

1 INTRODUCTION

This Environmental Impact Assessment Report (EIAR) relates to a proposed wind energy project in Co. Clare, named Carrownagowan Wind Farm, for which development consent is being sought by Coillte (the applicant) from An Bord Pleanála (the competent planning authority). A full description of the proposed development and development lands of the project is provided in Chapter 2 of this EIAR.

The EIAR consists of a systematic analysis and assessment of the potential effects of the proposed project on the receiving environment. The intended purpose of the EIAR is to:

- inform decision makers and the public of the possible environmental effects and impacts associated with the implementation of the proposal,
- determine whether the identified impacts and associated effects could be significant, and
- suggest mitigation measures for potential impacts where feasible.

This chapter of the Environmental Impact Assessment Report (EIAR) sets out the background and terms of reference for the EIAR. It sets out the report structure, assessment topics, assessment authors and contributors, and their experience and qualifications, and assumptions which underlie the EIAR.

1.1 THE APPLICANT

Coillte Cuideachta Ghníomhaíochta Ainmnithe (Coillte) (the Applicant) is seeking planning permission from An Bord Pleanála (ABP) to construct and operate a wind farm project on lands at Slieve Bearnagh, Co. Clare.

Coillte is a commercial semi-state company operating in forestry, land-based businesses, renewable energy and panel products. Coillte Group is organised into the following three divisions:

- *Coillte Panel Products Division - manages two major panel product manufacturing companies;*
- *Coillte Forest Division - manages the Group's forestry business; and*
- *Coillte Land Solutions Division - manages a portfolio of assets in energy, land sales and development where the primary focus is on initiatives that are aligned to government policy. This division also includes Coillte Nature which will target the delivery of new woodlands facilitating species diversity, biodiversity and carbon sequestration as part of the Government's National Forestry Programme. The establishment of Coillte Nature will also see the conversion of certain commercial Coillte forests to recreational forests.*

Coillte has been and will continue to be a significant contributor to achieving Ireland's renewable energy objectives and targets over the next decade. Coillte is one of the largest developers of renewable energy in the State and has enabled in excess of 30% of all installed wind farms through wayleaves/rights of way and as a land supplier and developer. Coillte has identified an extensive pipeline of 1GW of new on-shore wind development and energisation on our lands by 2030 and the potential for further significant development thereafter. Coillte therefore seek to be a significant contributor to the transformation of the Energy sector in the coming decades.

1.2 THE PROJECT INCLUDING THE PROPOSED DEVELOPMENT

It is proposed that two separate planning applications will be made by Coillte to An Bord Pleanála, in respect of the proposed wind energy project as set out below:

1. Application under section 37E of the Planning and Development Act 2000, as amended, for the Carrownagowan Wind Farm, including 19 wind turbines, substation, met mast, access tracks, borrow pits, visitor cabin and works on the turbine delivery route; and
2. Application (at a later date) under section 182A of the Planning and Development Act 2000, as amended, for the Grid Connection, which consists of development comprising or for the purposes of electricity transmission - the underground cable to provide a connection to the national grid from the Carrownagowan Wind Farm.

The project, as described throughout this EIAR, includes both the proposed development, as outlined in item 1 above and the grid connection. Furthermore, replacement forestry lands, associated with the permanent felling to allow the construction of the wind farm, are also included as a project component. Details of the project which includes the proposed development are further detailed in Chapter 2.

1.3 LEGISLATIVE CONTEXT OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

The Environmental Impact Assessment (EIA) Directive (European Union Directive 2011/92/EU and the amending Directive 2014/52/EU) on the assessment of the effects of certain public and private projects on the environment, requires Member States to ensure that a competent authority carries out an assessment of the likely significant effects of certain types of projects, as listed in the Directive, prior to development consent being given for the project.

EIA provisions in Irish Law in relation to planning consents are currently contained in the Planning and Development Act, 2000, (Part X) as amended, and in Part 10 of the Planning and Development Regulations, 2001, as amended.

The proposed wind energy project, is of a prescribed class of development to which the EIA Directive applies and falls within the list of project types requiring an EIA as set out under 3(i) of Part 2 of the 5th Schedule of the Planning and Development Regulations 2001(as amended) which states ...

Installations for the harnessing of wind power for energy production (wind farms) with more than 5 turbines or having a total output greater than 5 megawatts.

The EIA Directive and Planning and Development Regulations 2001, as amended, also provide that in respect of an application for development consent where EIA is required, the developer (applicant) is required to prepare and submit an environmental impact assessment report to the competent authority.

This EIAR is compliant with the requirements of an Environmental Impact Assessment Report (EIAR) as set out in the Planning and Development Regulations 2001, as amended and as set out in the 2014

EIA Directive in terms of the structure and content of the information required to be provided by the Developer.

1.4 EIA METHODOLOGY

In terms of the EIA process, the following stages were undertaken:

- **Screening**
- **Consultation**
- **Scoping**
- **EIAR preparation** (i.e. establishing baseline data, evaluating impacts, defining mitigation measures, etc.)

1.5 SCREENING

The proposed development is an application for a wind farm development comprising 19 wind turbine generators and will have an expected output of between 90 to 110MW.

Schedule 5 (Part 2) Sub-section 3(i) of the Planning & Development Regulations 2001-2019 sets a mandatory threshold for **'Installations for the harnessing of wind power for energy production with more than 5 turbines or having a total output greater than 5 megawatts'**.

Therefore, the proposed development is over the mandatory threshold for EIA.

1.6 CONSULTATION

Extensive consultation was undertaken in relation to the project, and comments from stakeholders and interested parties were requested and highly encouraged. The following outlines the consultation process.

Consultation through, meetings, public information days, letters, email and telephone calls, with various statutory and non-statutory consultees has been maintained throughout.

1.6.1 Pre-Planning + EIAR Consultation Meetings

Consultation through meetings took place with the following parties:

- An Bord Pleanála
- Clare County Council - Planning Department
- Clare County Council - Roads Department
- Eirgrid
- National Parks and Wildlife Service (NPWS)

MWP also sought to meet with Inland Fisheries Ireland (IFI) to discuss the wind farm. However, due to a retirement and a new appointment in the region and the current postponement of meetings (March 2020, Covid-19), it was not possible to arrange same. Our engagement with IFI is described below.

1.6.1.1 An Bord Pleanála

Two pre-application meetings were held with the Board. The first meeting was held on February 11th, 2019, where Coillte and Malachy Walsh and Partners introduced the Carrownagowan proposal, a project with between 20 and 25 wind turbines. The grid connection, NIS and EIAR were discussed. The Board stressed the importance of public consultation and recommended a robust visual assessment.

