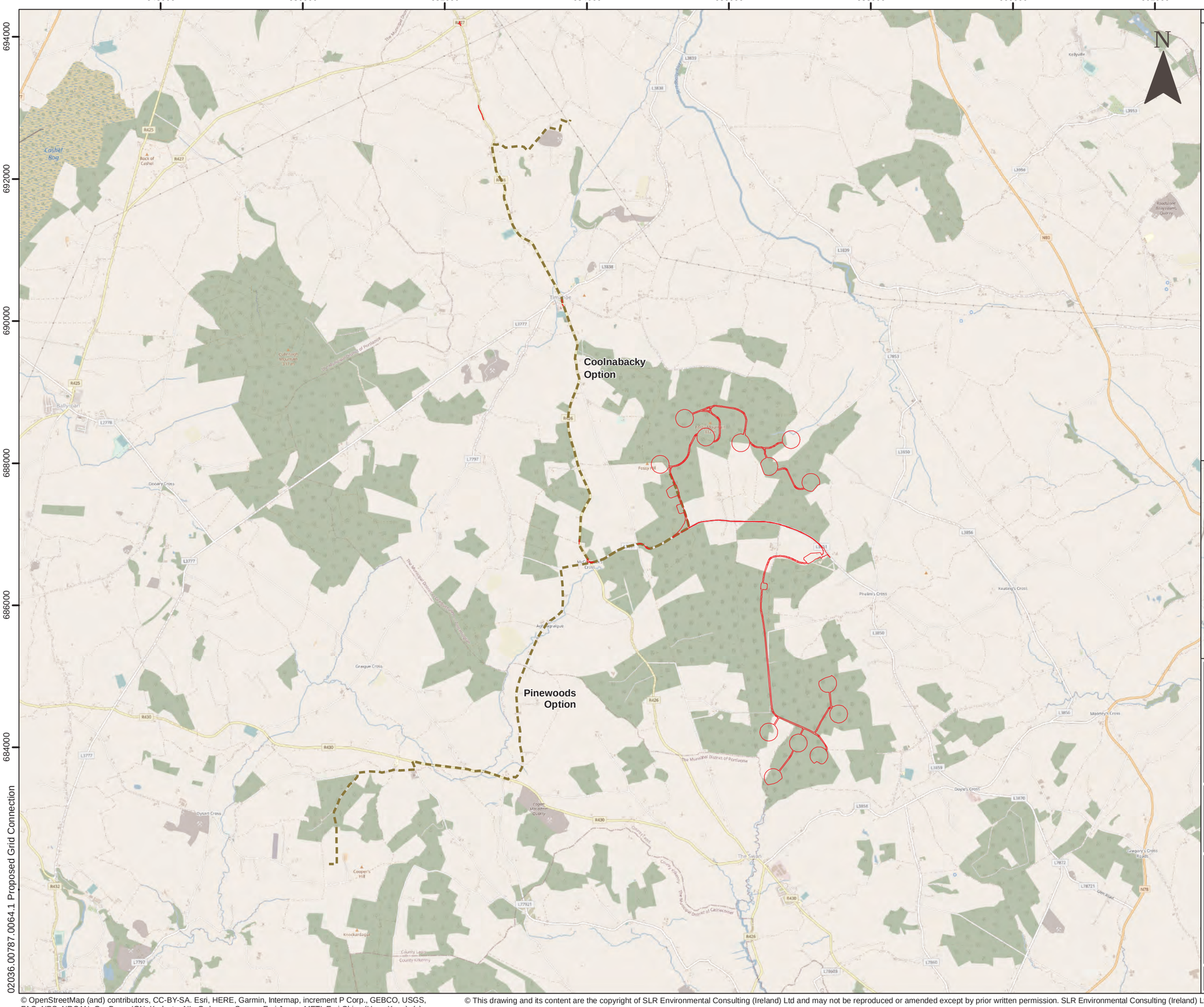
PROPOSED GRID CONNECTION (INDICATIVE)

FIGURE 1-3

Scale 1:25,000 @ A3

Date OCTOBER 2022

02036.00787.0064.0 Proposed Grid Connection



LEGEND

Site Boundary

Indicative Grid Connection Route (Subject to Seperate Planning Process)

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PROPOSED GRID CONNECTION (INDICATIVE)

FIGURE 1-3

Scale 1:50,000 @ A3

Date OCTOBER 2022

02036.00787.0064.1 Proposed Grid Connection

3.0 Statutory Requirements and Proposed Structure of the EIAR

3.1 Statutory Requirements for Strategic Infrastructure Development

The Seventh Schedule to the Planning and Development Act 2000 (as amended) identifies various classes of infrastructure development which, if considered by ABP to be Strategic Infrastructure Development, requires a planning application to be made directly to it rather than to the relevant local planning authority.

To qualify as Strategic Infrastructure Development, Section 37A(2) of the Planning and Development Act, 2000 (as amended) stipulates that a project

i. falls within the scope of one or more of the development classes identified in the Seventh Schedule and any thresholds provided therein:
ii. would satisfy one or more of the following criteria:
    a. *It is of strategic economic or social importance to the State or the region in which it would be situate;*
    b. *It would contribute substantially to the fulfilment of any of the objectives of the National Planning Framework or in any regional spatial and economic strategy in force in respect of the area or areas in which the development would be situate;*
    c. *It would have a significant effect on the area of more than one planning authority.*

The proposed development of an 85.8 MW wind farm is covered by the following class of development identified under the heading of 'Energy Infrastructure' in the Seventh Schedule of the Planning and Development Act 2000 (as amended):

Energy Infrastructure

1) Development comprising or for the purposes of any of the following (inter alia)

"an installation for the harnessing of wind power for energy production (a wind farm) with more than 25 turbines or having a total output greater than 50 MW."

In view of the proposed development having the capacity to *"produce a total output greater than 50MW",* it is considered that the proposed project exceeds the threshold laid down within the class of development identified in the Seventh Schedule.

In addition, for the reasons set out below, it is submitted that the proposed wind farm development satisfies one of the additional three criteria set out in section 37A(2) and therefore is Strategic Infrastructure Development.

3.1.1 EIA Screening

EIA is mandatory when certain classes of projects exceed specific sizes and thresholds. Planning applications for such projects must be accompanied by an Environmental Impact Assessment Report (EIAR). Assessment is mandatory for proposed wind energy developments that would equal or exceed, as the case may be the following thresholds:

- *have more than five turbines, or*
- *will have a total output greater than 5 megawatts.*

The proposed development is for a wind farm which megawatt output falls within the Seventh Schedule, which is greater than 50MW.

A judgement of the High Court in respect of *O'Grianna & Ors. v. An Bord Pleanála* ([2014] IEHC 632) determined that a wind farm and its connection to the national grid are considered a single indivisible project for the purpose of the EIA Directive. Accordingly, an EIAR which assesses both parts of a wind farm project is required to be submitted with this planning application.

3.1.2 EIA Scoping

This scoping process is an informal process which allows the developer to determine what information should be contained in the EIAR to be prepared for the Coolglass Wind Farm Project, including the content and extent of the information to be submitted to An Bord Pleanála via the submission of this scoping report to all relevant stakeholders, NGOs and Agencies who have a detailed understanding of aspects of the environment that may be affected.

3.1.3 Purpose of the EIAR

The EIAR will be prepared in accordance with the provisions contained within Schedule 6 of the Planning and Development Regulations, 2001 (as amended), which sets out the information to be contained within an EIAR. In addition, the EIAR will take account of the contents of Directive 2014/52/EU (The 2014 EIA Directive) which was adopted in April of 2014, amending the Directive 2011/92/EU (the 2011 EIA Directive) on the assessment of the effects of certain projects on the environment. The 2014 EIA Directive was transposed into Irish planning law in September 2018 via the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

The purpose of the EIAR is to protect the environment ant to inform decision making. The EIAR is structured to share key information about the environment in which the proposed development sits, and to enable effects to be foreseen and prevented during the design and consent stages. The purpose behind an EIAR is to:

- Provide relevant information to decision makers
- To anticipate, reduce and avoid significant effects,
- To assess and mitigate effects
- Ensure clarity and quality of information
- And to facilitate consultation

It is a statutory requirement for the EIAR to have particular regard to:

- The proposed project
- The receiving environment
- Likely significant effects
- Key alternatives
- Mitigation and monitoring measures
- Residual effects.

3.2 Proposed EIAR Structure

The EIAR will address the requirements of Parts 1 and 2 of Schedule 4 of the EIA Regulations. The anticipated structure and content of the EIAR is as follows:

- Chapter 1 Introduction
- Chapter 2 EIA Scoping and Key Issues
- Chapter 3 Description of The Proposed Development
- Chapter 4 Planning Policy
- Chapter 5 Population, Human Health and Material Assets
- Chapter 6 Air and Climate
- Chapter 7 Landscape and Visual
- Chapter 8 Land Soils and Geology
- Chapter 9 Water including Hydrology, Hydrogeology and Water Quality
- Chapter 10 Noise and Vibration
- Chapter 11 Cultural Heritage
- Chapter 12 Traffic and Transportation
- Chapter 13 Telecommunications and Aviation
- Chapter 14 Shadow Flicker
- Chapter 15 Biodiversity
- Chapter 16 Site Selection and Alternatives
- Chapter 17 Interactions of The Foregoing

Within each of the assessment chapters the main structure of the information presented, although not exclusively, will be as per the following headings:

- Regulatory Background
- Methodology
- Baseline Conditions (Description of the Receiving Environment)
- Impact Assessment (Description of Likely Significant Effects)
- Mitigation and Monitoring
- Residual Effects
- Cumulative and In-Combination Effects

Site selection and alternatives for the proposed project are covered in Chapter 4.

The EIAR will comprise four volumes:

- Volume 1: Non-Technical Summary
- Volume 2: EIAR
- Volume 3: Technical Appendices, as appropriate
- Volume 4: Photomontages

4.0 Scope of the Environmental Impact Assessment

Table 4-1 sets out how the various environmental topic areas as detailed within Schedule 4 of the EIA Regulations will be considered within the EIAR. No topic has been scoped out of the EIAR.

Table 4-1 Environmental Parameters

EIA Topic Area	Scoped In / Out	How / Where addressed / Reason for Scoping Out
Population / Human Health	Scoped In	To be assessed within Chapter 5 Population and Human Health
Fauna	Scoped In	To be assessed within the Chapter 15 Biodiversity
Flora	Scoped In	To be assessed within the Chapter 15 Biodiversity
Soil	Scoped In	To be assessed within Chapter 8 Land Soils and Geology
Surface Water	Scoped In	To be assessed within Chapter 9 Water
Groundwater	Scoped In	To be assessed within Chapter 9 Water
Noise	Scoped In	To be assessed within Chapter 10 Noise and Vibration
Air	Scoped In	To be assessed within Chapter 6 Air and Climate
Climate Factors	Scoped In	To be assessed within Chapter 6 Air and Climate
Material Assets	Scoped In	To be assessed within Chapter 5 Population and Human Health
Archaeological Heritage	Scoped In	To be assessed within Chapter 11 Cultural Heritage
Landscape	Scoped In	To be assessed within Chapter 7 Landscape and Visual
Traffic	Scoped In	To be assessed within Chapter 12 Traffic and Transportation
Telecommunications	Scoped In	To be assessed within Chapter 13 Telecommunications and Aviation
Aviation	Scoped In	To be assessed within Chapter 13 Telecommunications and Aviation
Shadow Flicker	Scoped In	To be assessed within Chapter 14 Shadow Flicker
Inter-relationship between above factors	Scoped In	To be assessed within Chapter 17 Interactions of The Foregoing

It is proposed that the EIAR will examine each of these topics in turn in individual chapters. The individual chapters will consider, as appropriate, the direct effects and any indirect, secondary, cumulative, short, medium, long-term, permanent and temporary, positive and negative effects of the development. The assessments will consider the significance of the effects identified with reference to the magnitude of the impact and the sensitivity of the receptor. These evaluations will be specific to each environmental discipline in the EIAR and may involve the use of recognised standards, industry guidance and professional judgement in the assessment.

Following the assessment of effects, mitigation measures to reduce and avoid any negative effects will be identified and detailed, followed by an assessment of any residual significant effects.

The following sections set out the intended scope of each of the above issues.

4.1 Introduction, Background and Context

This chapter of the EIAR will introduce the document and the Proposed Development and will set out the national and local context for the scheme. It will provide a summary of the EIA process undertaken; list the chapters within the EIAR and provide a brief description of the experts which have contributed to the technical chapters within the EIAR.

4.2 Project Description

This chapter of the EIAR will provide a detailed description of the whole proposed project, comprising information on the site, design, size and other relevant features of the project. The actual level of detail required will vary according to the specific characteristics of the Project and the environmental features likely to be affected, as may have been identified during this scoping exercise.

4.3 Site Selection and Alternatives

It is a requirement of the EIA Regulations to include " *A description of the reasonable alternatives studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects*"[1]. This chapter will include an assessment of the site alternatives studied together with an assessment of the main reasons for selecting the chosen option.

The principal alternatives studied with respect to the proposed development will be outlined under the following headings:

- **Location** – this section will discuss the overall site selection process for the proposed development on a national, regional and local scale. It will discuss the criteria used to determine site suitability for wind energy developments including
    - wind resource
    - proximity to residential dwellings
    - land zoning in County development plans
    - established in future land use
    - ecological conservation designations
    - landscape designations and
    - ease of access

[1] https://ec.europa.eu/environment/eia/pdf/EIA_guidance_Screening_final.pdf

- **Access** – details of the criteria used to select the network of access tracks that provide access from the public road network to the site and to each turbine within the sites in addition to those that provide internal connections as an alternative to using public roads between turbines will be discussed in this section. This will include information on the availability of existing track, suitable ground conditions, to rain, local road infrastructure and other considerations
- **Connection to the National Grid** – details of the criteria used to select the proposed grid connection routes will be provided. It will also include a high-level assessment of alternative grid connection route options.

4.4 Air Quality and Climate

Aspects to be assessed

An assessment of the potential effects of the Proposed Development on air quality will be included within the EIAR. The assessment will address the potential impacts on air quality arising from traffic and construction equipment during the construction phase. The potential impacts on air quality in the operational phase will also be addressed.

In terms of micro-climate, the proposed development is in a mainly rural area, corresponding to air quality Zone D, Rural Ireland, in the Air Quality Regulations (SI 180 of 2011), as amended. The air quality is expected to be good. The macro-climatic baseline is the future emission of CO_2 and other greenhouse gases, which would be produced by fossil fuel power generation in the country, in the absence of the proposed development. The potential impacts of the proposed development on microclimate and macro climate will be addressed.

4.4.1 Baseline

The location of the proposed development is within the air quality zone D within rural Ireland. The air quality is expected to be good. The proposed development site is located within an area of commercial forestry with limited access to traffic.

Dust Impacts

The assessment of dust and PM_{10} from construction activities will be carried out using a semi-qualitative methodology published by the Institute of Air Quality Management (IAQM). Where required, recommendations for mitigation measures to minimise dust and PM_{10} impacts during construction of the facility will be included in the EIAR Chapter.

4.4.2 Scope of Assessment

The assessment will address the potential impacts on air quality due to the construction equipment and activities and to emissions from traffic associated with the construction process. The potential impacts on air quality in the operational phase will also be addressed.

