NON-TECHNICAL SUMMARY

Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by MKO on behalf of Clonberne Windfarm Limited, who intend to apply to An Bord Pleánala for planning permission to construct a renewable energy development which will comprise 11 No. wind turbines, and associated infrastructure in the townland of Clonberne, and adjacent townlands, in Co. Galway, and an on-site substation and associated works, including underground cabling to connect to the National Grid. The Proposed Project comprises a single grid connection option due to the site's proximity to the existing Cashla – Flagford 220kV overhead line.

For the purposes of this EIAR:

- Where the 'Proposed Project' is referred to, this relates to all the project components described in detail in Chapter 4 of this EIAR), and it is subject off this planning application under Section 37E of the Planning and Development Act 2000, as amended.
- Where 'the Site' is referred to, this relates to the primary study area for the EIAR, as delineated by the EIAR Site Boundary in green.
- Where the 'Proposed Wind Farm' is referred to, this refers to turbines and associated foundations and hard-standing areas, meteorological mast, borrow pit, access roads, temporary construction compound, turbine delivery accommodation works, peatland enhancement area, underground cabling, peat, spoil and overburden management, site drainage, tree felling and all ancillary works and apparatus. The planning application for the Proposed Wind Farm Site is made to An Bord Pleanála in accordance with the provisions of Section 37E of the Planning and Development Act 2000, as amended.
- Where 'Proposed Grid Connection' is referred to, this refers to the onsite substation, and associated underground 220kV cabling connecting into the existing Cashla – Flagford 220kV overhead line at Laughil, subject to a planning application under Section 182A of the Planning and Development Act, 2000, as amended.

Due to the nature of the proposed renewable energy development, which will have a potential generating capacity of greater than 50 megawatts (MW) and the proposed grid connection to the existing 220kV overhead line requires the provision of 220kV infrastructure which will form part of the national electricity transmission network, two separate planning applications are required.

This planning application is being submitted to An Bord Pleanála (ABP) seeking permission for the Proposed Wind Farm. The application meets the threshold for wind energy set out in the Seventh Schedule of the Planning and Development Act 2000, as amended (being '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 megawatts') and is therefore being submitted directly to An Bord Pleanála as a Strategic Infrastructure Development (SID) in accordance with Section 37E of the Planning and Development Act 2000, as amended. This approach has been confirmed following consultations with the Board under the provisions of Section 37B of the Planning and Development Act 2000 as amended (case reference ABP-307058-20).

A second planning application for the Proposed Grid Connection will be submitted to ABP in accordance with Section 182A of the Planning and Development Act 2000, as amended. This approach has been confirmed following consultations with the Board under the provisions of, Section 182E of the Planning and Development Acts 2000 as amended (case reference ABP- 314729-22).

This EIAR, along with a NIS, will assess the Proposed Project, the Proposed Wind Farm, and the Proposed Grid Connection. This EIAR and NIS will accompany the planning permission applications for the Proposed Wind Farm and Proposed Grid Connection which will be made to An Bord Pleanála

in accordance with the provisions of Section 37A and Section 182A of the Planning and Development Act 2000, as amended. Both the EIAR and NIS contain the information necessary for An Bord Pleanála to complete the Appropriate Assessment and Environmental Impact Assessment as required for these planning permission applications.

This EIAR complies with the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU.

Applicant

The applicant for the Proposed Project is Clonberne Windfarm Limited. Clonberne Windfarm Limited is a subsidiary company of Cregmore Construction Ltd., which is an Irish-owned, Galway-based company with extensive experience in the design, construction, and operation of wind energy developments throughout Ireland, with projects currently operating in Galway. Cregmore Construction Ltd. have wide ranging experience in the area of electricity connections to the national grid and electricity substation development and various other utilities projects.

Brief Description of the Proposed Project

The full description of the Proposed Project is detailed in Chapter 4 of this EIAR. The current planning application, relating to the Proposed Wind Farm, is being made to An Bord Pleanála under Section 37E of the Planning and Development Act, 2000, as amended.