A second meeting was held with the Board on August 8th, 2019. At the second meeting, the discussion focused on the hen harrier, bats and other biodiversity, along with the visual impact and the haul route for turbine delivery. The EIAR and the NIS were also discussed and the Board advised they would be providing the list of statutory bodies once the pre-application stage was closed.

The Board confirmed the project would be Strategic Infrastructure in correspondence dated the 4th of November 2019 and advised on the list of prescribed bodies.

1.6.1.2 Local Authority – Clare County Council

Coillte held a meeting with members of Clare County Council Planning Department on July 28, 2015. This was a preliminary meeting to introduce the site and discuss its suitability for a wind farm project. At the meeting, it was confirmed that the location is mainly within a “strategic area” for wind farm development, with a small portion within the “open to consideration” areas.

Coillte and Malachy Walsh and Partners attended a meeting with Clare County Council Planning Department on October 9th, 2018. The new project scope was explained, having turbines located predominantly within the area zoned strategic for wind. Clare County Council stated it was important to protect views from the east and northeast, with a particular focus on Lough Derg and Killaloe. Coillte and Malachy Walsh and Partners attended a second meeting with Clare County Council Planning Department on August 14th, 2019. The visual impact was again discussed with a discussion on the impact from the west.

Coillte met with the Roads Department of Clare County Council on on January 30th, 2019 and on January 28th, 2020. The route of the grid connection was discussed and the widening of local roads on the approach to the wind farm site was also discussed.

1.6.1.3 EIRGRID

Coillte held a preliminary meeting with Eirgrid and TLI (project team grid specialist) to discuss the on site substation and the grid route. All designs are to current Eirgrid specifications.

1.6.1.4 National Parks and Wildlife Service (NPWS)

A meeting was held with the NPWS on February 12th, 2020 in Galway. The discussion included biodiversity at the site, water quality and the use of the site and surrounds by the hen harrier, particularly for foraging. There was also a discussion on the use of native planting along the site roads to improve diversity of species on the site.

During the EIA process, MWP applied for and were issued a licence (No. C115/2017) from NPWS to carry out freshwater pearl mussel (FPM) *Margaritifera margaritifera* survey work in the study area.

1.6.1.5 Inland Fisheries Ireland (IFI)

Electrical fishing assessments were carried out at selected sites under authorisation from the Department of Communication, Energy and Natural Resources under Section 14 of the Fisheries Act (1980).

MWP sought to meet with the IFI to discuss measures for the construction of the wind farm project and also to discuss biodiversity enhancement measures. The construction measures include design mitigation to avoid impacts on watercourses and the enhancement measures represent opportunities for biodiversity improvement as a positive recommendation only and are not a requirement of mitigation or compensation. However, due to a retirement and a new appointment in the region and the current postponement of meetings (March 2020, Covid-19), it was not possible to arrange same.

Correspondence was received from the IFI on February 26th, 2020 which included a detailed response in the absence of a project meeting or discussion on the assessments and design (Volume III, Appendix 1-3). IFI's main concerns are in relation to the protection of the aquatic resource and the associated riparian habitat. Water protection is a key design feature of the project and improvement of the riparian habitat is included in the Biodiversity Enhancement Measures (Volume III, Appendix 6-10). A buffer of 75m was applied to watercourses for the siting of turbines and hardstands. Clear span arches are proposed where required for crossings. The data gathered as part of the soil and peat assessments has been used to complete the design including all the drainage, which is designed to disperse water from settlement ponds overland. There is no constructed connectivity between drainage and natural watercourses.

1.6.1.6 Written Consultations

Written notifications were circulated to a number of identified stakeholders (both statutory and non-statutory consultees) in December 2018, which set out an overview of the project proposal. The notifications invited feedback from the Consultee on any key issues and concerns which they consider should be addressed and expressed that their input at this stage would be welcomed. Consultees were informed that participation at this stage of the project would not affect participation at a later stage in the planning process. A list of the organisations/groups consulted, a copy of the consultation document and the responses received are provided in Volume III Appendix 1 of this EIAR. The issues raised were subsequently taken into account in the EIA process. A summary of the responses and feedback received are provided in Table 1.1.

Table 1-1 Consultees and Summary of Responses to Consultation Letter

Organisation	Summary of Response/ Comments
BT Ireland	The planned development will have no impact on the BT Ireland microwave radio network.
Clare Walks Ltd	Proximity of the East Clare Way walking trail
Department of Agriculture, Food and the Marine	The EIAR/NIS should include assessment of the impact of and measures to prevent mitigate or compensate for any significant adverse effects direct or indirect identified on the environment arising from felling and replanting of trees, deforestation for the purposes of conversion to another type of land use or replacement of broadleaf high forest by conifer species.
Failte Ireland	Consideration of Failte Ireland's Guidelines for the treatment of tourism in an EIS
Friends of the Earth	Seeking information on community participation and information events
Geological Survey of Ireland	<ul style="list-style-type: none"> • There are no CGSs located within the vicinity of the site. With the current plans, there is no envisaged impact on the integrity of County Geological Sites by the proposed developments. • Should any significant bedrock cuttings be created, we would ask that they will be designed to remain visible as rock exposure rather than covered with soil and vegetated, in accordance with safety guidelines and engineering constraints, for ongoing improvement of geological knowledge.
TII	<ol style="list-style-type: none"> 1. The EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network in order to demonstrate that the development can proceed complementary to safeguarding the capacity, safety and operational efficiency of that network. 2. Consultations should be had with the relevant Local Authority/National Roads Design Office 3. Cabling and potential connection routing: <ol style="list-style-type: none"> (i) note locations of existing and future National road scheme to safeguard proposed road schemes. (ii) Alternatives to the provision of cabling along the national road network eg alternative routing in private lands should be considered (iii) All existing TII infrastructure should be protected (iv) Separate approvals may be required for works traversing the National Road Network. 4. Clearly identify haul routes and fully assess the network to be traversed. All structures on the haul route should be checked to confirm their capacity to accommodate any abnormal load proposed. 5. Traffic and Transport Assessment 6. Check requirement for Road Safety Audit and Road Safety Impact Assessment. 7. The EIAR should consider the Environmental Noise Regulations.
Tipperary County Council Planning Department	The visual impact assessment should consider the impact on the Primary Amenity Area in Co. Tipperary.
Irish Aviation Authority	Study required to ensure WF does not adversely affect flight check profiles
	Request to liaise with IAA-ANSP Engineering to confirm no impact on communication, navigation and surveillance aids for Shannon Airport or for impact to en route operations.
Inland Fisheries Ireland	Owenogarney River important for salmon and trout spawning and the Annacarriga River for trout spawning. Also mentioned a peatslide and a resultant fish kill.
Netshare	There appears to be no impact to Vodafone services in this area.