The climate in the immediate local area of a proposed development is known as the micro-climate whereas the climate of a large geographical area (global) is the macro-climate. The potential impacts of the proposed development on micro-climate and macro-climate will be addressed.

The air quality assessment will include:

- an assessment of emissions from the main stack and any additional ancillary stack(s) (if required);
- an assessment of emissions from road traffic accessing the Proposed Development;

- an assessment of odour from the Proposed Development;
- an assessment of dust impacts from construction activities; and
- Cumulative impact taking into account relevant neighbouring developments.

4.4.3 Assessment Methodology

Air quality monitoring conducted by the EPA at several locations in the vicinity of the site will be reviewed and levels compared with the air quality standards. To assess the impacts of construction dust emissions, the approach and assessment criteria outline in the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (NRA, 2008) will be used.

For the purposes of assessing the impact on air quality of emissions generated by construction traffic, the methodology described in the Design Manual for Roads and Bridges 2007a (UK Highways Agency, May 2007) will be used. Parameters to be assessed will include oxides of nitrogen, particulates PM_{10} and $PM_{2.5}$, carbon monoxide and benzene.

The potential micro-climatic impacts of the proposed development will be assessed in relation to the micro-climatic baseline, the scale of the elements of the project and the nature of use of the surrounding environment. For the assessment of macro-climatic effects, the emissions of carbon dioxide (CO2) and other greenhouse gases from fossil fuel power generation, which will not be required should the proposed development become operational, will be quantified and assessed in terms of Ireland's commitments under EU and international climate change treaties and protocols.

In terms of carbon losses and savings, the Scottish Windfarm Carbon Assessment Tool. will be used to estimate carbon savings because of the proposed construction and operation of the wind farm.

4.4.4 Likely Significant Effects

The assessment will address the likely potential impacts on air quality due to construction equipment and activities and to emissions from traffic associated with the construction process. The potential impacts on air quality in the operational phase will also be addressed.

The construction phase of the proposed development has the potential to generate dust emissions, which could give rise to nuisance for residents.

To assess the impacts of construction dust emissions, the approach and assessment criteria outlined in the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (National Roads Authority, 2008) will be used.

Construction plant and equipment, and the traffic generated by the construction process, have the potential to give rise to emissions of oxides of nitrogen, benzene and particulates, which could impact on local air quality. The operation of the proposed development is not expected to have a negative impact on air quality.

The proposed development is expected to have a positive impact in terms of the nett reduction in emissions of CO_2 and other greenhouse gases as a result of the proposed wind farm. For the assessment of macro-climatic effects, the reduction in emissions of CO_2 and other greenhouse gases from fossil fuel power generation when the proposed development is operational, will be quantified and assessed in terms of Ireland's commitments under EU and international climate change treaties and protocols.

4.5 Noise

An assessment of the potential effects arising from operational and construction noise impacts of the Proposed Development will be included in the EIAR.

4.5.1 Baseline

The baseline noise environment will be measured at a number of locations around the Proposed Development to inform the assessment. In line with current best practise, noise data measured at one location may be used as a proxy to be representative of other assessment locations.

Noise will be logged every ten minutes and plotted against the corresponding wind speed measured on site during the simultaneous period. Wind speed data at the height of the hub of the proposed turbines will be standardised to a 10 m value using a reference ground roughness length of 0.05m, in accordance with current best practise.

Periods of rain and extraneous noise will be excluded, and remaining data will be sorted into quiet daytime and night-time (23:00 to 07:00) periods. Quiet daytime periods are weekdays between 18:00 and 23:00, Saturdays between 13:00 and 23:00 and all day on Sundays (07:00 to 23:00), as defined in ETSU-R-97 "The Assessment and Rating of Noise from Wind Farms".

4.5.2 Scope of Assessment

4.6.3 Scope of Assessment

The assessment will address the potential impacts on noise due to the construction and operational phases of the Proposed Development.

The noise assessment will include:

- an assessment of noise generated during onsite construction activity;
- an assessment of changes in road traffic noise as a result of construction vehicles;
- an assessment of the overall operational noise level from the Proposed Development; and
- an assessment of cumulative noise impacts taking into account relevant neighbouring developments.

4.5.3 Assessment Methodology

The baseline environment will be assessed by measuring background noise levels as a function of site wind speed at the nearest neighbours, (or at a representative sample of the nearest neighbours). The exact measurement locations are to be agreed in consultation with Laois Co. Council.

The ETSU-R-97 recommendations provide a robust basis for assessing the noise implications of an operational windfarm and have become the accepted standard for such developments within the ROI. This methodology will therefore be adopted for the assessment of operational noise impact. In summary, the assessment shall:

- determine the quiet daytime and night-time criterion curves from the measured background noise levels at the nearest neighbours;
- specify the type and noise emission characteristics of the wind turbines proposed for the site;

- calculate noise emission levels due to the operation of the wind turbines as a function of site wind speed at the nearest neighbours; and
- compare the calculated wind farm noise emission levels with the derived criterion curves and assess in the light of relevant planning requirements.

At present the current guidelines against which wind turbine noise should be assessed is the 2006 Wind Energy Development Guidelines. This will form the basis for the determination of appropriate noise limits. Further consideration will be given to the Draft Revised Wind Energy Development Guidelines, 2019.

In assessing the impact of construction noise and vibration, it is usual to accept that the associated works are of a temporary nature. The principal guidance on construction noise is contained in BS5288-1:2009+A1:2014 "Code of Practice for Noise and Vibration Control on Construction and Open Sites". Likely construction noise levels will be calculated in accordance with BS5228-1 and assessed against criteria developed from this standard.

4.5.4 Likely Significant Effects

During windfarm construction, noise can arise from both on-site activities such as the construction of access tracks, turbine foundations, substation buildings etc., and from the movement of construction related traffic both on-site and travelling on public roads to and from the site.

During their operation, windfarms have the potential to generate aerodynamic noise and mechanical noise. Aerodynamic noise is caused by the interaction of the turbine blades with the air. Mechanically generated noise is caused by the operation of internal components, such as the gearbox and generator, which are housed within the nacelle of the turbine. However, the level of mechanical noise radiated from current technology wind turbines is generally engineered to a low level.

4.6 Biodiversity

An assessment of the potential effects of the Proposed Development (wind farm, indicative grid connection route and where accommodation works for the turbine delivery route are required) on biodiversity and nature conservation will be included within the EIAR.

4.6.1 Baseline

Methodology

Desk study

The following sources of information have been consulted:

- Satellite imagery[2];
- Environmental Protection Agency (EPA) maps[3];
- Design drawings and the project description of the Proposed Development;

[2] https://www.google.ie/maps?msclkid=e320bf09ac4b11ec962eba37559e014d Accessed 16/06/2022.
[3] https://gis.epa.ie/EPAMaps/?msclkid=f47d1958ac4b11ec8e8b9eed262285b1 Accessed 16/06/2022.

- National Parks and Wildlife Service (NPWS) and the National Biodiversity Centre (NBDC) online resources[4];
- NBDC protected flora and fauna;
- Environmental Sensitivity Mapper[5];
- BirdWatch Ireland website[6]; and
- Results from previous surveys carried out between 2012 – 2018 (four years of winter and summer bird surveys from 2012-2018, habitat surveys carried out in 2013 and 2016 and one year of bat surveys carried out in 2017).

Field survey

The following surveys are currently in process:

- **Birds:** Vantage Point (VP), breeding raptor and feeding distribution surveys. Survey methodology and study area in accordance with latest NatureScot (formerly SNH, 2017)[7] guidance. This will provide the required two years of bird survey data collected in the last five years;
- **Bats:** static detector, survey at height, transects and roost surveys (winter and summer) within the Proposed Development boundary and within 200 m plus rotor radius of the turbine locations. Survey methodology and study area in accordance with latest NatureScot (SNH, 2021)[8] and Collins (2016)[9] guidance. Roost surveys will be undertaken along the indicative grid connection route and where accommodation works are required along the turbine delivery route. This will have occurred within the last two years in accordance with NatureScot (2021) requirements; and
- **Mammals other than bats**: terrestrial walkover and camera trap surveys within the Proposed Development. Survey methodology in accordance with Creswell et al. (2012)[10] guidance. Surveys focused on areas within 50 m of any proposed infrastructure.

Surveys due to be completed include:

- **Habitats:** Terrestrial habitat surveys will occur (i) within the Proposed Development, (ii) within 500 m of the future grid connection route, and (iii) where accommodation works are required along the turbine delivery route. Aquatic habitat surveys will occur in the same areas, although these will extend to 150 m either side of where any proposed infrastructure or works crosses a water course, as well as some sites

[4] https://maps.biodiversityireland.ie/Map?msclkid=0dfc1fd9ac4c11eca42c759f25d724b0 Accessed 16/06/2022. Only records of protected species from the past 10 year are considered as older records are unlikely to still be relevant given their age and the changes in land management likely to have occurred in the intervening period.

[5] https://airomaps.geohive.ie/ESM/ Accessed 16/06/2022.

[6] https://birdwatchireland.ie/?msclkid=784fe2d6ac4d11ecb74d5d58624ca087 Accessed 16/06/2022.

[7] https://www.nature.scot/sites/default/files/2018-06/Guidance%20Note%20-%20Recommended%20bird%20survey%20methods%20to%20inform%20impact%20assessment%20of%20onshore%20windfarms.pdf Accessed 16/06/2022.

[8] https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation?msclkid=33793f88ac5b11eca9a46a091ef728d9 Accessed 16/06/2022.

[9] https://www.bats.org.uk/resources/guidance-for-professionals/bat-surveys-for-professional-ecologists-good-practice-guidelines-3rd-edition?msclkid=7aa611e8ac5b11ecb7f21bca3e4a0d43 Accessed 16/06/2022.

[10] Cresswell, W.J., Birks, J.D.S., Dean, M., Pacheco, M., Trewhella, W.J., Wells, D. and Wray, S. (2012). UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. The Mammal Society, Southampton.

downstream but within the wider catchment. Habitats will be mapped according to Fossitt (2000)[11] and following best-practice guidance outlined in Smith et al. (2011)[12]. Any habitats listed under Annex I of the EU Habitats Directives will be recorded in accordance with the EC's 'Interpretation Manual of European Union Habitats' (2013)[13], and their quality assessed against the criteria listed in NPWS manuals (where available) and using Biodiversity Ireland's ERICA tool[14];

- **Botanical:** Protected (listed on flora Protection Order) and invasive (including those listed as Third Schedule species under Regulations 49 and 50 of the Birds and Natural Habitats Regulations 2011; and any non-native species) species will be recorded as part of the terrestrial and aquatic habitat surveys and their locations mapped;
- **Invertebrates:** Any rare or threatened species of terrestrial invertebrates will be recorded if detected during other surveys. Aquatic macro-invertebrate, white-clawed crayfish *Austropotamobius pallipes* (including eDNA), stage 1 & 2 and eDNA pearl mussel *Margaritifera spp* surveys are planned for waterbodies within and downstream of the Proposed Development;
- **Amphibians:** Environmental DNA (eDNA) sampling of any waterbodies within and downstream of the Proposed Development will be used to record amphibian (e.g. smooth newt *Lissotriton vulgaris* or common frog *Rana temporaria*) presence and amphibian species will be recorded if detected during other surveys;
- **Common lizard:** The habitats will be assessed for their potential to support common lizard and this species will be recorded if detected during other surveys;
- **Otter**: otter surveys will be carried out for all watercourses within the Proposed Development and 150 m up/downstream of any watercourses crossed by the indicative grid connection; and
- **Fish:** Electrofishing (under a DECC licence) and biological water quality (Q-sampling) surveys will occur at 26 sites within and upstream and downstream of the Proposed Development.

In general, a catchment-wide approach will be undertaken to ensure that any connectivity between the Proposed Development and in- and ex-situ populations of mobile qualifying interest (QI) species of any nearby Special Areas for Conservation (SACs) or Special Protection Areas (SPAs) is identified.

Preliminary results

Designated sites

Internationally and nationally designated sites are discussed for the proposed development site below. Note, for brevity, that distances (both direct-line and instream) are presented for the main wind farm itself, recognising the fact that the indicative underground grid connection crosses many of the watercourses (e.g. tributaries of the Stradbally [Laois]) found within the northern turbine cluster. The indicative grid connection route is also only a short distance away from the northern turbine cluster, with the same hydrological (surface water) and hydrogeological (ground water) connections present.

[11] https://www.npws.ie/sites/default/files/publications/pdf/A%20Guide%20to%20Habitats%20in%20Ireland%20-%20Fossitt.pdf?msclkid=c28fe35dac5b11ec9ae3df85ef7e3838 Accessed 16/06/2022.

[12] https://www.heritagecouncil.ie/content/files/best_practice_guidance_habitat_survey_mapping_onscreen_version_2011_8mb.pdf?msclkid=18a5c344ac5c11ecbfaf4ad7c1db452d Accessed 16/06/2022.

[13] https://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/Int_Manual_EU28.pdf?msclkid=34f9469eac5c11ec9d757a8371dc5bd2 Accessed 16/06/2022.

[14] https://biodiversityireland.ie/projects/ivc-classification-explorer/?msclkid=e60a1699ac6011ecb2f2989ff162b89b Accessed 16/06/2022.

Internationally designated sites (Natura 2000)

The Proposed Development is not situated within any Natura 2000 site. There are three SACs within 15 km and two SPAs within 20 km[15] of the Proposed Development; no other SACs or SPAs than those mentioned have downstream hydro- or hydrogeological connectivity or ecological connectivity to the Proposed Development. There are no Ramsar sites within 20 km of the Proposed Development.

The SACs and SPAs are listed in Table 4-2 below with information presented on their QIs, distance to the Proposed Development and whether there is a potential ecological, hydrological or hydrogeological connection to the same.

[15] A 20 km search distance has been used for SPAs as a starting point, as the largest core foraging range (CFR) for any Irish bird species listed in the NatureScot (2016) document 'Assessing Connectivity with Special Protection Areas' is 20 km.