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

The proposed development will consist of the provision of the following:

i. *11 no. wind turbines with a maximum overall ground-to-blade tip height of up to 180 metres; a rotor blade diameter of 162 metres; and hub height of 99 metres, and associated foundations, hard-standing and assembly areas;*
ii. *Underground electrical cabling (33kV) and communications cabling;*
iii. *Provision for the undergrounding of a section of 38kV overhead electrical cabling (as proposed under GCC Ref No. 24/60230), including the provision of 2 no. 38kV Line to Cable Interface End Masts up to a height of 16.2 metres and associated cable ducting to facilitate the undergrounding of the proposed 38kV cabling;*
iv. *Upgrade of existing tracks/ roads and provision of new site access roads, junctions and hardstand areas;*
v. *Construction of 1 no. new gated site entrance off the R328 Regional Road to facilitate the delivery of the construction materials and turbine components to site;*
vi. *Construction of 2 no. temporary construction compounds and associated ancillary infrastructure including temporary site offices, staff facilities and car-parking areas for staff and visitors, all to be removed at end of construction phase;*
vii. *Development of 1 no. borrow pit;*
viii. *Provision of 3 no. passing bays adjacent to the L22321 Local Road and an existing access track to facilitate the transport of stone material to the site;*
ix. *Peat and spoil management including the provision of 4 no. peat repository areas and 1 no. spoil repository area;*
x. *Junction accommodation works including temporary accommodation areas adjacent to the N83 National Secondary Road, R328 Regional Road and L6466 Local Road to facilitate the delivery of turbine components to site;*
xi. *Site Drainage;*
xii. *Peatland Enhancement Area;*
xiii. *Biodiversity Enhancement Measures (including the planting of woodland, linear habitat, grassland management and invasive species removal);*
xiv. *Tree felling and hedgerow removal to facilitate construction and operation of the proposed development;*

xv. *Operational stage site signage; and*
xvi. *All ancillary works and apparatus.*

The application is seeking a ten-year planning permission.

A concurrent planning application in relation to a proposed substation which will comprise of a 220kV Gas Insulated Switchgear (GIS) building, an Independent Power Producer (IPP) compound, a Battery Energy Storage System (BESS) compound, underground grid connection and associated cabling to connect to the existing Flagford to Cashla 220kV overhead line in the townland of Laughil is also being lodged to An Bord Pleanála. Current and future wind turbine generator technology will ensure that the wind turbine model, chosen for the Proposed Project, will have an operational lifespan greater than the 35-year operational life that is being sought as part of the planning application.

Modern wind turbine generators currently have a typical generating capacity in the 4 to 7 MW range, with the generating capacity continuing to evolve upwards as technology improvements are achieved by the turbine manufacturers. For the purposes of this EIAR it is assumed that the wind turbine model installed as part of the Proposed Project will have a generating capacity of 7MW. Therefore, on this basis, the proposed 11 no. wind turbines would have a combined generating capacity of 79.2MW. The actual turbine procured as part of a competitive tender process may have a generating capacity that is marginally lower or greater than the 7MW turbine described in the EIAR. Irrespective of the generating capacity of the actual turbine procured, the conclusions of the EIAR will not be materially affected.

Need for the Proposed Project

Ireland faces significant challenges to its efforts to meet EU targets for renewable energy by 2030 and its commitment to transition to a low carbon economy by 2050. Further detail can be found in Chapter 2 of this EIAR.

The Proposed Project provides the opportunity to capture an additional part of County Galway's valuable renewable energy resource. If the Proposed Project were not to proceed, the existing uses of small-scale agriculture would continue. The opportunity to harness the wind energy resource of County Galway would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions. The opportunity to generate local employment and investment would also be lost.

Economic Benefits

The Proposed Project will have both long-term and short-term benefits for the local economy including income to local landowners, job creation, work opportunities for local businesses and service providers, local authority commercial rate payments and a Community Benefit Scheme.

Commercial rate payments from the Proposed Project will be provided to Galway County Council each year during the construction phase, which will be redirected to the provision of public services within Co. Galway. These services include provisions such as road upkeep, fire services, environmental protection, street lighting, footpath maintenance etc. along with other community and cultural support initiatives.

It is estimated that the Proposed Project has the potential to create up to 100 jobs during the construction phase and 3-4 jobs during operational and maintenance phases of the Proposed Project. During construction, additional indirect employment will be created in the region through the supply of services and materials to the renewable energy development. There will also be income generated by local employment from the purchase of local services i.e., travel, goods and lodgings. Further details on employment associated with the Proposed Project are presented in Section 5.3 of this EIAR.