1.6.1.7 Community Engagement and Public Consultation

From the project outset, Coillte consulted with the local community and commenced this engagement prior to the start of the project design and environmental assessment, with the objective being to ensure that the views and concerns of all members of the local community were considered as part of the project design and the Environmental Impact Assessment process.

The key elements of this approach, is referred to as Coillte's 'Fair Play' model, which is outlined within the Community Report (**Volume III, Appendix 5-1 for the Community Report**).

Coillte also established a project website (www.carrownagowanwindfarm.ie) to provide information throughout the EIA process. As an Open Evening was not an option due to COVID-19 public health restrictions, Coillte organised a virtual reality open event accessible on the project website. Full details surrounding engagement with the community and the public are outlined in the Community Report in Volume III of this EIAR.

1.6.2 Scoping (i.e. determining the issues that the EIAR should address);

Scoping is an integral part of the preparation of an EIAR. This EIAR is prepared on the basis of a study of the possible environmental effects should the project be realised. The areas identified for assessment and inclusion in the report were determined from:

- Preliminary environmental appraisal and project feasibility involving desk-top studies, review of available data for the general area of the site, site visits and field surveys;
- Preliminary consultations between Clare County Council and the Applicant;
- The Clare County Development Plan and Clare Wind Energy Strategy;
- EPA publication 'Guidelines on Information to be contained in environmental impact statements', 2002 and 'Guidelines on Information to be contained in environmental impact assessment reports', Draft August 2017;
- Project Type 33 (Installations for the harnessing of wind power for energy production (wind farms) of EPA publication 'Advice Notes on Current Practice (in the preparation of Environmental Impact Statement), 2003 and Advice Notes for Preparing Environmental Impact Statements Draft September 2015;
- Directive 2014/52/EU amending Directive 2011/92/EU on the effects of certain public and private projects on the environment (the EIA Directive);
- EIA Regulations 2018, ie. S.I. No. 296 of 2018 - European Union (Planning and Development)(Environmental Impact Assessment) Regulations 2018;
- Planning and Development Act, 2000, (Part X) as amended, and in Part 10 of the Planning and Development Regulations, 2001, as amended;
- Department of Agriculture Food and the Marine, Forest Service Guidelines;
- The Irish Wind Energy Association, Best Practice Guidelines for The Irish Wind Energy Industry, 2012;
- The Department of Environment, Heritage and Local Government, Wind Farm Planning Guidelines 2006;
- Scoping checklist set out in the European Commission's guidance document on EIA scoping (2017);

- Feedback from Statutory and Non-Statutory Consultations; and
- The experience of the project team.

The Scoping Checklist is included as Appendix 1-4 in Volume III of the EIAR.

A draft of the revised Wind Energy Development Guidelines (WEDG) was published for consultation in December 2019 and the final WEDG will be published by the Department in due course. At the time of submission of the application, the 2006 Wind Energy Development Guidelines remain the relevant guidelines, for the purposes of section 28 of the Planning and Development Act 2000, as amended. Should the revised WEDG be adopted in advance of a planning decision being made on the Carrownagowan Wind Farm, with current noise and shadow flicker thresholds being amended, the project is capable of compliance with further operational controls in place. Further detail on this is provided in the relevant chapters of this EIAR.

Based on all EIA scoping activities outlined above, the following specific issues have been identified for assessment and inclusion in the EIAR.

Table 1.2 outlines the specific issues that have been identified for assessment and inclusion in the EIAR, the chapters of the EIAR where these study areas have been addressed and the relationship between EIAR chapters and those stipulated by the Regulations.

Table 1-2 Relationship between selected EIA Study Areas, EIAR Chapters and Regulated Study Area

Regulated Study Area	Assessment and Studies included in the EIAR	EIAR Chapter
Population and Human Health	Residential Amenity (noise, traffic, air quality, visual effects, shadow flicker)	Chapters 5, 9, 10, 11, 12 & 14
	Health and Safety	
Biodiversity	Habitat disruption	Chapter 6
	Protected Flora and Fauna	
	Bat populations	
	Aquatic Ecology	
	Avian populations	Chapter 7
Water	Impacts on Surface Water Quality	Chapter 8
	Impacts on Groundwater Quality	
	Impacts on Groundwater Levels and Local Well Supplies	
	Flood risk Assessment including the potential for the proposed development to be affected by flooding and the potential for the development to increase flood risk elsewhere	
	Hydrological impacts on designated sites	
Land and Soil	Loss of land use	Chapter 9

Regulated Study Area	Assessment and Studies included in the EIAR	EIAR Chapter
	Excavated materials	
	Peat Stability	
	Forestry replanting	
	Contamination of soil	
	Soil Erosion	
Air and Climate	Emissions to atmosphere and affect on Air Quality	Chapter 14
	Impact of the project on climate	
	Vulnerability of the project to climate change	
Noise	Noise & Vibration Emissions	Chapter 10
Landscape	Visual Impact of new structures	Chapter 12
	Impact on landscape character	
Cultural Heritage	Impact to archaeological (known and unknown) and cultural heritage resources	Chapter 13
Material Assets	Roads, infrastructure, utilities, traffic.	Chapter 15
	Forestry Resources	Chapter 15
	Telecommunications, Television, Aviation	Chapter 15

1.7 EIA STUDY AREA

It is to be noted that the EIA project area differs to that of the proposed development site as presented within the planning application statutory drawings. Figure 1.1 shows the proposed development site per the planning application statutory drawings.

Figures 1.2 – 1.5 show the minimum extent of the lands considered as part of the environmental assessment. The EIA however takes account of the spatial limits of individual environmental components outside the EIA Project Area boundaries where an effect can be reasonably expected as described in the individual chapters.