Table 4-2 SACs within 15 km and SPAs within 20 km

Site	Site Code	Qualifying Interest(s)	Direct-line Distance to Proposed Development (km)	Potential Hydrological / Hydrogeological / Ecological Connection (Y/N)
River Barrow and River Nore SAC	002162	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Reefs [1170] *Salicornia* and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] European dry heaths [4030] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] Petrifying springs with tufa formation (*Cratoneurion*) [7220] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Vertigo moulinsiana* (Desmoulin's Whorl Snail) [1016] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Austropotamobius pallipes* (White-clawed Crayfish) [1092] *Petromyzon marinus* (Sea Lamprey) [1095]	3.2	**Y. Hydrological connection via the Owveg[Nore] - 5.7 km instream distance.** **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Barrow_SC_050 and Nore_SC_060) and southern turbine cluster (Dinin [North]_SC_010).** **Y. The following QIs are mobile so there is a potential ecological connection: sea lamprey, brook lamprey, river lamprey, twaite shad, salmon and otter.** **There are also further connections between mobile and non-mobile QIs e.g. as salmonids act as hosts during part of the pearl mussel lifecycle.**

Site	Site Code	Qualifying Interest(s)	Direct-line Distance to Proposed Development (km)	Potential Hydrological / Hydrogeological / Ecological Connection (Y/N)
		Lampetra planeri (Brook Lamprey) [1096] *Lampetra fluviatilis* (River Lamprey) [1099] *Alosa fallax fallax* (Twaite Shad) [1103] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Trichomanes speciosum* (Killarney Fern) [1421] *Margaritifera durrovensis* (Nore Pearl Mussel) [1990]		
Ballyprior Grassland SAC	002256	Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]	3.5	N. No hydrological connection. **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Barrow_SC_050).** N. QIs are not mobile so no ecological connection.
Lisbigney Bog SAC	0000869	Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210] *Vertigo moulinsiana* (Desmoulin's Whorl Snail) [1016]	11.8	N. No hydrological connection. **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Nore_SC_060).** N. QIs are not mobile so no ecological connection.
River Nore SPA	004233	Kingfisher (*Alcedo atthis*) [A229] (resident population)	11.5	**Y. 16.8 km instream distance via the Owveg [Nore].** **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Nore_SC_060).**

Site	Site Code	Qualifying Interest(s)	Direct-line Distance to Proposed Development (km)	Potential Hydrological / Hydrogeological / Ecological Connection (Y/N)
				N. Kingfishers are riparian birds and tend not to venture far from rivers. They are also highly territorial and maintain ranges covering at least 1 km of a river but may extend up to 5 km[16]. No kingfishers have been recorded during surveys.
Slieve Bloom Mountains SPA	004160	Hen harrier (*Circus cyaneus*) [A082] (resident population)	19.0	N. No hydrological connection. N. No hydrogeological connect as SPA within separate sub-catchment. N. Hen harriers have a maximum foraging distance of 10 km during the breeding season. No harriers have been recorded on site during the breeding season and the habitats are not suitable for breeding harriers either. No winter roosts have been recorded during bird surveys, so no effects on the winter population are possible.

[16] https://www.rspb.org.uk/birds-and-wildlife/wildlife Access 16/06/2022.

Nationally designated sites

The Proposed Development is not situated within any nationally designated site. There is one NHA and 15 pNHAs within 15 km of the proposed development site; no other NHAs or pNHAs have downstream hydrological or hydrogeological connectivity, or ecological connectivity to the Proposed Development.

The NHAs and pNHAs are listed in Table 4-3 with information presented on their QIs, distance to the Proposed Development and whether there is a potential ecological, hydrological or hydrogeological connection to the same.

Table 4-3 NHAs and pNHAs within 15 km

Site	Site Code	Qualifying Interest(s)	Direct-line Distance to Proposed Development (km)	Potential Hydrological / Hydrogeological / Ecological Connection (Y/N)
Timahoe Esker pNHA	000421	Eskers and broadleaved woodland.	1.8	**Y. Hydrological connection via Stradbally [Laois] – 3.8 km instream distance.** **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Barrow_SC_050).** N. No ecological connection as QI habitats non-mobile.
Clopook Wood pNHA	000860	Ash and hazel *Corylus avellana* woodland, calcicole flora, rich lichen and bryophyte communities and badger setts.	2.3	N. No hydrological connection. **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Barrow_SC_050).** **Y. QI habitats non-mobile but badgers from nearby pNHA could use habitats at Proposed Development.**
Stradbally Hill pNHA	001800	Mature oak *Quercus spp* and hazel woodland.	5.5	N. No hydrological connection. **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Barrow_SC_050).** N. No ecological connection as QI habitats non-mobile.
Ridge of Portlaoise pNHA	000876	Eskers, woodlands, nettle leaved-bellflower *Campanula trachelium* (Flora Protection Order) and blue fleabane *Erigeron acer* (Red-list).	8.6	N. No hydrological connection. N. No hydrogeological connection as within separate sub-catchment. N. No ecological connection as QI habitats and plants non-mobile.
Dunamase Woods pNHA	001494	Oak and beech woodlands.	8.7	N. No hydrological connection. N. No hydrogeological connection as within separate sub-catchment.

Site	Site Code	Qualifying Interest(s)	Direct-line Distance to Proposed Development (km)	Potential Hydrological / Hydrogeological / Ecological Connection (Y/N)
				N. No ecological connection as habitats non-mobile.
Rock of Dunamase pNHA	000878	Meadow grassland, shallow limestone soil, pasture and hazel scrub.	8.7	N. No hydrological connection. **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Barrow_SC_050).** N. No ecological connection as QI habitats and plants non-mobile.
Kilteale Hill pNHA	000867	Hazel woodland.	8.7	N. No hydrological connection. **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Barrow_SC_050).** N. No ecological connection as habitats non-mobile.
Ballylynan pNHA	000857	Meadows.	9.1	N. No hydrological connection. **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Barrow_SC_050).** N. No ecological connection as habitats non-mobile.
Grand Canal pNHA	002104	Diversity of habitats (hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland), otter, smooth newt, opposite-leaved pondweed *Groenlandia densa* (Flora Protection Order)	10.2	**Y. Hydrological connection via Stradbally [Laois] – 14.7 km instream distance.** **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Barrow_SC_050).** **Y. QI otter could travel upstream to the Proposed Development, providing an ecological connection.**
Croan Bogs NHA	002383	Peatlands [4]	10.7	N. No hydrological connection.

Site	Site Code	Qualifying Interest(s)	Direct-line Distance to Proposed Development (km)	Potential Hydrological / Hydrogeological / Ecological Connection (Y/N)
				Y. Hydrogeological connection as partly within same WFD sub-catchment as southern turbine cluster (Dinin [North]_SC_010). N. Peatland habitats are not mobile, so no ecological connection.
The Great Heath of Portaloise pNHA	000881	Lowland acidic grassland, few-flowered spike rush *Eleocharis quinquerflora* and fen bedstraw *Galium uliginosum*.	11.7	N. No hydrological connection. **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Barrow_SC_050).** N. QI habitats and plants are not mobile so no ecological connection.
Lisbigney Bog pNHA	000869	Overlaps with SAC of same name.	11.7	N. No hydrological connection. **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Nore_SC_060).** N. QIs are not mobile so no ecological connection.
Barrow Valley At Tankardstown Bridge pNHA	000858	No site synopsis available.	12.3	**Y. 28.3 km instream distance via the Stradbally [Laois].** N. No hydrogeological connection as within separate sub-catchment. **Y. No site synopsis available, so assumed there is an ecological connection between the pNHA and Proposed Development as worst-case scenario.**
River Nore/Abbeyleix Woods Complex pNHA	002076	No site synopsis available.	13.0	**Y. 28.3 km instream distance via the Owveg [Nore].** **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Nore_SC_060).** **Y. No site synopsis available, so assumed there is an ecological connection between the pNHA and Proposed Development as worst-case scenario.**

Site	Site Code	Qualifying Interest(s)	Direct-line Distance to Proposed Development (km)	Potential Hydrological / Hydrogeological / Ecological Connection (Y/N)
Shanahoe Marsh pNHA	001923	No site synopsis available.	13.3	N. No hydrological connection. N. No hydrogeological connection as within separate sub-catchment. **Y. No site synopsis available, so assumed there is an ecological connection between the pNHA and Proposed Development as worst-case scenario.**
Derries Wood pNHA	000416	Diversity of habitats (mature beech, lake, fens, gravel pits and bogs), sika deer *Cervus nippon*, pine marten *Martes martes*, mute swan *Cygnus olor* and duck species.	14.4	N. No hydrological connection. **Y. Hydrogeological connection as partly within same WFD sub-catchment as northern turbine cluster (Barrow_SC_050).** N. QI habitats are not mobile so no ecological connection; sika deer and pine marten at the Proposed Development unlikely to be from pNHA owing to intervening distance and no waterbodies at the Proposed Development suitable for swans and ducks.

Habitats

Preliminary findings suggest the proposed development site mainly consists of conifer plantation (WD4) and improved agricultural grassland (GA1), with patches of other lower value habitats including Scrub (WS1) as well as treelines (WL2) and hedgerows (WL1). No Annex 1 habitats have been previously mapped and are unlikely to be present (e.g. there is no evidence that forestry has been planted over peat habitats). No ancient woodlands have been mapped at the proposed development site. Small areas of broadleaved woodlands are present; however, these typically comprise of non-native species such as beech.

The indicative grid connection route will be located almost entirely within the existing road network with only a small area traversing improved agricultural grassland and hedgerows.

Aquatic habitats within the Proposed Development are likely to comprise drainage ditches (FW4) and upland/eroding watercourses (FW1). Downstream there are likely to be a wider variety of habitats, potentially including Annex 1 riparian habitats but this will be confirmed by upcoming surveys.

Species

Plants

No rare or protected plant species were recorded by surveys to date or are contained within the NPWS database for locations within 2 km from the Proposed Development.

Invertebrates

No rare or protected terrestrial invertebrates have been recorded by surveys to date. A 2019 record of marsh fritillary *Euphydryas aurinia* butterfly is contained within the NPWS database for locations within 2 km from the Proposed Development; however, this is likely to be outside of the Proposed Development, as no suitable peatland habitats are present inside.

Parts of the Nore Upper catchment that cross the Proposed Development are listed as containing SAC populations of Nore pearl mussel *Margaritifera durrovensis*, with other parts listed as containing catchments of other extant populations. White-clawed crayfish have been historically recorded within the catchment.

Amphibians

Common frog been recorded breeding within the proposed development site by recent surveys. No smooth newts have been recorded during surveys to date, but the aquatic surveys will confirm presence definitively.

Reptiles

No common lizard *Zootoca vivpara* has been recorded by surveys to date with no recent records held by NPWS within the wider area. Conifer plantation and improved agricultural grassland habitats may offer some suitable for common lizard; however, these habitats are generally of low suitability for this species.

Birds

BirdWatch Ireland sensitivity mapping has not been undertaken for the entire proposed development site but areas where it has been completed show the area to be of 'low sensitivity' for birds.

Vantage point surveys have so far recorded the following target species likely to be susceptible to wind farm impacts: European golden plover *Pluvialis apricaria*, kestrel *Falco tinnunculus*, peregrine falcon *Falco peregrinus* and northern lapwing *Vanellus vanellus*. Of these, most were only recorded a handful of times and generally in low numbers, suggesting that collision risk is likely to be low.

Breeding raptors confirmed as maintaining territories (or suspected nests) within or nearby to the Proposed Development include buzzard *Buteo buteo* and sparrowhawk *Accipiter nisus* (both Birds of Conservation Concern in Ireland or 'BoCCI'[17] green-listed). Nearby quarries (closest 3 km) provide breeding habitats for peregrine (four occupied nest sites were recorded within 5 km of the Proposed Development during the last National Peregrine Survey in 2017), although these are at sufficient remove that disturbance is unlikely. Kestrel may breed near to the Proposed Development but this has only been suspected and has not been confirmed by surveys to date.

Habitats within the proposed development site are largely unsuitable for breeding waders, although woodcock *Scolopax rusticola* have been recorded maintaining breeding territories within the conifer plantation.

Feeding distribution surveys recorded no swans or geese within 500 m of the proposed development site.

Bats

Previous survey results from 2016 recorded no roosts within the proposed development site, with pockets of activity from common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus*. Leisler's bat *Nyactulus leisleri* was also recorded but much less frequently. While the most recent bat survey results have not yet been analysed, it is likely a similar suite of species will be recorded again.

Mammals other than bats

Terrestrial surveys to date have recorded badger *Meles meles* setts/latrines, red squirrel *Sciurus vulgaris* signs, Irish hare *Lepus timidus* sightings, pine marten signs / roadkill and deer signs (sika and fallow *Dama dama*). It is likely that hedgehogs *Erinaceus europaeus* use some of the woodland habitats (especially broadleaved) within the Proposed Development, although no recent records exist within the general area. Red fox *Vulpes vulpes* are also likely to use the habitats within the Proposed Development and a record from 2018 is in the NPWS database.

Previous surveys between 2012-2018 have recorded signs of otter *Lutra lutra*; however, this finding will be updated by the latest aquatic surveys due to be completed.

Invasive species

Japanese knotweed *Fallopia japonica,* cherry laurel *Prunus laurocerasus* and Himalayan honeysuckle *Leycesteria formosa* have been recorded near to the Proposed Development by current surveys, although a full botanical survey is still to be undertaken. A dead invasive greater white-toothed shrew *Crocidura russula* was also recorded within the Proposed Development during recent mammal surveys.

Any invasive aquatic plants found during the upcoming surveys will be recorded.

Fish

Fish surveys are still to be completed; however, sea lamprey, brook lamprey, river lamprey, twaite shad, salmon are known to occur downstream in the River Nore

Ecological Networks

Most of the land within the southern turbine cluster is not likely to contribute towards an ecological network (as defined by NPWS, 2016[17]). The land within the northern turbine cluster is assessed as likely contributing towards part of one ecological network, with a small area potentially contributing to two networks.

[17] https://birdwatchireland.ie/app/uploads/2021/04/BOCCI-2020-2026.pdf?msclkid=9b739406ae7311ec8014e98fa6f78114 Download 16/06/2022

4.6.2 Scope of Assessment

For the EIAR, an assessment will examine the likely significant effects (both unmitigated and mitigated) of the main wind farm site itself, the indicative grid connection and where any accommodation works for the turbine delivery route are required. This will be for all biodiversity receptors (designated sites, habitats and species) within the Zone of Influence or otherwise connected ecologically or hydrologically with the Proposed Development.

In addition to the Biodiversity Chapter of the EIAR, an AA Screening and Natura Impact Statement (NIS) will be produced to examine the effects of the Proposed Development on Natura 2000 sites.

4.6.3 Assessment Methodology

Assessment will be primarily based upon the guidelines for ecological impact assessment produced by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) and Environmental Protection Agency (EPA, 2022), as well as other relevant guidance specific to certain taxonomic groups e.g. NatureScot (2017) for birds and NatureScot (2021) for bats.

Baseline reports detailing the results of bird surveys, bat surveys and aquatic surveys will be used to inform the EIAR and will be included as Appendices. A collision risk model and report will also be included as an Appendix to provide a quantitative estimate of collision risk to bird species.

Mitigation measures will be recommended to reduce the effect of the potential impacts, with an assessment made of the residual impact of the Proposed Development to each biodiversity receptor.

Appropriate Assessment

Methodology will follow NPWS (2010) and EC (2021, 2018) guidance on the application of the Habitats Directive. The 2021 EC guidance describes a series of stages and steps which should be completed when carrying out the assessment and these will be followed. The assessment applies only to Natura 2000 sites (Special Protection Areas and Special Areas of Conservation). More specifically, it only applies to the qualifying interest features of such sites i.e. the features which are the reason that the site was designated. Both in-situ and ex-situ effects will be considered, along with in-combination effects from other projects and plans. Mitigation measures will only be considered in the NIS and not in the AA screening.

4.6.4 Likely Significant Effects

Likely significant effects are shown for each stage of the proposed development and biodiversity receptor below.

Construction stage

Designated Sites

No direct loss of habitats will occur as the Proposed Development is located outside any designated site.

The most likely potential impacts include the release of suspended solids and pollutants, which may enter watercourses. These then have the potential to be transported downstream, negatively affecting either aquatic QI habitats or species within designated sites themselves, or outside the designated sites where mobile QI species are present. Designated sites most likely affected by such impacts include: the River Barrow and River Nore SAC, the River Nore SPA and the Grand Canal pNHA.

Disturbance to mobile aquatic QI species may also occur where there is downstream connectivity to the project. The designated sites most likely to be affected by this include: the River Barrow and River Nore SAC and the Grand Canal pNHA.