Figure 1-1 Planning Application Area

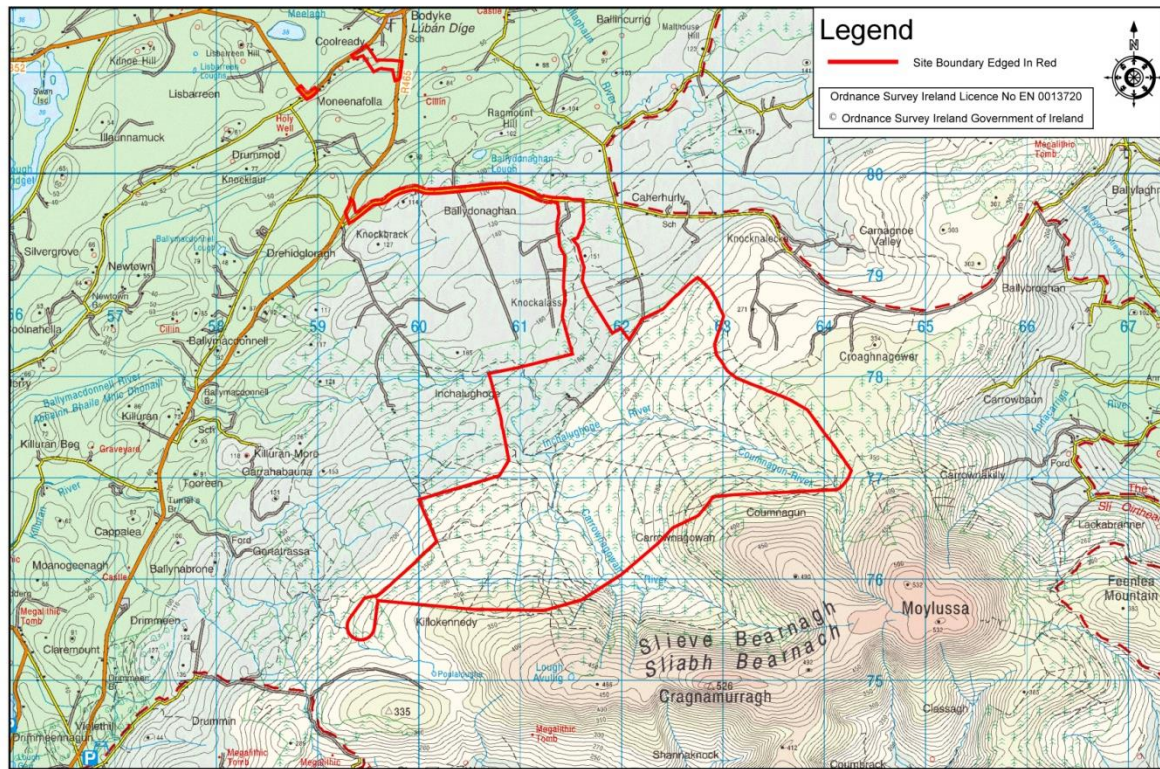


Figure 1-2 EIA Project Area

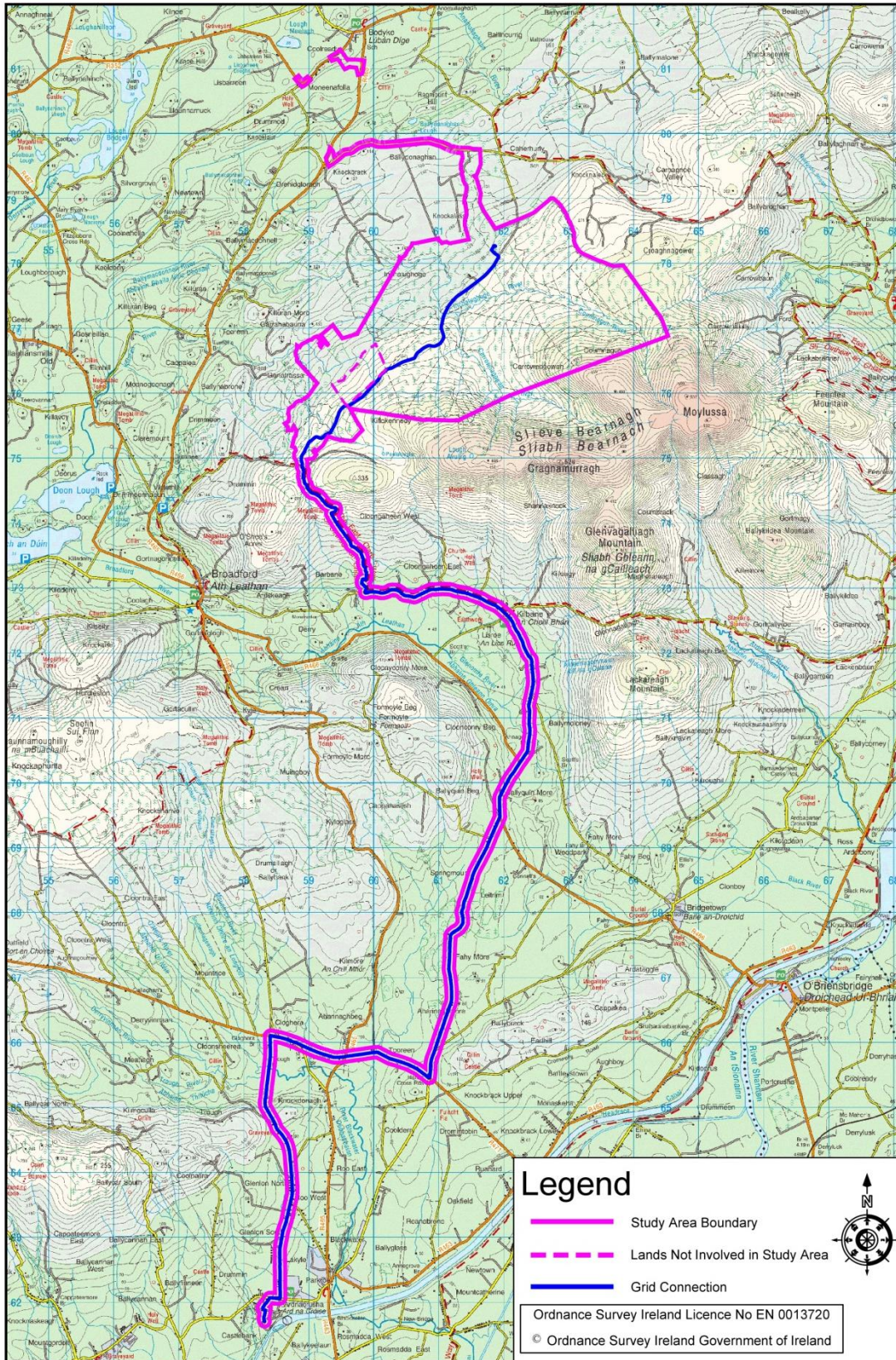


Figure 1-3 Replacement lands at Ballard, Co. Wicklow

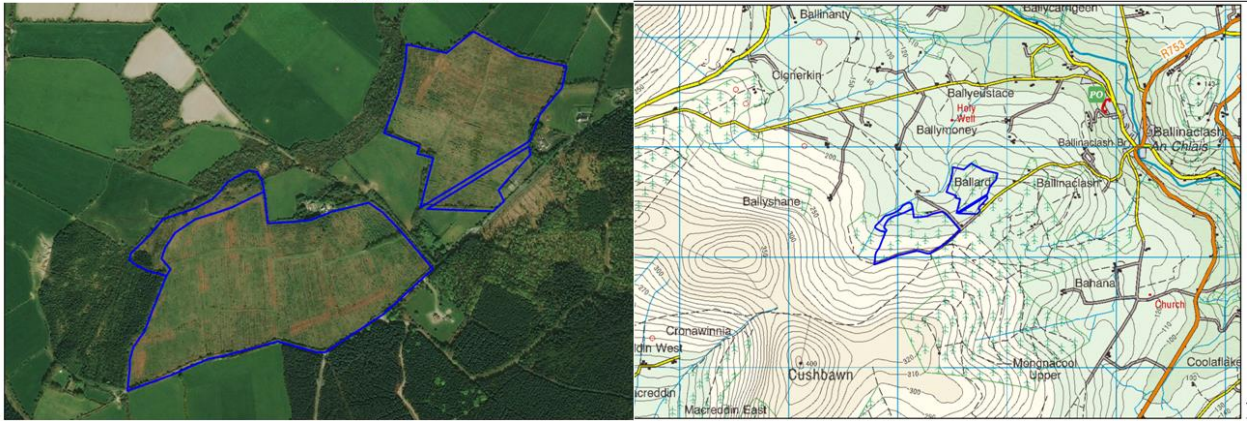


Figure 1-4 Replacement lands at Dangananella West, Cooraclare, Co. Clare

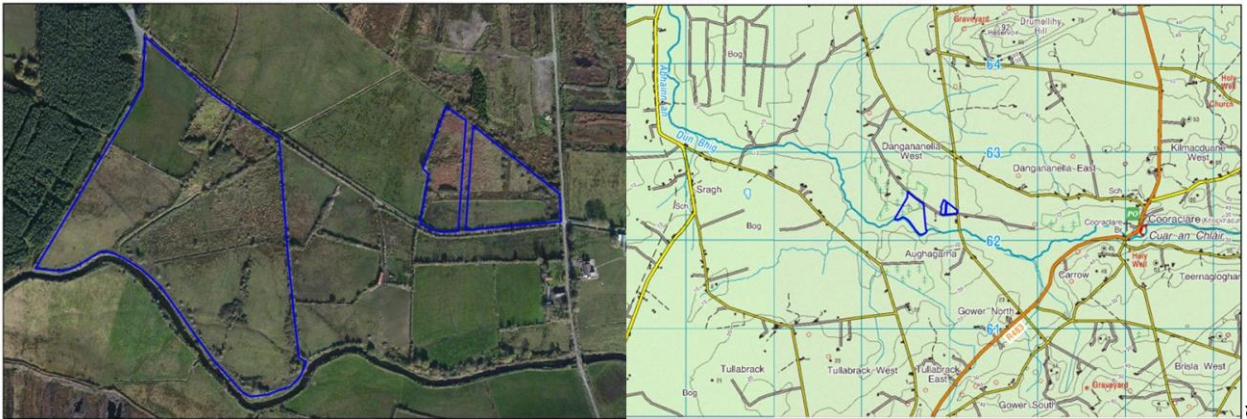


Figure 1-5 Replacement lands at Trillickacurry, Co. Longford



1.8 OVERVIEW OF EIAR STRUCTURE

This document has been prepared in accordance with the requirements of the Planning and Development Regulations 2001 as amended, the EIA Directive as amended by Directive 2014/52/EU; and guidelines provided by the Environmental Protection Agency (EPA) - '*Guidelines on information to be contained in an environmental impact statement*', 2002 and draft '*Guidelines on Information to be contained in environmental impact assessment reports*', August 2017). Regard was also had to the 2017 European Commission Guidance on the Preparation of the Environmental Impact Assessment Report.

The EIAR is presented in 4 No. Volumes as follows;

- Volume I: Non-Technical Summary
- Volume II: Main Environmental Report
- Volume III: Appendices
- Volume IV: Photomontages

1.8.1 Volume I - NON-TECHNICAL SUMMARY

The Non-Technical Summary provides an easy-to-follow and understandable summary of the information included in the EIAR. The summary is presented similar to the grouped format structure which discusses each environmental topic separately.

1.8.2 Volume II - MAIN EIAR

This document provides a detailed description of the proposed project and contains specialist reports on each of the selected assessment topics. This document is prepared in the 'Grouped Format Structure' which examines each environmental topic area. Biodiversity is included across two chapters. This structure was selected for the Main EIAR as it facilitates straightforward investigation of individual topics. This document is divided as follows:

- Chapter 1 Introduction
- Chapter 2 Description of the Proposed Development
- Chapter 3 Civil Engineering
- Chapter 4 Alternatives
- Chapters 5 Population and Human Health
- Chapter 6 Biodiversity
- Chapter 7 Ornithology
- Chapter 8 Water
- Chapter 9 Land and Soil
- Chapter 10 Noise and Vibration
- Chapter 11 Shadow Flicker
- Chapter 12 Landscape
- Chapter 13 Cultural Heritage
- Chapter 14 Air and Climate
- Chapter 15 Material Assets
- Chapter 16 Interaction of the Foregoing
- Chapter 17 Schedule of Environmental Mitigation

1.8.3 Volume III - APPENDICES

The Appendices volume contains supporting information and reference documents to Chapters 1-15 of the main EIAR Volume 2.

1.8.4 Volume IV - PHOTOMONTAGES

This contains the photomontages prepared for the visualisation of the proposed development from the selected viewpoint locations.

1.9 PROJECT TEAM

Malachy Walsh and Partners were the lead Environmental and Engineering Consultants on this project and the final EIAR has been compiled by Malachy Walsh and Partners on behalf of the Applicant.