Other potential impacts include the spread of any invasive species located within the footprint of the Proposed Development, which may be spread via construction activities either directly or indirectly via watercourses to designated sites. These invasive species could undermine the conservation objectives for said designated sites. Of particular risk will be the spread of invasive species along the indicative grid connection route within the existing road network.

While some designated sites are hydro-geologically connected to the Proposed Development, none are designated for freshwater habitats such as turloughs that are susceptible to groundwater pollution and so this impact is not likely to occur.

Habitats

Permanent and temporary loss to habitats will occur during construction (infrastructure felling), although this is likely to be mainly for lower-value habitats such as a commercial conifer plantation. It is likely that approximately 10.5 ha of commercial forestry will be lost during the construction stage (mostly Sitka spruce conifer plantation) and under the 2014 Forestry Act, the planting of alternative land(s) is stipulated, although this is for infrastructure felling (e.g. where trees are felled to make way for infrastructure associated with the Proposed Development such as turbine bases) and turbulence felling (e.g. where trees are felled to improve the operational efficiency of turbines) only. No terrestrial Annex 1 habitats are likely to be lost.

Where possible, there is opportunity to replace felled conifer plantation with habitats that will have a more positive effect on biodiversity.

As for designated sites, riparian and other aquatic habitats could be impacted by the release of suspended solids and pollution.

Species

Potential impacts during construction include habitat loss and gain, which could affect flora, bats, mammals other than bats, birds, amphibians, reptiles and invertebrates. This includes habitats used for breeding, foraging and resting. Woodland specialists may lose such habitats, but other species that prefer open habitats may find the Proposed Development site more favourable to them. The net effect on species could be neutral, positive or negative depending on the quality of the open habitats created vs. those woodland habitats lost.

Other impacts could include disturbance or displacement by construction works, especially for any of the previously mentioned taxonomic groups during sensitive stages of their life-cycle e.g. breeding.

As mentioned for designated sites above, pollution and suspended solids could enter watercourses, which could negatively impact aquatic species.

Operational stage

Designated Sites

The most likely operational impact is collision with turbines for mobile QI bird or bat species (as the indicative grid connection will be underground no collision risk is possible for this component of the Proposed Development). Other sources of impacts for birds includes barrier effects where turbines may cause the birds to alter their flight paths, thereby expending greater energy. Disturbance and displacement caused by operational turbines is also a potential impact to birds and potentially bats.

Bats may also suffer barotrauma caused by the changes in air pressure surrounding operational turbines.

Given the lack of ecological connection between the Proposed Development (see Section 4.7.2) and any designated site for birds or bats, no impacts are likely.

Habitats

Impacts to habitats during operation are unlikely as there will be no land-take (apart from the maintenance of bat buffers surrounding turbines e.g. areas that are kept free of habitat features such as treelines that can attract bats, thereby reducing the risk of collision with operational turbines) and there is a very low risk that any suspended solids or pollutants will enter watercourses, which could reduce effective habitat area or quality.

Species

The main potential impact during operation is collision with moving turbines for birds and bats (as outlined above). Other taxonomic groups are less likely to be impacted during operation as disturbance is much less likely owing to reduced human presence.

Decommissioning stage

Designated Sites, Habitats and Species

Impacts from decommissioning are likely to be similar as for the construction stage, except they are likely to be lower in magnitude.

4.7 Land, Soils and Geology

Soil is defined as the top layer of the earth's crust and is formed by mineral particles, organic matter, water, air and living organisms. Soil is an extremely complex, variable and living medium and its characteristics are a function of parent subsoil or bedrock materials, climate, relief and the actions of living organisms over time.

Soil formation is an extremely slow process and can take thousands of years to evolve; soil can be considered essentially as a non-renewable resource.

As the interface between the earth, the air and the water, soil performs many vital functions; it supports food and other biomass production (forestry, biofuels etc.) by providing anchorage for vegetation and storing water and nutrients long enough for plants to absorb them. Soil also stores, filters, and transforms other substances, including carbon and nitrogen, and has a role in supporting habitats that serve as a platform for human activity.

4.7.1 Baseline

Soils

The Irish Soils Information System mapping project, undertaken by Teagasc, provides a modern classification of Irish soils, in line with international standards.

The dominant soil association in the area is the Crosstown Soil Association (1030a). It is described by Teagasc as a 'fine loamy drift with siliceous stones'[18]. More specifically, the Crosstown Association consists primarily of Luvisols 'with surface-water gleys, stagnic brown earths and in lower lying or flat areas with some groundwater gleys'. luvisols are common in hill landscapes and are characterised by having a high clay content at depth. This

[18] Creamer, R., & O'Sullivan, L. (Eds.). (2018). The soils of Ireland. Springer.

results in good nutrient retention, but has a negative affect on drainage, which tends to be moderate to poor[19] .

The Crosstown Soil Association is extensive across the Castlecomer Plateau; the proposed development is at the northern end of its extent. Twelve of the proposed locations are underlain by the association.

The Ashgrove Soil Association (1160a) is also well-developed in the area and underlies one proposed location. It is also described by Teagasc as 'fine loamy drift with siliceous stones'. The Ashgrove soil association consists of humic brown earths[19] , which are generally considered to good agricultural soils, although sometimes prone to drought. It is moderately acidic.

The Ashgrove Soil Association has a limited range across the country, with three occurrences in Co. Laois and the remainder in counties Clare and Limerick.

Two other soil associations occur in close proximity to the proposed development. River alluvium (05RIV) occurs to the west of southern cluster of proposed locations. It is poorly draining and has a weak soil structure [19] . As an association, it is widespread throughout the country. The Ballinamore Soil Association (0760e) occurs to the northeast of the northern cluster and is described by Teagasc as a 'fine loamy drift with limestones'. It consists of surface-water gleys and is poorly drained[19].

Superficial Deposits

There are two types of superficial deposits at the proposed site: Till derived from Namurian shales & sandstones; and bedrock at or close to surface[19]. Till derived from Namurian shales and sandstones is extensive throughout the country. The occurrences at the site are part of a larger swathe of this superficial deposits, which extends from south Co. Tipperary through Co. Kilkenny and into Co. Laois. Seven of the proposed locations are underlain by this type of till. There are extensive occurrences of Till derived from Namurian shales & sandstones in the mid-west, northwest and east of the country.

Six of the proposed sites are not underlain by subsoil, but by bedrock, which is close to surface, indicating that the overlying soils are relatively thin. Bedrock outcrop is mapped within these areas of shallow bedrock[20].

Bedrock

The proposed site is on the northern limb of the upraised outlier which forms the Castlecomer Plateau. The outlier is often referred to as the Leinster Coalfield, due to the coal seams which were mined until the late 20th century. The sequence is of Namurian age, the lowest part of the Upper Carboniferous. A generalised stratigraphy of the area is presented in Table 4-2. Younging is to the south.

Table 4-4 Summary Stratigraphy

Unit Name	Description
Coolbaun Formation	Shale and sandstone with thin coals
Clay Gall Sandstone Formation	Feldspathic quartzitic sandstone
Moyadd Coal Formation	Shale, siltstone and minor sandstone, with thin coals

[19] Teagasc: www.teagasc.ie
[20] Geological Survey of Ireland: www.gsi.ie

Bregaun Flagstone Formation	Thick, flaggy sandstone and siltstone
Killeshin Siltsone Formation	Muddy siltstone and silty mudstone
Luggacurren Shale Formation	Mudstone and shale with chert and limestone

Mapping by the Geological Survey of Ireland[20] indicates that three of the proposed locations are underlain by the Killeshin Siltstone; four by the Bregaun Sandstone; one by the Moyadd Coal; two by the Clay Gall Sandstone; and three by the Coolbaun Formation.

There are known historic coal mines in the area. A desktop mapping exercise has determined that none of the proposed locations is located close to or on a former coal mine. The closest mapped historic mine is c. 230m from location four.

4.7.2 Scope of Assessment

The assessment will address soils, superficial deposits and bedrock underlying the wind farm. Geological Heritage has also been considered. None of the County Geological Sites in the location have the potential to be affected by the proposed development and will therefore not be assessed.

4.7.3 Assessment Methodology

The methodology for the soils and geology assessment will be in accordance with the guidelines published by the Institute of Geologists of Ireland in 2013, 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'.

At this stage, it is envisaged that the Preliminary Site Investigation (Phase 1) will consist of geophysical surveys at turbine locations in order to provide a preliminary assessment of rockhead levels at each site, peat probing along access road routes to identify whether roads are likely to be floated or founded and trial pits at borrow pit locations to confirm the depth of overburden at borrow pit locations and potentially log the upper weathered rock deposits.

It is proposed to carry out exploratory rotary boreholes at selected locations along the proposed grid connection cable route where horizontal directional drilling (HDD) techniques being considered as a method of traversing existing watercourses and the M8 motorway, which cross the existing public road route between the development site and Barrymore substation.

Geophysics will be undertaken at the turbine locations and trial pits will be carried out at the proposed borrow pit locations.

The data gathered will be used to inform the final location of all turbines and associated infrastructure.

An earthworks balance calculation will be prepared for the overall development to assess where excavated material can be beneficially re-used. In addition, an assessment of the volumes of raw material will be made which will in turn be used to determine the number and size of borrow pits required.

4.7.4 Likely Significant Effects

The potential impacts of the development of the wind farm on the geology, hydrogeology and slope stability are:

- The excavation and removal of soil and rock and interference with any existing site drainage is a potential direct permanent effect that, without mitigation, could alter the existing hydrogeological balance of the site;
- Areas which are underlain by peat deposits are susceptible to slope stability issues, including peat slides and bursts, when changes are made to topography, hydrogeology and hydrology of the site;
- The use of granular fill and other materials for the construction of the access tracks has the potential to have a permanent impact on the source quarries or borrow pits;
- Soil compaction may occur due to movement of construction and maintenance traffic.

4.8 Water (Hydrology, Flood Risk and Hydrogeology)

4.8.1 Introduction

An assessment of the potential effects of the Proposed Development on hydrology and hydrogeology will be included within the EIA within which the water environment will be considered.

4.8.2 Baseline

The following key guidelines apply to the hydrology and hydrogeology assessment:

- Institute of Geologists of Ireland. Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements, April 2013;
- National Roads Authority, 2008. Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes; and
- EPA (Draft May 2017) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

The following sources of information are being consulted for the Water baseline:

- Information from site walkover;
- Preliminary flood risk assessment for the area;
- GSI Groundwater Data Viewer - bedrock and gravel aquifers, vulnerability, water supplies, groundwater recharge;
- GSI Groundwater body description documents;
- Environmental Protection Agency water maps;
- Irish Soils Information System – Teagasc;
- Teagasc/GSI/EPA Subsoil Mapping;
- GSI Groundwater Data Viewer - Bedrock Geology;
- OSi Discovery Series mapping;
- Environmental Protection Agency;

- Water Framework Directive;
- Met Éireann; and
- OPW CFRAM.

Surface Water

The site area falls within the boundary of two catchments. The north of the area is within the Barrow catchment and the surface water bodies are comprised of the tributaries of Stradbally River and Crooked River. The southern extent of the site is part of the Nore catchment with tributaries of the river Owveg and Clough traversing this area. All the surface water bodies present have a 'good' status as defined by the WFD. The Barrow and Nore catchments drain a basin area of 3,015m^2 and 2,585m^2 respectively (Catchments: www.gis.epa.ie/EPAMaps/Water).

Hydrogeology

There are several lithologies underlying the site area, with a variety of hydrogeological classifications. The Luggacurren Shale Formation and Killeshin Siltstone Formation north of the site area are are classified by the GSI's groundwater resources maps and classification system as *"Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones"*[2]. Southbound the Bregaun Flagstone Formation and Moyadd Coal Formation are classified as "*Pu - Poor Aquifer - Bedrock which is Generally Unproductive"*[2]. There are two bands of Carboniferous sandstone, the Clay Gall Sandstone Formation and the Swan Sandstone member of the Coolbaun Formation that transect these lithologies which are classified as *"Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive"*[2]. The remainder of the Coolbaun Formation in the area is classified as *"Pu- Poor Aquifer - Bedrock which is Generally Unproductive" (*Geological Survey of Ireland: www.gsi.ie). To the north of the site area, alluvium, gravels and till derived from limestone are classified as *"Lg - Locally important gravel aquifer".*

Groundwater Vulnerability

The GSI's national groundwater vulnerability map has indicated the aquifers in the area of interest classified as 'Low' to 'Extreme'. The majority of the area is classified as both category of 'Extreme' – X and E which are indicative of karst features, or more relevant here – near surface rock (Groundwater Vulnerability: www.gsi.ie). The less extensive vulnerability categories in this area are reflective of overburden permeability and thickness. The areas that are classified as 'High' would be consistent with 3-4m of moderate permeability overburden, 'Moderate' with more than 10m of moderate permeability overburden, and 'Low' with 10m but low permeability overburden.

Table 4-5 Aquifer Summary

Unit Name	Aquifer Classification
Coolbaun Formation	Pu- Poor Aquifer - Bedrock which is Generally Unproductive"
Swan Sandstone member (Coolbaun Fm)	Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive"
Clay Gall Sandstone Formation	Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive"[2]
Moyadd Coal Formation	Pu- Poor Aquifer - Bedrock which is Generally Unproductive"

Unit Name	Aquifer Classification
Bregaun Flagstone Formation	Pu- Poor Aquifer - Bedrock which is Generally Unproductive"
Killeshin Siltsone Formation	Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
Luggacurren Shale Formation	Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones

4.8.3 Scope of Assessment

The assessment will address impacts on hydrology and hydrogeology. The aspects of the water environment that could be affected by the activities associated with the proposed development will also be addressed. The scope of the assessment includes:

- An assessment of the existing water (hydrology and hydrogeology) within approximately 2 km of the application area at the wind farm;
- An assessment of the potential impact of construction and operation of the proposed wind farm on surface water and groundwater; and
- Where necessary, recommendation(s) of mitigation measures to reduce or eliminate any potential impacts.

4.8.4 Assessment Methodology

A preliminary site visit has been undertaken to establish the constraints relating to the water environment and noting hydrological features. A preliminary flood risk assessment will be undertaken to assess the impact of the proposed development on downstream flooding.

The assessment methodology to identify potential direct and indirect impacts to surface water and groundwater associated with the proposed wind farm will be a qualitative risk assessment methodology in which the nature of the potential impacts will be described in terms of the character, magnitude, duration, probability and consequence of the impact and whether they are direct or indirect impacts.

The description of the potential impact will then be screened against the significance and sensitivity of the receiving environment to establish the overall significance of the potential impact (without mitigation). The classification of the impact significance will be determined using the matrix from the EPA Guidelines (2017).

The potential impacts will initially be assessed with no mitigation or design measures incorporated to reduce the risk, and any required mitigation measures will then be outlined.

4.8.5 Likely Significant Effects

The main potential impacts from the construction of the Coolglass wind farm have been identified as the following:

Modification of natural groundwater levels

The construction of the turbines, hardstanding areas, access tracks, borrow pits and cable trenches has the potential to cause hydrogeological impacts by modifying the natural groundwater levels adjacent to the

excavation. This in turn may deprive ditches and streams of their natural supply of water which may lead to reduced base flow and recharge to the bedrock aquifer;

Groundwater pollution arising from construction or operational activities

Removal of superficial deposits may result in the exposure of the underlying rock to sources of contamination and may increase the vulnerability of the aquifer, whether or not the rock is exposed;

Chemical pollution may occur as a result of an accidental spillage or leakage of chemicals, runoff from vehicle washing facilities, unset concrete, storage of fuels or refuelling activities, etc. Chemical pollutants may enter the groundwater and have implications for ecology and any wells in the area, particularly those located down-gradient of the site.