The project team included a combination of competent engineering and environmental experts. The team of specialists involved in the project engineering design are presented in **Table 1.3**. Contributing authors to the environmental impact assessment report (EIAR) are presented in **Table 1.4**. Qualifications and competencies of the contributing authors to the EIAR are presented in **Table 1.5**. Chapter 6 Biodiversity, Chapter 7 Ornithology, the Screening for Appropriate Assessment, and the Natura Impact Statement, were the subject of a peer review by Dr. Tom Gittings, whose qualifications and competencies are set out in **Table 1.6**.

Table 1-3 Project Engineering Design Team

Company	Role
Coillte	Site selection
	Wind Resource Analysis
	Community Engagement
Malachy Walsh and Partners	Project Management, Design Engineering, EIA and Planning lead
TLI	Grid Connection: Route Selection, Assessment and Design

Table 1-4: EIAR Authors and Specialist Contributors

Subject Area	Author/ Contributor	Company
Description of Development	Caitriona Fox –Environmental Consultant	Malachy Walsh and Partners
	Paul Nealon– Civil Engineer	Malachy Walsh and Partners
Civil Engineering	Cormac Murphy – Civil & Geotechnical Engineer	Malachy Walsh and Partners
	Paul Nealon– Civil Engineer	Malachy Walsh and Partners
	Eoin Doyle – Civil & Environmental Engineer	Malachy Walsh and Partners
	Paddy Curran – Civil Engineer	Malachy Walsh and Partners
	Sean Doyle – Civil Engineer	Malachy Walsh and Partners
Main Alternatives	Helen Burman-Roy – Environmental Consultant	Malachy Walsh and Partners
Population and Human Health	Caitriona Fox – Environmental Consultant	Malachy Walsh and Partners
Biodiversity - Terrestrial Ecology - Appropriate Assessment	Muiread Kelly – Ecologist	Malachy Walsh and Partners
	Pat Ryan – Ecologist	Malachy Walsh and Partners
	Caoimhin O’Neill - Ecologist	Malachy Walsh and Partners
	Ger Hayes – Senior Aquatic Ecologist	Malachy Walsh and Partners
	Hazel Dalton – Ecologist	Malachy Walsh and Partners
Ornithology	Monica Kane – Senior Ecologist	Malachy Walsh and Partners
	Caoimhin O’Neill - Ecologist	Malachy Walsh and Partners
	John Murphy – Ornithologist	Malachy Walsh and Partners
Lands and Soils	Michael Gill – Environmental Engineer/ Hydro-geologist	Hydro-Environmental Services (HES)
	David Broderick – Hydro-geologist	
Water	Michael Gill – Environmental Engineer/ Hydro-geologist	Hydro-Environmental Services (HES)
	Adam Keegan – Hydro-geologist	
Air and Climate Change	Peter Barry - Environmental Consultant	Malachy Walsh and Partners
	Caitriona Fox - Environmental Consultant	Malachy Walsh and Partners
Noise	Peter Barry - Environmental Consultant	Malachy Walsh and Partners

Subject Area	Author/ Contributor	Company
Landscape	Evelyn Sikora – Senior Landscape Planner	Cunnane Stratton Reynolds
	John Flanagan – Visualisation Expert	Innovision
Cultural Heritage	Grace Corbett – Senior Archaeological Consultant	IAC Ltd.
Material Assets	Caitriona Fox – Environmental Consultant	Malachy Walsh and Partners
Traffic and Transportation	Seamus Quigley – Traffic Engineer	Malachy Walsh and Partners
	Karen Concannon – Traffic Engineer	Malachy Walsh and Partners
Shadow Flicker	Jeremy King – GIS & AutoCAD technician	Malachy Walsh and Partners
	Peter Barry – Environmental Consultant	Malachy Walsh and Partners
Interaction of the foregoing	Helen Burman-Roy – Environmental Consultant	Malachy Walsh and Partners
Schedule of Environmental Mitigation	Caitriona Fox – Environmental Consultant	Malachy Walsh and Partners

Table 1-5. Qualifications and competencies of EIAR Authors and Specialist Contributors

Author/Contributors	Qualifications	Competencies
Helen Burman-Roy	BSc, MSc, PIEMA Environmental Consultant	Helen is a Senior Environmental Consultant with 20 years commercial experience gained in both the US and Ireland. She is an environmental impact assessment project manager and practitioner having managed and been a contributing author on numerous project EIAs including Lettercraffroe, Toberatooreen, Scartaglen and Beennaspuck wind farm projects. She also has health and safety expertise. Helen has authored numerous specialist reports including: land, soils and geology, human beings impact and material assets assessments for project EIAs.
Caitriona Fox	BA, MSc Environmental Consultant	Caitriona is a Senior Environmental Consultant with 20 years environmental consultancy experience. She is an environmental impact assessment practitioner and has taken on the role of EIA Project Manager for a variety of large scale EIA projects including wind farms such as Knockranny/Cnoc Raithní Wind Farm and Leanamore Wind Farm. She has extensive experience in the management and compilation of environmental reports and has authored numerous specialist reports including: air and climate impact assessments, human beings impact assessment landscape impacts assessment, and material assets assessment for project EIAs.
Paul Nealon	BE (Hons) CEng MIEI Civil and Project Engineer	Paul is a Civil and Project Engineer with over 8 years of wide ranging experience in designing wind farm projects at planning and construction stage. He has been responsible for the design of infrastructure on a number of wind farm projects such as Cluddaun WF, Kilathmoy WF, Sliabh Bawn WF and Tullahennel WF