Sanitary waste arising from temporary construction compounds could lead to contamination of groundwater.

Exposure of aquifers leading to increased risk of contamination

Removal of superficial deposits may result in the exposure of the underlying rock to sources of contamination and may increase the vulnerability of the aquifer, whether or not the rock is exposed;

Generation of turbid runoff during construction that could enter the water environment.

A number of designed-in measures will be considered to reduce the potential for impact on sensitive receptors. These will evolve over the design process in response to consultation.

Changes to surface water runoff patterns which could affect sensitive habitats such as peat.

Limited areas of peat are anticipated on the site, however this will be confirmed during the assessment of baseline conditions. Assessment will seek to establish the current hydrology of any sensitive habitat and development of the wind farm will seek to maintain the existing hydrological regimes in order to safeguard these ecosystems.

Pollution to local groundwater through foundation development.

The baseline assessment will include a review of the underlying geology including groundwater and any local users of this resource or public supply source protection areas will be identified. Appropriate design will seek to safeguard groundwater quality through best practice measure to control any potential pollution vectors.

4.9 Archaeology and Cultural Heritage

This section considers the scope of work required to assess the potential significant effects associated with archaeology and cultural heritage during the construction and operational phases of the proposed development.

On the basis of the work undertaken to date, the professional judgement of the cultural heritage team, and experience from other similar projects, it is considered that indirect and cumulative impacts of the proposed development on Locally important assets recorded on the National Heritage Inventory for Architecture can be scoped out.

It is also requested that assets that fall out with the ZTV, and where the assets approach does not fall within the ZTV, scoped out of further assessment

4.9.1 Baseline

The wider landscape in which the windfarm sits has a rich and well documented archaeological and cultural record, with evidence of occupation as early as the Bronze Age. Known archaeological sites and monuments in the surrounding area indicate a high prehistoric potential within the site, this is highlighted in the high number of Fulacht Fa which line the River Clogh, within 5km of the site.

The landscape within the 5km study area has been modified due to intensive agricultural development including; cultivation, land improvement and drainage, and large-scale forestry plantation. The study area contains some structures of architectural heritage interest, predominantly vernacular buildings and middle-sized farmhouses. It also has heritage features associated with the religion of the region, Christian Catholicism.

4.9.2 Scope of Assessment

The assessment will address features and sites of archaeological, architectural and cultural heritage significance. The purpose of the study will be to assess the significance of the receiving cultural heritage environment and to identify and evaluate the magnitude of the impact of the proposed wind farm on the sensitivity of each cultural heritage feature within this environment and on the broader historic character of the landscape. Measures will be proposed to mitigate effects (where possible) so as to allow a fully informed decision to be made by the adjudicating authority.

4.9.3 Assessment Methodology

The assessment will comprise of a desk study.

Desk Study

A review of the following information will be carried out to inform the cultural heritage assessment report:

- A review and collation of information obtained from public and statutory consultees, for example the Record of Monuments and Places (RMP) (Including National Monument in State Care, NIAH, and landscape characterisation.
- A review of the Record of Protected Structures and Architectural Conservation Areas (ACA's) in the Laois County Development Plan 2021-2027.
- A review of the National Inventory of Architectural Heritage (NIAH) building survey sites, NIAH historic gardens and designed landscapes survey sites
- A literature review of published and key references appropriate to the wind farm including material from local interest groups and historical and archaeological societies.
- Collation of information from similar or other infrastructure projects in proximity to the proposed wind farms, for example EISs, SEAs, conservation plans, archaeological test assessments and excavations (including the Database of Irish Excavations) Cartographic sources.
- A review of place names and Gaeltacht areas.
- Other documentary sources.
- A review and interpretation of aerial photographs to be used in combination with historic mapping to map potential cultural heritage assets.
- A review of existing guidelines and best practice approach will be undertaken.

Impact Methodology

Assessment Of Heritage Significance

Significance

To allow for a detailed, justifiable, and intelligible determination of cultural impact; it is necessary to establish a consistent terminology for discussing the importance of heritage assets. This is referred to variously across the heritage statute, policy, and guidance documentation, including 'importance', 'interest', 'significance', 'special interest' and 'character' amongst others. For the purposes of this assessment, the term 'significance' has been used consistently hereafter.

The Framework and Principles for the Protection of the Archaeological Heritage, which relates specifically to archaeology, provides the following:-

> *"Any material remains which can contribute to understanding past societies may be considered to have an element of archaeological significance… Archaeological significance or interest may also be seen in terms of the potential for sites, monuments or artefacts to enable people to experience directly the evidence for past societies and through this allow them to better understand and appreciate their own past."*

A more detailed approach is provided within Architectural heritage protection: guidelines for planning authorities, which conceives of heritage significance as deriving from the following categories of 'special interest':

- Architectural;
- Historical;
- Archaeological;
- Artistic;
- Cultural;
- Scientific;
- Technical; and
- Social.

This guidance, which derives principally from the terms of the Granada Convention, makes the further point that these categories are not mutually exclusive, such that an asset might derive its significance from one, multiple or all these interests.

In accordance with this guidance, the significance of the heritage assets described within this assessment is discussed in terms of these contributing interests, enabling consistent, detailed, justifiable, and intelligible determinations of heritage significance to be made.

Table 4-6 shows the potential levels of the heritage significance of an asset related to designation, status and grading, and where non-designated, to a scale of Highest to Negligible importance. This table acts as an aid to consistency in the exercise of professional judgement and provides a degree of transparency for others in evaluating the conclusions reached by this assessment.

Table 4-6 Heritage Significance

Heritage Significance	Explanation
Highest	Sites of international importance, including:- • World Heritage Sites;
High	Site of National importance, including:- • National Monuments, including those recorded on the Sites and Monuments Record (SMR) • Nationally Important assets recorded in the National Inventory of Architectural Heritage (NIAH) • Buildings on the record of protected structures as identified by the Laois County Development Plan 2021-2027
Medium	Sites of Regional importance, including:- • Sites on the Record of Monuments and Places, found within the relevant County Development Plan • Regionally Important assets recorded in the National Inventory of Architectural Heritage (NIAH) • Heritage towns and Zones of Archaeological potential
Low	Sites of minor importance or with little of the asset remaining to justify higher importance. Locally Important assets recorded in the National Inventory of Architectural Heritage (NIAH)
Negligible	Negligible or no heritage significance
Unknown	Further information is required to assess the significance of these assets.

4.9.4 Magnitude of Impact

Determining the magnitude of any likely impacts requires consideration of the nature of activities proposed during the period of continued operation of the wind farm.

The changes could include direct change (e.g., ground disturbance), and indirect change (e.g., visible change, noise, vibration, traffic movements affecting the setting of the asset). Impacts may be beneficial or adverse and may be short term, long term or permanent. The magnitude of impact has been assessed with reference to the criteria set out in Table 4-7. The magnitude of both beneficial and adverse impact is assessed according to the scale of impact, from high to neutral/none.

Table 4-7 Archaeology and Cultural Heritage Magnitude of Impact

Magnitude of Impact	Explanatory criteria
High Beneficial	The proposed development would considerably enhance the heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Medium Beneficial	The proposed development would enhance to a clearly discernible extent the heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Low Beneficial	The proposed development would enhance to a minor extent the heritage significance of the affected asset, or the ability understand, appreciate, and experience it.
Very Low Beneficial	The proposed development would enhance to a very minor extent the heritage significance of the affected asset, or the ability understand, appreciate, and experience it.
Neutral/None	The proposed development would not affect or would have harmful and enhancing effects of equal magnitude on the heritage significance of the affected asset, or the ability to understand, appreciate, and experience it.
Very Low Adverse	The proposed development would erode to a very minor extent the heritage significance of the affected asset, or the ability understand, appreciate, and experience it.
Low Adverse	The proposed development would erode to a minor extent the heritage significance of the affected asset, or the ability to understand, appreciate, and experience it.
Medium Adverse	The proposed development would erode to a clearly discernible extent the heritage significance of the affected asset, or the ability to understand, appreciate, and experience it.
High Adverse	The proposed development would considerably erode the heritage significance of the affected asset, or the ability to understand, appreciate and experience it.

Significance of Impacts

The significance criteria are presented in Table 4-8. Table 4-9 provides a matrix that relates the heritage significance of the asset to the magnitude of impact on its significance (incorporating contribution from setting where relevant), to establish the likely overall significance of effect. This assessment is undertaken separately for direct effects and indirect effects, the latter being principally concerned with effects through development within the setting of heritage assets. Those assets which the matrix scores as Profound would be considered as receiving a significant effect.

Table 4-8 Archaeology and Cultural Heritage Significance Criteria

Significance	Description
Profound	The development would destroy all characteristics which are intrinsic to the asset.
Very Significant	An effect which, by its character, magnitude, duration, or intensity significantly alters most of a sensitive aspect of the environment.
Significant	The development would create an effect on a designated asset which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment
Moderate	An effect which alters the character of the environment in a manner that is consistent with existing or emerging trends
Slight	The development would not have an effect that causes noticeable changes in the character of the environment but without affecting its sensitivities
Not Significant/ Imperceptible	The development would have no effect which causes noticeable changes in the character of the environment but without significant consequences

Table 4-9 Archaeology and Cultural Heritage Significance of Effect

Magnitude of Impact	Heritage Significance (excluding negligible and unknown)			
	Highest	High	Medium	Low
High beneficial	Profound	Profound	Very Significant	Significant
Medium beneficial	Profound	Very Significant	Significant	Moderate
Low beneficial	Very Significant	Significant	Moderate	Moderate
Very low beneficial	Significant	Moderate	Slight	Slight
Neutral/None	Not Significant/ Imperceptible	Not Significant/ Imperceptible	Not Significant/ Imperceptible	Not Significant/ Imperceptible
Very low adverse	Significant	Moderate	Slight	Slight
Low adverse	Very Significant	Significant	Moderate	Moderate
Medium adverse	Profound	Very Significant	Significant	Moderate
High adverse	Profound	Profound	Very Significant	Significant

Zone of Theoretical Visibility (ZTV) Analysis

The assessment of visual impact has been assisted by a ZTV calculation, prepared principally for landscape and visual impact assessment, and presented in Figure 4-1. The ZTV maps predict the degree of visibility of the proposed development from points within a study area around the site, as would be seen from an observer's eye. The ZTV model has been used to inform the likely effects on the setting of cultural heritage assets within the study area. The study area is defined as 10km from the proposed development site boundary.

The ZTV is theoretical because it is based on landform only and does not take into account the screening or filtering effects of vegetation, buildings or other surface features, and in that respect is likely to provide an overestimate of the actual visibility.

Assets that fall out with the ZTV are excluded from further assessment, except where a view is identified which includes the heritage asset and the wind turbines, and that view may enable appreciation of the assets' heritage significance.

Cumulative Effects

A cumulative assessment will be assessed. The assessment will consider all developments identified in Chapter 3 of the EIAR once produced; however, it is assessed that the most likely source of cumulative effects arises from other wind energy developments within 10km of the affected heritage asset, depending on the heritage significance of the asset, that have been given planning consent, have an active planning application or are undergoing a planning appeal. Cumulative effects are assessed with regard to assets that have been assessed as receiving an above negligible impact from the proposed Development. Operational wind farms are considered as part of the baseline assessment.

Mitigation

A statement of the proposed mitigation of the identified impacts follows the assessment. The main approach to mitigation is through design: avoidance of direct impacts on heritage assets has been a consideration throughout the design process, and post consent this would continue, e.g., through micro siting. Screening to avoid impacts on the setting of assets is rarely feasible for wind turbines, but has been considered where other effects from other infrastructure may be mitigated in this way

Residual Effects

A statement of the residual effects has been given following consideration of any further site-specific mitigation measures, where these have been identified.

4.9.5 Likely Significant Effects

Assets where key consideration will be given to the potential impact on the integrity of the monument are as follows:

- A series of Enclosures and Raths that may relate to one another in defensive positioning around the valley:

LA000798- Enclosure

LA001170- Ringfort-Rath

LA001172- Enclosure

LA001175- Ringfort-Rath

- Prehistoric Activity surrounding Swan:

Fulacht Fa (LA01628, LA01630, LA01631, LA01632, LA01609, LA01610)

Standing Stones (LA01633)

Barrow (LA0162, LA01626)

4.10 Access, Traffic and Transport

This Section considers the scope of work required to assess the potential significant effects associated with access and traffic and transport during the construction and operational phases of the proposed development.

4.10.1 Baseline

The study area for assessment will be the R425 and R426, from the junction with the R445 to the junction with the L3851; it will also include the L3851 to each of the site access locations. The total distance of the roads within the study area is approximately 21.4km. Traffic data will be obtained so that existing traffic flows and vehicle classification for the key roads is identified, informing the baseline situation. Injury accident data for the roads within the study area will be obtained to ensure road safety issues are identified. Automatic traffic counts (ATCs) will be placed on the L3851 and the R426.

All abnormal indivisible loads (AILs) and most construction vehicles would travel along the R426 from the M7 to each site access on the L3851. The proposed route would not be assessed within this section of the EIA Report for AILs as a separate Turbine Delivery Route (TDR) Assessment will be submitted; the findings from the TDR Assessment will be considered within this section of the EIAR.

4.10.2 Scope of Assessment

The port of entry for AILs has been identified as Dublin Port, with a route via the M50 and M7 to Portaloise. AILs would exit the M7 at Junction 16, heading southwest along the R445 for a short distance before turning south onto the R425. The R425 would be followed to the R426, where the AILs will continue for approximately 12.8km. At the junction of the R426 with the L7791 and the L3851, the AILs will head east towards Luggacurren. Access to Access Point 1 (AP1) is located 1.5km east along the L3851, with access to Access Point 2 (AP2) a further 2.1km along the L3851. It is anticipated that this route would also be used for the majority of construction traffic however this will be confirmed within the EIA Traffic and Transport Chapter.

The assessment is required to evaluate the effects of the proposed development and to determine the scale of the impacts on the identified sensitive receptors. From a desktop study of the site access and the proposed delivery route, the main receptors, sensitive to increased traffic levels, are anticipated to be located along the R426 where there are a number of small communities which include Sheffield Cross, Timahoe and Ballydonnell. These communities include residential properties and non-residential properties such as public houses, businesses (café, shops) and churches. There are also several individually placed dwellings, away from the villages, as well as farms along the delivery route.

The assessment will focus on the delivery of construction materials with a Turbine Delivery Route (TDR) included as a Technical Appendix to the EIA Report.

Consultation

Consultation will be undertaken with the local community with respect of traffic management proposals. The scope of the study and assessment for the proposed development in relation to access, traffic and transport will seek to identify potential issues which may result from the construction of the development.

The proposed development will continue to be discussed with the following prescribed bodies and key stakeholders/ organisations:

- Laois County Council - Consultation to discuss the potential impacts of the proposed development on the local road network and cumulative traffic effects;
- Transport Infrastructure Ireland (TII); and
- Dublin Port.