Author/Contributors	Qualifications	Competencies
Cormac Murphy	<p>BE MIEI Civil and Project Engineer</p>	<p>Cormac is a senior engineer with wide ranging experience in Civil Engineering, from site assessment through to design, tendering, site supervision and inspection. Cormac has specialised in wind farm design and construction with particular emphasis on Peat Stability Assessment and constructability of infrastructure in the peat environment. He has been responsible for the assessment and design of infrastructure on a number of wind farm projects in difficult peat conditions. These have included Tullahennel Wind farm, Co. Kerry, Tievenameenta Wind Farm, Co. Tyrone; Booltiagh Wind Farm Co Clare, Hollyford Wind Farm, Co Tipperary; Ugool and Knockranny, Co Galway; Letteragh, Co Clare. Cormac’s extensive experience in construction resulted in his engagement as the Technical Advisor on the construction of several large Wind Farms including Coomacheo and Curragh Wind Farms, Co. Cork, Athea and Dromada Wind Farms, Co. Limerick</p>
Eoin Doyle	<p>BE MSc DIC MIEI Civil & Environmental Engineer</p>	<p>Eoin is a Civil Engineer with over 6 years consultancy experience. Eoin has specialised in wind farm design and construction. He has been responsible for the assessment and design of infrastructure on a number of wind farm projects in upland sites. These have included Meenadreen WF, Cluddaun WF, Cordal WF and Tievenameenta WF.</p>
Paddy Curran	<p>BE, MSc, DipPM, CEng, MICE, RoGEP Geotechnical Engineer</p>	<p>Paddy is a Senior Engineer and has over 9 years experience in civil engineering, particularly in the area of Geotechnical Engineering. Project experience includes delivering the geotechnical investigation/interpretation, design and construction support for Tullabrack Wind Farm and Derryadd Windfarm EIS.</p>
Sean Doyle	<p>BE CEng MIEI Civil Engineer</p>	<p>Sean Doyle is an Associate Director with Malachy Walsh and Partners with particular responsibility for road design and infrastructural projects. He has worked on many civil engineering projects for Malachy Walsh and Partners including road schemes, bridges, drainage schemes and hydrological assessments. He has also worked on the civil engineering aspects of a number of wind farms and in particular the access road design, drainage and environmental mitigation measures. Sean has experience in traffic analysis.</p>
Muiread Kelly	<p>MSc BSc PGDip Ecologist</p>	<p>Muiread is a Senior Ecologist with 7 years consultancy experience of undertaking and contributing to EIAR, EclA and AA for a variety of projects including renewable energy. She has also been involved in the ongoing bird survey monitoring for the Galway Wind Park.</p>
Monica Kane	<p>MSc BSc Senior Ecologist</p>	<p>Monica has over 15 years’ experience working in environmental consultancy. She is experienced in ecological impact assessment and the appropriate assessment process. She has completed numerous EIAR chapters and Natura Impact Statements, as well as other forms of ecological assessments, for a variety of projects. She was the principal author of the guidance “Development of Bulk Energy Storage and Natura 2000” for the EU stoRE Project.</p>
Caoimhín O’Neill	<p>BSc Ecologist</p>	<p>Caoimhin is an ecologist with Malachy Walsh and Partners since 2012. He has filled the role of Environmental Manager on multiple construction projects, including numerous windfarm developments, supervising daily construction activities on site and ensuring Environmental Planning Compliance. His skills include an extensive knowledge of field survey techniques and methodology, invasive species identification/management,</p>

Author/Contributors	Qualifications	Competencies
		ornithological surveys, mitigation design, water quality assessment, Appropriate Assessment and Ecological Impact Assessment. He is experienced in a range of field surveys techniques and methodologies for birds, invertebrates (aquatic and terrestrial) and mammals such as badger, otter and bats. Caoimhin has conducted a number of pre-construction bat roost and bat activity surveys for projects such as existing/proposed wind farm and existing bridges. He is also experienced at habitat surveys. He has completed reports informing Appropriate Assessments, Stages 1 and 2, and EclAs for a wide variety of projects.
Pat Ryan	BSc Ecologist	Pat has been working as a staff ecologist with Malachy Walsh and Partners since 2010 During that time he has acquired extensive experience in the completion of Appropriate Assessment Stages 1 and 2. Projects assessed have covered a broad range in terms of size and complexity and have included a diverse range of sensitive habitats and species. He is widely experienced in the standard field survey methodologies including those for birds, ground mammals, bats and invertebrates. He has conducted a significant number of preliminary bat roost and bat activity surveys He is also widely experienced in habitat surveys and mapping techniques at both broad and fine scales across the range of habitat types.
Gerard Hayes	BSc, MIEEM, FBA Aquatic Ecologist	Gerard Hayes is a Senior Aquatic Ecologist with over 13 years' experience in environmental consultancy. He is a member of the Chartered Institute of Ecology and Environmental Management (MCIEEM) and the Freshwater Biological Association (FBA). Gerard has a diverse ecological profile, with Phase 1 habitat, tree, mammal (including bats), fish, bird, amphibian, macroinvertebrate survey experience. He has had numerous responsibilities including report writing (EIAR, EIA, EA, AA, NIS) waste assimilation capacity assessment and ecological monitoring. His area of expertise covers the infrastructure projects ranging from wind energy development, waste-water treatment, roads/bridges, water supply, flood defense and hydroelectric schemes. He is co-author and/or carried out surveys for NPWS Irish Wildlife Manual Nos. 15, 24, 26, 37, 45. As part of his experience and continuing professional development, Gerard has developed excellent analytical and GIS skills.
Hazel Dalton	BBUS, BSc Ecologist	Hazel is an Ecologist with Malachy Walsh and Partners and has completed numerous reports informing Stage 1 and Stage 2 Appropriate Assessments and Ecological Impact Assessments (EclA). She has experience with general ecological report writing and has authored several ornithological reports for large scale projects. Hazel has experience in standard field survey methodologies including, in particular, those for birds and bats, having been involved in field surveys for several large-scale projects. She is also experienced in mammal and invertebrate surveying, freshwater ecology and habitat mapping.
John Murphy	Lead Ornithologist	John Murphy is an ornithologist, wildlife expert and wildlife documentary maker. He has been working in the field of ornithology and ecology since 1982. He has extensive knowledge of the landscape and in particularly bird populations in this country. He collaborates regularly with NPWS on different projects throughout the country. John has been working as part