4.10.3 Assessment Methodology

Method of Assessment and Reporting

The Access, Traffic and Transport Section of the Environmental Impact Assessment Report (EIA Report) will include a detailed evaluation of the baseline conditions and will focus on assessing the potential impacts to arise during the construction phase. This will include an abridged construction works programme, details of vehicle types and sizes to be used during the construction phase, and an estimate of the number of trips anticipated to be generated by HGVs, LGVs and light vehicles. Mitigation measures to alleviate the known local traffic issues arising from the wind farm construction traffic will be identified, with the aim of reducing the effect of the vehicle movements identified.

Desk Study

The following data collection and analysis will be undertaken:

- a review of available nearby wind farm development application documents;
- a review of the TDR;
- analysis of traffic count data and accident data;
- assessment of traffic impacts of previous and committed local wind farm developments to understand identified effects;
- compilation of data on the number of construction vehicles and staff numbers likely to be present on the local road network during the construction phase;
- review anticipated construction programme (once available);
- a comparison between likely traffic flows on potentially affected roads against the baseline situation for a future year scenario with and without the development of Coolglass Wind Farm, reported as percentage increases;
- a review of height and weight restrictions along the proposed construction transport routes; and
- Identification of the impacts.

Field Surveys

An inspection of the key TDR has been completed from Dublin Port to the site access locations and involved a visual inspection of the route to identify any likely constraints or issues. In addition, each site access location has been considered as part of the site visit.

It would be common practice for traffic surveys to be commissioned in order to provide a baseline situation for traffic flows, movements and speeds. An Automatic Traffic Counter (ATC) on the L3851 between the two access locations would be commissioned to collected data for 24 hours a day across a seven-day continuous period; an additional survey would be commissioned for the R426 to the north of the junction with the L3851. The traffic data collected will provide classified and directional traffic flow data. Speeds would also be recorded in order to determine the 85th percentile speeds and would be used to determine whether the access junction has sufficient visibility splays. Should a traffic count be unable/ unacceptable for commissioning, Laois County Council and Transport Infrastructure Ireland would be further consulted for existing traffic data along the delivery route. A quick search on the TII Website has confirmed that there are no traffic counters located within the study area and so it will be important to commission traffic surveys.

Mitigation Measures

Mitigation measures will be proposed following the completion of the impact assessments, as informed by the baseline. The purpose of these measures is to aim to remove, minimise, or compensate any significant effects. These mitigation measures will be agreed with LCC and TII.

Assessment

The Institute of Environmental Management and Assessment (IEMA) guidance (1993) would form the basis for which the effects of traffic during the construction phase would be assessed. Based on the IEMA guidance, the factors identified as being the most discernible potential environmental effects likely to arise from changes in traffic movements have been set out below and would be considered in the assessment as potential effects which may arise from changes in traffic flows from the proposed development.

- noise and vibration – the potential effect caused by additional traffic on sensitive receptors;
- driver severance and delay – the potential delays to existing drivers and their potential severance from other areas;
- community severance and delay – the potential severance to communities and the delays to movements between communities;
- vulnerable road users and road safety – the potential effect on vulnerable users of the road (i.e. pedestrians and cyclists);
- hazardous and dangerous loads – the potential effect on road users and local residents caused by the movement of abnormal loads; and
- dust and dirt – the potential effect on dust, dirt and other detritus being brought onto the road and impact on road conditions.

The IEMA guidelines provide two thresholds when considering predicted increase in traffic, whereby a full assessment is required:

- where the total traffic would increase by 30% or more (10% in sensitive areas); and/ or
- where the HGV traffic would increase by 30% or more (10% in sensitive areas).

The potential sensitivity of the receptors to changes in traffic levels would be determined by considering the study area and presence of receptors in relation to each potential impact. The receptors would be assessed individually to determine its sensitivity and the assessment criteria is set out in Table 4-10. Magnitude criteria is set out in Table 4-11.

Table 4-10 Traffic and Transportation Receptor Sensitivity

Impact	Low Sensitivity	Medium Sensitivity	High Sensitivity
Noise and Vibration	No sensitive receptors	Presence of sensitive receptors near to the road	Presence of sensitive receptors adjacent to the road
Driver Severance and Delay	Road network not affected	Road network not experiencing congestion at peak times	Road network experiencing congestion at peak times
Community Severance and Delay	No presence of existing communities severed by road	Presence of existing communities with a moderate level of existing severance (subjective assessment)	Presence of existing communities with low existing severance (subjective assessment)
Vulnerable Road Users and Road Safety	High sensitive receptor		
Hazardous and Dangerous Loads	No hazardous or dangerous loads on the road network	Some hazardous or dangerous loads on the road network	Abnormal and oversized loads to use road network
Dust and Dirt	Limited presence of sensitive receptors (subjective assessment)	Low to medium presence of sensitive receptors (subjective assessment)	High presence of sensitive receptors (subjective assessment)

Table 4-11 Traffic and Transportation Magnitude Criteria

Impact	Negligible	Minor	Moderate	Major
Noise and Vibration	<25% increase in traffic	>25% increase in traffic Quantitative assessment based on predicted increase in traffic against measured baseline		
Driver Severance and Delay	<10% increase in traffic	>10% increase in traffic Quantitative assessment of road capacity based on existing traffic flows and predicted future traffic levels		
Community Severance and Delay	<10% increase in traffic	<30% increase in traffic	<60% increase in traffic	>60% increase in traffic
Vulnerable Road Users	<10% increase in traffic	>10% increase in traffic Quantitative assessment of existing provision and future traffic levels		
Road Safety	<10% increase in traffic	>10% increase in traffic Quantitative assessment of existing accident records and predicted increases in traffic		
Hazardous and Dangerous Loads	0% increase in traffic	<30% increase in traffic	<60% increase in traffic	>60% increase in traffic
Dust and Dirt	<10% increase in traffic	<30% increase in traffic	<60% increase in traffic	>60% increase in traffic

References and Standard Guidance

The access, traffic and transport assessment will be carried out in accordance with the following policy and guidance documents:

- EU Directive 2014/52/EU;
- Institute of Highways and Transportation (IHT) publication 'Guidelines for Traffic Impact Assessment';
- 'Guidelines for the Environmental Assessment of Road Traffic' (1993) for the IEMA;
- Transport Infrastructure Ireland and Laois County Council Design Standards (as required); and
- DfT 'Design Manual for Roads and Bridges' (DMRB).

4.10.4 Likely Significant Effects

Potential Sources of Impact

The potential sources of impact have been divided into three development phases: construction, operation and decommissioning. In summary, the main potential sources of impact are likely to relate to the impact of construction and decommissioning traffic on the residential areas along the network route.

Construction Phase

The construction phase of Coolglass Wind Farm is likely to create the greatest environmental impacts. This is due to the number of Heavy Goods Vehicles (HGVs) and Light Goods Vehicles (LGVs) required to transport the materials on site; as such there would be likely significant effects of traffic associated with the communities and roads along the delivery routes.

Operational Phase

Once Coolglass Wind Farm is operational, the development would have negligible traffic/transport related impacts caused by intermittent maintenance vehicles travelling to the site.

Decommissioning Phase

Once the proposed development is decommissioned, the development would have similar impacts as those during construction phase.

Cumulative Assessment

The cumulative impacts from the other local permitted wind farm developments will be a key consideration for the assessment, particularly in relation to the control of construction traffic in the local area. The cumulative assessment would focus on the construction phase as this would be the most likely period to create significant effects should construction phases overlap or occur sequentially amongst permitted developments.

The traffic assessment and draft traffic management plans would be reviewed for the other developments identified to be of direct relevance and on a similar construction and decommissioning timeline to Coolglass Wind Farm. The proposed construction timescales for these developments would be carefully considered. Operational sites are unlikely to create significant traffic effects and will, therefore, not be considered within the cumulative assessment. The assessment would focus on consented developments at application stage within close proximity to the site. Such sites will be identified and discussed with Laois County Council (LCC).

4.11 Landscape and Visual

The Landscape chapter will describe the methods to be applied in the identification and assessment of landscape and visual impacts associated with the proposed Coolglass Wind Farm. The site is contained on a series of elevated hills that straddle the border between County Laois and County Kilkenny between the settlements of Timahoe to the north and The Swan to the south.

4.11.1 Baseline

The landscape baseline relates to the physical landscape in terms of topography, landcover and landscape features, which combine to determine the receiving landscape character. In this instance a 20km radius study area will be used for the landscape and visual assessment, in accordance with the Irish Wind Energy Development Guidelines (2006 and Draft Revised 2019). The topography ranges between the low rolling hills of the site and

central study area to the broad, flat lowlands of County Laois and County Kildare further to the north and northeast. The Castlecomer Plateau of north-eastern Kilkenny occurs in the southern portion of the study area. Land cover predominantly consist of arable and pastoral farmland throughout the lowland context interspersed with large peatland and cutaway peatland areas in the northern half of the study area. The elevated hill country in the central and southern portions of the study area also hosts large commercial conifer plantations in combination with extensive farmland. The site is contained within the 'Hills and Upland' Character Area of the Laois County Landscape Character Assessment and is described in the following manner: "*The hills act as orientating features. The Seven Hills, Cullenagh, Cullahill, Fossy Mountains and the upland areas around Swan, Luggacurren and Wolfhill are prominent by virtue of landmarks at their summits as well as their topography: A church on the Wolfhill acts as a prominent local landmark*."

The visual baseline relates to places from which people will potentially see the proposed development including centres of population, major routes as well as the local roads and residences within the central study area. Other sensitive visual receptors include scenic designations (routes and views) identified in the relevant county development plans. Tourism, amenity and heritage locations are also considered to be sensitive visual receptors. In the case of Coolglass Wind Farm, the farmed and forested hills of the central study area are relatively lightly populated but with occasional small settlement clusters such as Wolfhill and Luggacurren. Timahoe and The Swan are slightly larger settlements within the central study area, whilst in the wider study area are the major towns of Portlaoise to the northwest and Carlow to the southeast. The M7 motorway passes through the lowlands of the northern study area, whilst the nearest major routes to the site are the R426 and R430 regional roads to the southwest. A key amenity and heritage feature is the Rock of Dunamase around 10km to the north of the site, which hosts extensive fortress castle ruins. There are numerous scenic route and view designations within the counties contained within the study area, but few of these are close to the proposed site and/or oriented towards it

4.11.2 Scope of Assessment

The Landscape chapter describes the landscape context of the proposed development and assesses the likely landscape and visual impacts of the scheme on 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. Visual Impact Assessment (VIA) relates to assessing effects on specific views and on the general visual amenity experienced by people. Cumulative landscape and visual impact assessment is concerned with additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future.

Aspects to be addressed in the chapter are set out in Table 4-12.

Table 4-12 Landscape Aspects To Be Addressed

Aspect to be Addressed	Detail
Receiving environment, covering details on:	• wider landscape context and localised site context. • Landform, landcover, land use patterns and trends • key/unique landscape elements and features • defining attributes of the wider landscape

Aspect to be Addressed	Detail
Landscape character, covering details on:	• Landscape character as outlined in the relevant County Development Plans (Laois, Kilkenny Carlow and Kildare), but predominantly Laois and Kilkenny. • Associated landscape values • Sensitivity levels within the landscape • Statutory designations and Landscape designations • Designated Scenic/amenity routes • Scenic Views and prospects • Tourism, Amenity and Heritage features
Landscape Policy Context:	• Relevant policy objectives within predominantly Laois CDP and Kilkenny CDP • Relevant policy objectives within other counties contained within the 20km Study Area (Objectives appendicised).
Visual context:	• Zone of Theoretical Visibility • Viewshed Reference Points (Detailed assessments appendicised). • Route Screening Assessment (Detailed findings appendicised).

Residential Amenity Assessment will be assessed with detailed findings in an Appendix as part of the Population and Human Health Chapter of the EIAR.

Assessment of these aspects will ultimately inform potential landscape, visual and amenity aspects, residual impacts, and in turn appropriate mitigation measures to ensure impacts are not significant.

4.11.3 Assessment Methodology

The Landscape and Visual Assessment of the proposed development will be undertaken in accordance with the Landscape Institute and the Institute of Environmental Management and Assessment publication entitled 'Guidelines for Landscape and Visual Impact Assessment' – Third Edition (2013). This is recognised as the principal best practice guidance for landscape and visual assessment of all forms of development in Ireland and the UK.

Regard will also be given to the overarching Environmental Impact Assessments guidelines and advice notes set out by the EPA:

- Environmental Protection Agency (EPA) Guidelines on the Information to be contained in the Environmental Impact Assessment Reports (EPA, 2017)
- EPA Advice notes on Current Practice in the Preparation of Environmental Assessment Reports (EPA, Draft 2015)

Other relevant LVIA and wind energy specific guidance that will be considered includes:

- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2006).
- Scottish Natural Heritage (SNH) Siting and Designing Wind Farms in the Landscape (version 3a – 2017)

- Scottish Natural Heritage (SNH) Assessing the Cumulative Impact of Onshore Wind Energy Developments (2012).
- Scottish Natural Heritage (SNH) Visual representation of wind farms: Best Practice Guidelines (version 2.2 - 2017).

Production of the Landscape and Visual Impact Assessment involves baseline work in the form of desktop studies and fieldwork comprising professional evaluation by qualified and experienced Landscape Architects. This entailed the following:

Desktop Study

- Establishing an appropriate Study Area from which to study the landscape and visual impacts of the proposed Coolglass Wind farm – 20km in this instance, in accordance with the Wind Energy Development Guidelines 2006;
- Review of a Zone of Theoretical Visibility (ZTV) maps, which indicates areas from which the development is potentially visible in relation to terrain within the Study Area;
- Review of relevant County Development Plans, particularly with regard to sensitive landscape and scenic view/route designations;
- Selection of potential Viewshed Reference Points (VRPs) from key visual receptors to be investigated during fieldwork for actual visibility and sensitivity;
- Consultation with the local community and the Local Authority in respect of sensitive VRP locations to be included in the assessment.

Fieldwork

- Recording of a description of the landscape elements and characteristics within the Study Area.
- Selection of a refined set of VRP's for assessment. This includes the capture of reference images and grid reference coordinates for each VRP location for the visualisation specialist to prepare photomontages.

Appraisal

- Consideration of the receiving landscape with regard to overall landscape character as well as the salient features of the study area including landform, drainage, vegetation, land use and landscape designations.
- Consideration of the visual environment including receptor locations such as centres of population and houses; transport routes; public amenities and facilities and; designated and recognised views of scenic value.
- Consideration of design guidance and planning policies.
- Consideration of potentially significant effects and the mitigation measures that could be employed to reduce such effects.
- Assessment of the significance of residual landscape impacts.
- Assessment of the significance of residual visual impacts aided by photomontages prepared at all of the selected VRP locations.
- Assessment of cumulative landscape and visual effects in combination with other surrounding developments that are either existing or permitted.

4.11.4 Cumulative Impacts

In terms of cumulative impacts there are no other existing or permitted wind farms within 10km of the site, so it is very unlikely the significant cumulative effects could occur. The nearest wind farm is Gortahile, which consists of 8 turbines and lies around 11km to the southeast of the site. Pinewoods Wind Farm (consented, not constructed) is located 8km southwest of the site.

4.11.5 Likely Significant Effects

The proposed wind turbines will be large moving structures with the potential to have significant landscape and visual impacts. The development of wind farms, including associated infrastructure such as tracks and ancillary buildings also has the potential for significant physical impact on the landscape within the site.

The significance of both landscape impacts and visual impacts is assessed on the basis of weighing visual/landscape receptor sensitivity (i.e. value and vulnerability) against landscape / visual impact magnitude (i.e. scale and nature of change). Consequently, the greatest potential for significant impacts to occur is in respect of highly sensitive receptors, especially where such receptors are in close enough proximity to the proposed development that they may experience a high magnitude of change.

Whilst there are few relevant scenic designations within close proximity to the site, there are numerous local roads and residences in close proximity from which viewers could experience a high magnitude of visual change potentially resulting in significant impacts. Aside from these potential significant effects, there is a considerable number of visual receptors within the wider context of the study area (roads, residents, settlements, heritage and amenity areas) where non-significant visual impacts will occur.

A preliminary Zone of Theoretical Visibility Map has been produced and in combination with initial fieldwork and desktop studies, a series of preliminary VRPs has been selected. It is considered pertinent to include the ZTV map and preliminary viewpoint map at scoping stage as it allows the Planning Authority and relevant stakeholders to provide opinion on the number and location of selected viewpoints and where necessary, suggest additional views for assessment. See Figure 4-1 and Figure 4-2.

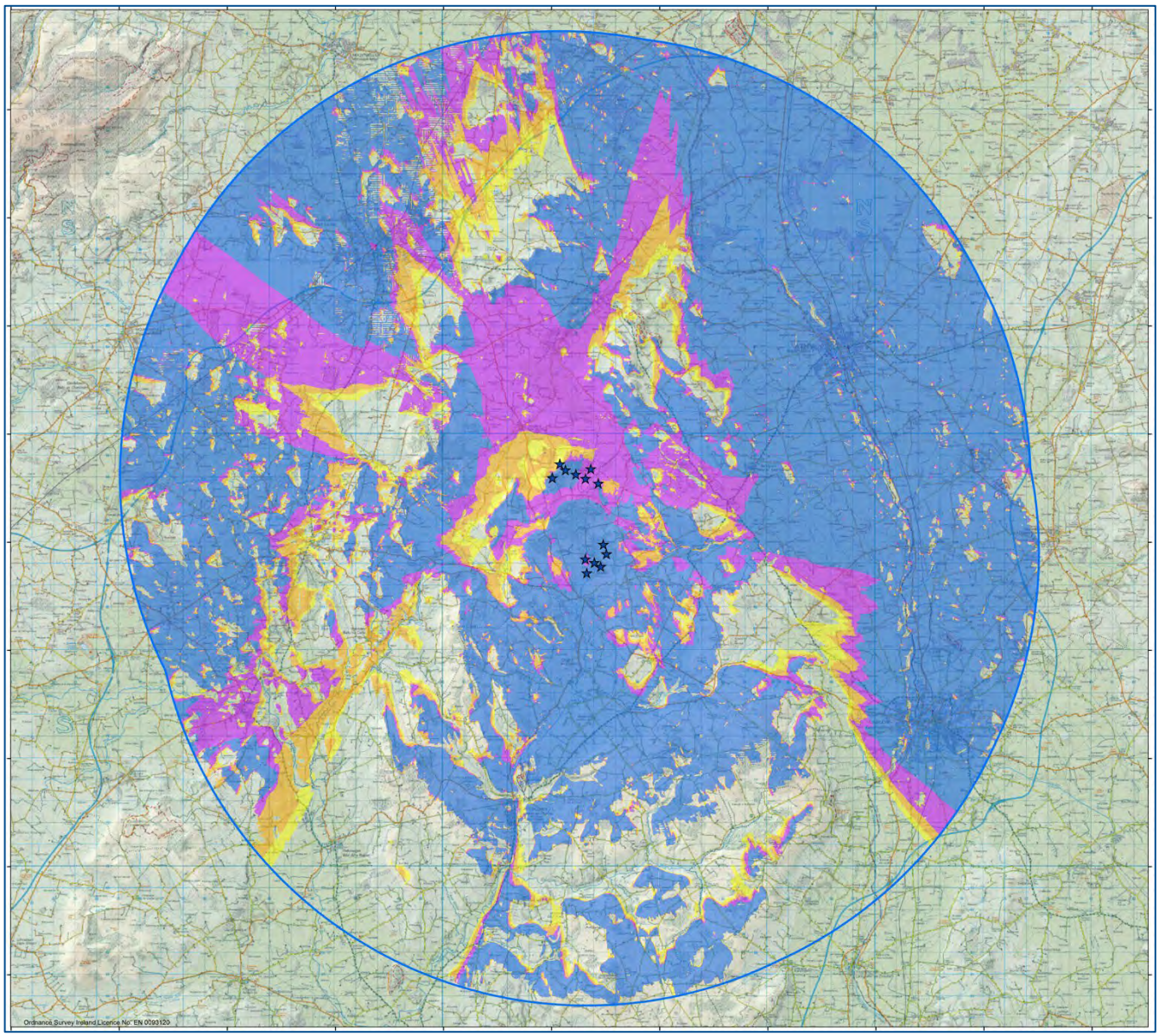

Figure 4-1 Zone of theoretical Visibility Map (Tip Height)

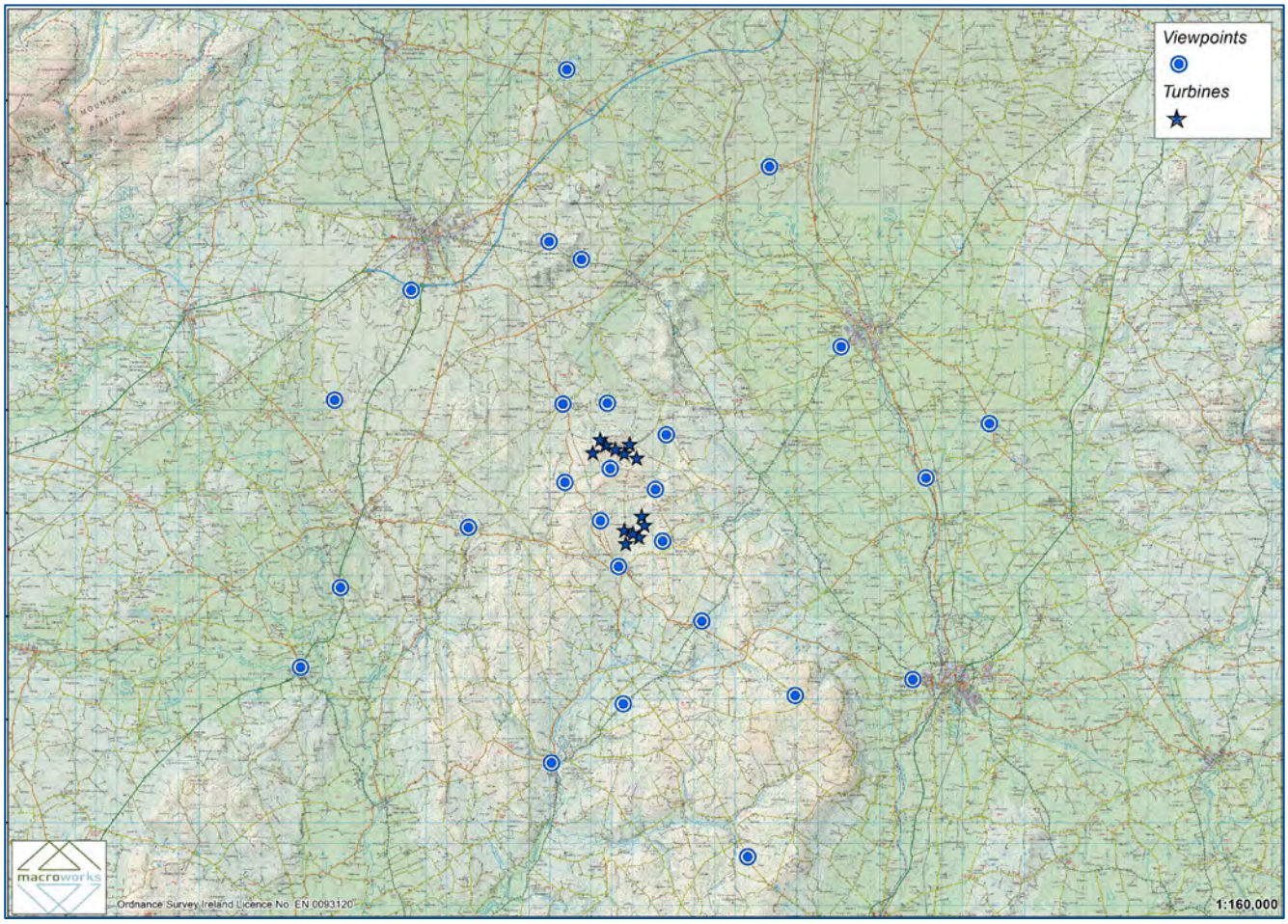

Figure 4-2 Preliminary Viewpoint Location Map

4.12 Population, Human Health and Material Assets

4.12.1 Introduction

This chapter will consider population, human health in the receiving environment and the potential significant impacts associated with all stages of the proposed development. This includes consideration of impacts on land-use, population, socio-economic activity and employment, tourism, amenities and recreation, health and safety and human health. This chapter will also assess

Material Assets will consider the impact of the proposed development on physical infrastructure including renewable and non-renewable resources as well as utility infrastructure.

4.12.2 Baseline

The subject site is located in within an upland area of County Laois near the villages of Timahoe, Wolfhill and Swan. It extends over an area known as Fossy Hill, Fennels Cross and Wolfhill. The application site itself is

elongated in shape (approximately 6km roughly north – south), within 2 no. cluster areas. The site is located approximately 1km from the village of Luggacurren and 1km from the village of Swan, both in County Laois. Upon initial examination, it is observed that there are 50 residential receptors within 1km of the application site, 50 residential receptors within 500m of the proposed Pinewoods grid route and 105 residential receptors within 500m of the proposed Coolnabacky grid route

Following a review of County Development data from the Laois County Development Plan 2021-2027 in addition to information gathered from site visits, it has been observed that there are a number of listed trails in the area and adjacent to the site, including:

- The Swan Loop;
- Fossy Mountain;
- The Esker Walk; and
- Timahoe to Clopoock public right of way.
- Timahoe to Clopook forest and road walk.

While no listed trails are contained within the site, it is worth noting that public access throughout the site is well established via the existing forestry access roads across the northern portion of the site. The site therefore has some amenity value for the local community, however, it is not the only local amenity available to the local community.

4.12.3 Scope of Assessment

The Population and Human Health and Material Assets Chapter of the EIAR will assess the likely significant effects of the proposed development on Population, Human Health and Material Assets with a particular reference to the topics of population, human health, socio-economic activity, land-use, recreation, amenity and tourism, and material assets. These are set out in Table 4-13.

Table 4-13 Population, Human Health and Material Assets Scope of Assessment

Topics of Assessment	Scope
Population	The potential impacts of the proposed development on population trends and statistics on population (density, age) will be addressed in this chapter.
Human Health	The potential impacts on human health from the proposed development will be assessed.
Health and Safety	Details relating to health and safety arising from the proposed construction, operation and decommissioning of the proposed development will be assessed.
Socio-economic Activity	The potential impacts of the proposed development on employment and the main economic activities of the area will be addressed in this chapter.
Land Use	The assessment will address the potential impacts of the proposed development on land use.

Topics of Assessment	Scope
Recreation, amenity and tourism	The assessment will address the potential impacts of the proposed development on residential amenity, recreational facilities and tourism of the area.
Material Assets	The potential impact of the proposed development on physical infrastructure including renewable and non-renewable resources as well as utility infrastructure will be assessed.

4.12.4 Assessment Methodology

Population

With the purpose of analysing population trends and statistics on the proposed area, population data from the Central Statistics Office will be obtained for the study area defined by electoral division. The statistics of this data is compared against county and state trends, density and age.

Human health

The assessment will contain a desk study review of the impacts of the operation of renewable energy developments on human health using published and verified sources of information.

Health and Safety

The assessment will contain a desk study review of the impacts of the operation of renewable energy developments on health and safety using published and verified sources of information.

Socio-economic activity

Data from the Central Statistics Office will be used to define the socio-economic baseline. The potential positive and negative impacts of the proposed development on population, employment and economic activity both directly and indirectly, will be assessed.

Land-use

The land uses in the area, which could potentially be affected by the proposed development, will be described using Corine 2018 land cover data and if necessary, this data will be verified by subsequent walkovers and drive-by surveys.

Recreation, Amenity and Tourism

All areas of scenic beauty in addition to heritage, culture and leisure facilities in the areas will be identified. A review of the main recreational activities in the area likely to be affected will be conducted. Residential amenities and recreational facilities, such as forestry in public ownership, walking paths, sports facilities, will be recorded and potential impacts assessed.

An assessment will then be conducted for each element of the proposed development to ascertain any potential impacts that may arise which could directly or indirectly affect recreational activity or an amenity. This assessment will be prepared giving cognisance to other disciplines such as cultural heritage and archaeology, hydrology and ecology.

A review will be conducted of a number of published studies and surveys which have been conducted both in Ireland by Fáilte Ireland and in the UK on the attitude of tourists to wind farms. A study of the potential impacts

that the proposed development may have on the tourism of the region will be carried out by reviewing Fáilte Ireland surveys, appraising the existing patterns of the tourism within the county and appraising the impacts that wind farms have on tourism in other counties and countries.

Material Assets

Information on the existing material assets within the receiving environment will be obtained and assessed in the context of the proposed development. The proposed development will also be considered under the material assets section in its own right as it will be classed as a renewable resource.

4.12.5 Likely Significant Effects

Population

The potential impacts arising from the proposed development on population during construction are likely to be slight positive, given the opportunities for enhanced employment opportunities associated with the proposed development. During operational phase these impacts would likely be reduced to imperceptible. The assessment will consider the potential impacts during all phases of the proposed development.

Human Health

The potential affects arising from the proposed development can impact human health during construction, operational and decommissioning will be considered in this chapter. Once operational, turbines contribute to the production of renewable energy and for this reason, it is thought that the operational phase will deliver positive impacts to human health.

Health and Safety

If not properly designed and constructed, there is the potential for construction and operational activities associated with the proposed development to impact on the health and safety of employees associated with the development as well as the public. Best practice construction and environmental management measures will be employed to prevent the potential for accidents. The EIAR will be accompanied by a comprehensive Construction and Environmental Management Plan (CEMP) which will include detailed health and safety requirements during the construction, operation and decommissioning of the proposed development. With the implementation of measures outlined in the EIAR and CEMP, it is anticipated that the proposed development is not likely to have a potential significant impact on human health and safety.

Socio-Economics

The proposed development will have significant long- and short-term benefits for the local economy including job creation, landowner payments, local authority commercial rate payments and a Community Benefit Scheme. These will be developed in full and considered in the EIAR.

Land Use

The proposed development will require land take for the access tracks, wind turbines bases and adjacent hard-standings and sub-station footprints. The current land uses will continue other than within this land take. Full details will be contained in this chapter of the EIAR. Recreation, Amenity and Tourism Potential construction impacts from the grid connection cables include full or partial closure of roads used within the area, while the cables are being installed. There may be disruption to access routes and walking paths, however any disruption will be mitigated where possible by maintaining access for people throughout, and where this is not possible, in minimising the impact, clearly communicating the timing and scope of works to the local community.