Author/Contributors	Qualifications	Competencies
		<p>of the MWP Environmental and ecology team on a variety of upland wind farm projects in the west and south west of the country since 2010. John is one of the country's foremost ornithologists and is a licensed bird ringer. He has always had an interest in wildlife photography and his work has been published in many magazines and books. As a 'Heritage in the Schools Specialist', he has travelled the country lecturing in schools and colleges, and to various clubs and organizations. He was the Biodiversity Officer with Clare County Council. He spends as much time in the field as possible, observing the wide range of biodiversity that Ireland has to offer.</p>
Michael Gill	<p>BA, BAI, Dip Geol., MSc, P. Geo, MIEI</p> <p>Civil Environmental Engineer / Hydrogeologist</p>	<p>Michael is an Environmental Engineer with over 18 years' environmental consultancy experience in Ireland. Michael has completed numerous hydrological and hydrogeological impact assessments of wind farms in Ireland. He has also managed EIAR assessments for infrastructure projects and private residential and commercial developments. In addition, he has substantial experience in wastewater engineering and site suitability assessments, contaminated land investigation and assessment, wetland hydrology/hydrogeology, water resource assessments, surface water drainage design and SUDs design, and surface water/groundwater interactions. For example, Michael has worked on the EIS for Oweninny WF, Cloncreen WF, and Yellow River WF, and over 100 other wind farm related projects across the country.</p>
Adam Keegan	<p>BSc., MSc, MCIWEM</p> <p>Hydrogeologist</p>	<p>Adam Keegan (B.Sc., M.Sc.,) is a hydrogeologist with two years of experience in the environmental sector in Ireland. Adam has been involved in Environmental Impact Assessment Reports (EIARs) for numerous projects including wind farms, grid connections, quarries and small housing developments. Adam holds an MSc in Hydrogeology and Water Resource Management. Adam has worked on several wind farm EIAR projects, including Croagh WF, Lyrenacarriga WF (SID), Cleanrath WF, and Fossy WF.</p>
David Broderick	<p>BSc, H.Dip Env Eng, MSc</p> <p>Hydrogeologist</p>	<p>David Broderick is a hydrogeologist with over 13 years' experience in both the public and private sectors. Having spent two years working in the Geological Survey of Ireland working mainly on groundwater and source protection studies David moved into the private sector. David has a strong background in geology and groundwater resource assessment and geological /hydrogeological/hydrological investigations in relation to developments such as quarries and wind farms. David has completed numerous geological and water sections for input into EIARs for a range of commercial developments.</p>
Peter Barry	<p>B.Sc. M.Sc. AIEMA, AIOA</p> <p>Environmental Consultant</p>	<p>Peter is an environmental scientist and environmental impact assessment practitioner with 20 years' experience in the measurement, assessment, prediction and control of environmental noise. Peter is a member of the Institute of Acoustics (IOA) and has completed the IOA Diploma in Acoustics and Noise Control.</p> <p>Peter has prepared numerous noise impact assessment reports for various developments including major infrastructural developments, mixed use developments and wind energy development projects. He has presented evidence as expert witness on noise at oral hearings including a strategic infrastructure development (SID) wind farm development. Peter</p>

Author/Contributors	Qualifications	Competencies
		has prepared numerous technical chapters for Wind Farm developments including Noise and Vibration, Shadow Flicker and Air Quality and Climate. Peter has presented evidence on all three topics as expert witness at Oral Hearing.
Evelyn Sikora	BA, MA Senior Landscape Planner	Evelyn is a qualified landscape architect and town planner. She is also a Corporate Member of the Irish Landscape Institute. She has specialised in Landscape and Visual Assessment (LVIA) and has five years' experience in a range of projects, including Strategic Infrastructure Projects throughout Ireland. Projects include a number of infrastructural projects including numerous wind farms, solar farms, road schemes, flood relief projects, and other infrastructural projects in both rural and urban contexts.
John Flanagan	BSc Visualisation Consultant	John is a visualisation consultant with over 12 years' experience providing photomontage and mapping services to the planning industry. Throughout his career, John has worked on many different projects including wind farms, solar farms, road schemes, bridges, power-lines and numerous other engineering and architectural developments. John has worked on numerous projects in Galway including Lettercraffroe Wind Farm, Knockranny Wind Farm & Ugool Wind Farm.
Grace Corbett	BA, MA, MCIfA Senior Archaeological Consultant (IAC Ltd)	Grace holds an MA in Landscape Archaeology from the University of Sheffield and a BA in Archaeology and Classics from the University College Cork. She is also a member of the Chartered Institute for Archaeologists and has over 15 years' experience working in the commercial archaeological sector, both in Ireland and the U.K. Grace has an in-depth understanding of the legislative and planning frameworks governing heritage in Ireland and specialises in the production and delivery of archaeological and built heritage desktop assessments, EIAR, master plans, and management plans across all sectors of development.
Seamus Quigley	BE, CEng, MIEI, CIHT	Seamus has extensive experience in Transport planning and traffic engineering projects, including Traffic Impact Assessments, Traffic Management Studies, Mobility Management Plans Traffic Modelling Studies, Feasibility Studies and Road Safety Audits. He is a Chartered Engineer and also a chartered member of the Institution of Highways and Transportation. He joined Malachy Walsh and Partners in 2007, having spent sixteen years with WS Atkins.
Karen Concannon	BE, MSc, CEng, MIEI	Karen Concannon has 7 years experience in traffic engineering projects, traffic management studies, feasibility studies and road safety audits. She is a Chartered Engineer with Engineers Ireland and joined Malachy Walsh and Partners in 2019, after 6 years with AECOM.
Jeremy King	Cert IA, Cert CAD, HDip AutoCaD & GIS Technician	Jeremy is the lead GIS technician in MWP and assists the environmental team in completing EIA's, EIS's, wind farm feasibility studies and planning applications. He also works alongside the wind farm civils design team, particularly in constraint mapping and collating and generating GIS baseline data that ultimately influences design and layout. Jeremy works with the EIA team specialists. He has expertise in WINDFARM design software that includes modules on wind farm layout, Photomontages, ZVI and Shadow Flicker. He has generated shadow flicker models on numerous wind farm projects.

Table 1-6. Qualifications and competencies of Peer Reviewer

Peer Review	Qualifications	Competencies
Dr. Tom Gittings	PhD CIEEM <u>Peer Review:</u> Ornithology Biodiversity AA/NIS	Dr. Tom Gittings is an independent ecological consultant. Dr Gittings. He has over 18 years’ experience as a professional ecologist and is a full member of the Chartered Institute of Ecology and Environmental Management. Tom completed his PhD in Entomology in 1994. From 1995-2001 Tom worked for the RPS Group environmental consultancy, as an Ecological Consultant (1995-1998), Associate Ecologist/Office Manager (1998-2000) and Technical Director (2000-2001). From 2001-2009, Tom carried out research into forest and wetland biodiversity in University College Cork. During this period, Tom also developed a portfolio of independent consultancy work, and, since 2010, he has worked as a full-time independent consultant.

1.10 TECHNICAL DIFFICULTIES AND AVAILABILITY OF DATA

There were no difficulties encountered in the preparation of this EIAR. As is standard practice best available predictive modelling techniques used were relevant to inform the assessment.

1.11 NOTE ON DRAWINGS AND GRAPHICS

Details of the proposed development are supported by the planning application drawings prepared by Malachy Walsh and Partners in compliance with our internal Quality Management System (accredited to ISO: 9001). These drawings accompany the planning application and are referenced as relevant throughout the EIAR. It should be noted that these drawings having been reduced in scale within the EIAR for more convenient examination.