Material Assets

Material Assets Utilities such as overhead power lines or telephone lines or underground services may require diversion or be temporarily disrupted during the construction of the wind farm or cable trench. This has the potential to impact on nearby dwellings and commercial / industrial activities. All potential impacts will be considered in full in this chapter.

4.13 Shadow Flicker

4.13.1 Introduction

Under certain combinations of geographical position and time of day, the sun may pass behind the rotors of a wind turbine and cast a shadow over neighbouring properties. When the blades rotate the shadow cast flicks on and off, with the resulting effect being known as 'shadow flicker'. In accordance with Irish Wind Energy Guidance, only properties at a distance of less than 10 rotor diameters from a turbine will be assessed for shadow flicker.

Where properties meet these criteria, and there is therefore a potential for a shadow flicker effect, the seasonal duration of the effect will be calculated from the geometry of the turbine, and the latitude of the site, and this will be used to assess potential impacts on the amenity of local residents. The potential for shadow flicker effects to occur would be calculated using ReSoft WindFarm software. This software calculates times throughout a year when a turbine rotor viewed from the window of a house is in line with the sun and therefore the potential for shadow flicker exists, by modelling the location of the wind turbines and residential properties relative to the sun's position.

4.13.2 Baseline

The proposed development is located in a semi-rural area and as such there are a number of properties within 10 rotor diameters of the proposed turbine locations. A full shadow flicker model and assessment will therefore be required.

4.13.3 Scope of Assessment

The effect known as "shadow flicker" occurs where the rotating blades of a wind turbine cast a moving shadow which, if it passes over a window in a nearby house or other property results in a rapid change or flicker in the incoming sunlight. This effect will occur only for a short period during a given day and only under specific concurrent circumstances, namely when:

- the sun is shining relative to the position and distance of the receptor to the turbine and the size of the rotor
- there is sufficient direct sunlight to cause shadows (cloud, mist, fog or air pollution could limit solar energy levels)
- a turbine is directly between the sun and the affected property, and within a distance that the shadow has not diminished below perceptible levels
- there is enough wind energy to ensure that the turbine blades are moving.

Generally only properties within 130 degrees either side of north, relative to the turbines, can be affected at these latitudes in Ireland - turbines do not cast long shadows on their southern side.

4.13.4 Assessment Methodology

A shadow flicker assessment will be carried out using ReSoft Windfarm software (version 5.0.1.2) to predict the time and duration of shadow flicker on windows of habitable or permitted houses within 10 rotor diameters from a proposed turbine, as informed by the house and planning surveys.

The methodology used for the shadow flicker assessment will be performed in consideration of the "Wind Energy Development Planning Guidelines" DoEHLG (2006)[21] and the Irish Wind Energy Association (2012) "Best Practice Guidelines for the Irish Wind Energy Industry".

This methodology includes:

- Calculation of sunshine factor based on the historical measurements from the closest Met Éireann meteorology station.
- Calculation of shadow flicker levels for the final turbine layout.
- Where exceedances are predicted, detailed mitigation measures, including an outline potential turbine shutdown will be proposed.

Cumulative impacts of the proposed development and other schemes will be assessed. IWEA Best Practice Guidelines (2012, Section 6.3.4) states that "any such wind farm developments within 2 km of the proposed development should be considered in a separate cumulative shadow flicker assessment. There are no other known proposed, consented or existing wind farms within this distance of the proposed development and so it is proposed that cumulative shadow flicker be scoped out at this stage.

Based on latest draft guidelines, a demonstration of the potential for the development to comply with zero shadow flicker and a curtailment analysis to demonstrate potential downtime will also be provided.

4.13.5 Likely Significant Effects

Shadow flicker occurs where the movement of turbine blades cast moving shadows over receptors in the vicinity of the turbines. These moving shadows can periodically reduce light coming from, for example, the window of a room, causing the light to appear to flicker.

For shadow flicker to occur, a number of conditions must be reached:

- That there is a sufficient level of sunlight relative to the position and distance of the receptor to the turbine and the size of the rotor
- That the turbine is directly between the sun and the dwelling, and;
- That the blades are turning.

This assessment follows the Wind Energy Development Guidelines (2006). The guidelines state that:

'It is recommended that shadow flicker at neighbouring offices and dwellings within 500 m should not exceed 30 hours per year or 30 minutes per day.' Coolglass Wind Farm Limited will abide by this requirement.

[21] It is acknowledged that the 2006 Wind Energy Development Guidelines are currently being revised. A draft version of the replacement Wind Energy Development Guidelines (WEDGs) was published in December 2019. The consultation period has now closed, and the final version is awaiting publication.

4.14 Telecommunications and Aviation

4.14.1 Introduction

The rotating blades of a wind turbine can occasionally cause interference to electro-magnetically propagated signals. Such interference could, in theory, affect all forms of electromagnetic communications including:

- Satellite communications
- RADAR
- Cellular radio communications
- Aircraft instrument landing systems
- Air traffic control
- Terrestrial microwave links
- Television broadcasts

In addition, it is possible that houses in the immediate vicinity of the turbines could require some remedial measures in relation to television reception. The EIAR will include an assessment of any such potential impacts.

4.14.2 Baseline

In terms of the receiving environment, links will be identified within a suitable buffer distance of the turbines, following consultation with network providers.

4.14.3 Scope of Assessment

4.14.4 Assessment Methodology

An evaluation of the possible effects that the proposed development could have on aviation and existing telecommunications networks will be conducted. A study will be undertaken to analyse the impact of the turbines on telecommunications operator's point-to-point microwave radio links.

This evaluation will include the generation of GIS based telecommunications constraints mapping for the areas affected. The purpose of this mapping is to identify potential negative impacts on the telecommunications network and facilitate the selection of optimum sites and turbine locations by avoiding telecommunication links where possible, and thereby limiting any potential negative impacts on service providers in the area.

The proposed assessment methodology will include:

- Consultation with Irish Aviation Authority, Commission for the Regulation of Utilities, emergency services
- Consultation with telecommunications operators to gather the necessary data
- Preparation of constraint mapping
- Analyses of the impact of the turbines on telecommunications operators' point-to-point microwave radio links and apply appropriate buffer distances around links and masts where required
- Discussions with telecommunications operators identifying potential clashes. Operators to provide feedback on initial assessment and to provide information on the importance of the links identified.
- Further specialist investigations will be carried out if the telecommunications operators identify potential impacts.
- Where necessary, mitigation measures to be agreed with operators including:
    - Turbine relocation
    - Telecommunications link relocation

- Underground fibre optic cables to replace microwave link
- Submission of final detailed layout to telecoms operators.
- Agree any layout alterations following final detailed assessment by telecoms operators or agree suitable mitigation measures if necessary.

Impacts on aviation will be addressed following detailed discussions with the Irish Aviation Authority.

In relation to the grid connection, mapping of telecommunications cables, which could potentially be affected by the installation of the proposed grid connection, will be obtained and potential impacts assessed.

4.14.5 Likely Significant Effects

An evaluation of the possible effects that the proposed development could have on aviation and existing telecommunications networks will be conducted. A study will be undertaken to analyse the impact of the turbines on telecommunications operator's point-to-point microwave radio links.

This evaluation will include the generation of GIS based telecommunications constraints mapping for the areas affected. The purpose of this mapping is to identify potential negative impacts on the telecommunications network and facilitate the selection of optimum sites and turbine locations by avoiding telecommunication links where possible, and thereby limiting any potential negative impacts on service providers in the area.

The Irish Wind Energy Association 2012 guidelines, "Best Practice Guidelines for the Irish Wind Energy Industry", indicate that wind turbines within "20 km of a radio navigation aid" have the potential to cause electro-magnetic interference with these signals. It is possible that houses in the immediate vicinity of the turbines could require some remedial measures in relation to television reception. In practice, such measures are not difficult to implement, are relatively inexpensive and if necessary, will be undertaken by the developer in conjunction with RTÉ.

5.0 The Requirement for Natura Impact Assessment / Appropriate Assessment

5.1 Introduction

The scoping of a Natura Impact Statement (NIS) is concerned with identifying the implications for Natura 2000 sites, with respect to their conservation objectives, of **Likely** and **Significant** effects caused by the project. The effects can arise directly or indirectly from the project, or in combination with other projects.

The receiving environment, in the context of a NIS, is thus exclusively focused on possible impacts on the Natura 2000 Special Areas of Conservation and Special Protection Areas.

It should also be noted that since the purpose of the Natura 2000 sites is the conservation of habitats and species, there is considerable overlap between the NIS and the Biodiversity section of the EIAR.

The content of Section 4.6 of this document will thus also be applicable to the NIS. The current guidance for Appropriate Assessment in Ireland is contained within the document "Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities", published by the Department of the Environment Heritage and Local Government, December 2009 and revised February 2010.

The guidance states that the Natura sites to be assessed should be those within the likely zone of impact of the project. DECLG guidance advises that the potential zone of impact should be considered on a case-by-case basis and suggests that for some projects this could be as low as 100m.

In this instance, it is considered that likely and significant effects could arise from three possible sources, all of which could either directly or indirectly affect a Natura 2000 site:

- Construction Activities; and/or
- Operational Activities; and/or
- Decommissioning Activities.

6.0 Cumulative Impacts, Indirect Impacts and Interaction of Effects

6.1 Aspects to be addressed

Cumulative impact of the proposed development with other projects which are either existing, permitted, or are pending planning permission, or for which there is information in the public domain, and a sufficient level of detail to allow assessment, will be addressed. Indirect effects and effects in different environmental media will also be addressed.

The cumulative effects from the construction of the wind turbines, cabling, and hold routes alterations will also be assessed. Cumulative assessment will be assessed under each individual chapter heading.

6.2 Cumulative Assessment Methodology

The assessment methodology will be based on the EPA guidance and the EU guidelines 'Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions', published by the Office for Official Publications of the European Communities (May 1999). Cumulative impacts will also be assessed in accordance with the Scottish National Heritage guidance on 'Assessing the Cumulative Impact of Onshore Wind Energy Developments' (March 2012). Other key guidance documents used for the carrying out of cumulative impact assessment include the following:

- Draft Advice Notes on Preparing the Environmental Impact Statements (EPA 2015)
- Guidance on The Information to Be Contained in Environmental Impact Assessment Reports (EPA, 2022)
- Environmental Impact Assessment of Project Guidance on The Preparation of The Environmental Impact Assessment Report (EC, 2017)
- Guidelines For Planning Authorities and An Bord Pleanála on Carrying Out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018).

As part of scoping, the studies which are required to assess the impacts of the proposed development for each environmental discipline will identify and examine the potential for significant cumulative indirect impacts on interactions. Where the potential for significant cumulative and indirect impacts on interactions is identified, such impacts on interactions of impacts will be included in the scope and addressed in the baseline and impact assessment studies for each of the relevant environmental media and aspects of the project. The cumulative and indirect impacts in interaction of impacts will be presented in the chapters of the EIA order which addresses the most relevant environmental media.

The matrix and expert opinion approaches, as outlined in the EU guidelines will be used in the identification of the potential for significant cumulative and indirect impacts on interactions. A matrix of potential interactions will be prepared and will be found in Chapter 17 of the Coolglass EIAR.

Cumulative impacts will be assessed for other projects which are existing, permitted, pending planning permission. Projects where there is information within the public domain is sufficient level of detail to allow assessment will also be assessed.

If other projects on a similar scale and type are under construction at the same time of the proposed development, there would be a cumulative increase demand for construction materials and skills, and it would be potential for increased construction traffic dust and noise stop the proposed development has the potential to reduce Ireland's reliance on fossil fuel power generation and assist in meeting EU targets for renewable energy generation. Once operational, the cumulative effects with other wind and solar farms within the area will be a positive one due to the replacement of fossil fuel energy production with renewable green energy.

7.0 Statutory and Other Consultees

7.1 Consultees

As part of the scoping process, a number of consultees will receive a copy of this scoping report.

Consultees who are likely to be contacted and /or will be consulted with during the Scoping process have been included as Appendix 01 of this Scoping Report.

It is anticipated that An Bord Pleanála will invite a number of prescribed bodies to comment on the proposed scope and contents of the EIAR. These include, but are not limited to:

- Laois County Council
- Kilkenny County Council
- Minister for Housing, Local Government, Heritage
- Minister for Tourism, Culture, Arts, Gaeltacht, Sport and Media
- Minister for Rural and Community Development
- Department of the Environment, Climate and Communications
- Minister for Transport
- Inland Fisheries Ireland (IFI)
- Transport Infrastructure Ireland (TII)
- Environmental Protection Agency (EPA)
- The Heritage Council
- An Taisce
- An Chomhairle Ealaíon (Arts Council)
- Failte Ireland
- Health and Safety Authority
- Irish Water

A copy of this scoping report will be provided to all Prescribed Bodies issued by An Bord Pleanála upon the determination of whether this project is Strategic Infrastructure Development. An SID pre-application consultation was undertaken with An Bord Pleanála on 16th June 2022 (ref. ABP-313375-22) and remains open for further consultation, if required.

Appendix 01

List of Consultees

Scoping Consultees	
Telecommunications/ Aviation	
Irish Aviation Authority	Meteor Mobile Communications Ltd.
Telecommunications Section, An Garda Siochána	O2 Ireland
Wireless Connect Ltd.	Vodafone
Irish Broadband/Imagine	Three
Digiweb Dublin Offices and Data Centre	ESB Telecoms
Ripplecom	TETRA Ireland Ltd.
Magnet Networks	Premier Broadband
BT Communications Ireland Ltd	UPC Ireland
Dublin Airport Authority	Wireless Connect Ltd.
Commission for Communications Regulation	Irish Telecom
RTE	TowerCom Ltd.
TV3	Arra Communications
Eir	Echo IT Limited
Broadcasting Authority of Ireland	
Laois County Council	
Planning Department	Roads Department
Heritage Officer	Archaeologist
Environment Department	
Carlow County Council	
Planning Department	Roads Department
Heritage Officer	Archaeologist
Environment Department	
Kilkenny County Council	
Planning Department	Roads Department
Heritage Officer	Archaeologist
Environment Department	
Other Interested Bodies	
An Taisce	Irish Sports Council
Birdwatch Ireland	Commission for Energy Regulation
Fáilte Ireland	Geological Survey of Ireland
Teagasc	Health Service Executive
EPA	Office of Public Works
Eastern and Midland Regional Assembly	Transport Infrastructure Ireland
Irish Farmers Association	Bat Conservation Ireland
Irish Peatland Conservation Council	Irish Raptor Group

Scoping Consultees	
The Heritage Council	Gas Networks Ireland
Sustainable Energy Authority of Ireland	Iarnrod Eireann
Inland Fisheries Ireland	Irish Water
Irish Red Grouse Association	The Arts Council
National Trails Office	Transport Infrastructure Ireland
South Eastern River Basin District	Údarás na Gaeltachta
Irish Wildlife Trust	Waterways Ireland
Irish Parachute Club	NPWS Development Applications Unit
Government Departments	
Department of Communications, Climate Action and Environment	Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs – Development Applications Unit (Nature Conservation)
Department of Housing, Planning, Community and Local Government	Department of Defence
Department of Agriculture, Food and the Marine	Irish Aviation Authority
Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs – Development Applications Unit(National Monuments Service)	Department of Transport, Tourism and Sport

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