Should the Proposed Project receive planning permission, there are substantial opportunities available for the local area in the form of Community Benefit Funds. Based on the current proposal, a Community Benefit Fund would attract a community contribution in excess of €400,000/year for the local community over the lifetime of the Proposed Project. The value of this fund will be directly proportional to the installed capacity and/or energy produced at the site and will support and facilitate projects and initiatives including youth, sport and community facilities, schools, educational and training initiatives, and wider amenity, heritage, and environmental projects.

Purpose and Scope of the EIAR

The purpose of this EIAR is to document the current state of the environment in the vicinity of the Site of the Proposed Project and to quantify the likely significant effects of the Proposed Project on the environment in accordance with the requirements of the EIA Directive, as amended. The compilation of this document served to highlight any areas where mitigation measures may be necessary in order to protect the surrounding environment from the possibility of any negative impacts arising from the Proposed Project.

The EIAR project team comprises a multidisciplinary team of experts with extensive experience in the assessment of wind energy developments and in their relevant area of expertise. Each chapter of this EIAR has been prepared by a competent expert in the subject matter. The chapters of this EIAR are as follows:

1. *Introduction*
2. *Background to the Proposed Project*
3. *Site Selection and Reasonable Alternatives*
4. *Description of the Proposed Project*
5. *Population and Human Health*
6. *Biodiversity (excluding Birds)*
7. *Ornithology*
8. *Land, Soils and Geology*
9. *Hydrology and Hydrogeology*
10. *Air Quality*
11. *Climate*
12. *Noise and Vibration*
13. *Cultural Heritage*
14. *Landscape and Visual*
15. *Material Assets (including Traffic and Transport, Telecommunications and Aviation)*
16. *Major Accidents and Natural Disasters*
17. *Interactions of Effects*
18. *Schedule of Mitigation Measures*

A Natura Impact Statement has also been prepared in line with the requirements of the Habitats Directive and this EIAR and the NIS will accompany the planning application to the Board for the Proposed Project under Section 37E of the Planning and Development Act 2000, as amended.

Background to the Proposed Project

This section of the EIAR sets out the energy and climate change related policy and targets along with the strategic, regional, and local planning policies relevant to the Proposed Project. It also summarises EIA scoping undertaken, and the cumulative impact assessment process undertaken.

The policies and targets which have been put in place at the various levels of Government in relation to renewable energy and climate change illustrate the urgent need for renewable energy developments such as the Proposed Project to assist Ireland in meeting its national targets and European commitments in relation to climate change and decarbonisation.

The Proposed Project comprises the provision of 11 no. wind turbines with an installed generating capacity of greater than 50 megawatts (MW) and associated infrastructure. The Proposed Wind Farm will connect to the national grid via a 220kV underground grid connection cable from a proposed 220kV onsite substation to the existing 220kV Flagford to Cashla 220kV overhead line. The provision of 2 no. loop-in towers, 2 no. gantries within 2 no. cable compounds will facilitate the connection of the proposed substation to the existing overhead line.

Local Planning Policy

It is considered that the Proposed Project is consistent with the policies and objectives of the Galway County Development Plan 2022-2028.

Galway County Development Plan 2022-2028

The Galway County Development Plan 2022-2028 (GCDP) was adopted on the 9th of May 2022 and came into effect on the 20th of June 2022. It sets out policies and objectives for the proper planning and sustainable development of the County. The GCDP provides the framework within which the decision on the planning application for the Proposed Wind Farm is made.

The importance of climate action is outlined within the GCDP as it states, *"climate action is integrated into every chapter and strategy of the plan"*. A strategic aim of the GCDP relevant to the Proposed Project is outlined below:

> "To reduce the carbon footprint by integrating climate action into the planning system in support of national targets, support indigenous renewable sources in order to reduce dependence on fossil fuels and improve security of supply and the move to a competitive low carbon economy."

The GCDP recognises that an efficient and secure energy supply is essential to the future growth and sustainable development of County Galway:

> *"Reliable and low-cost energy is essential for a high quality of life for the residents of County Galway and also to ensure that the County is an attractive place in which to do business. However, it is essential to ensure that energy demands are met without compromising environmental quality. Energy efficiency, renewable energy development and progression towards a low carbon economy are therefore central themes of this Plan."*

The GCDP presents an "Energy Expectation" for Galway to 2028. It is considered that the Proposed Project supports and is in compliance with these expectations, namely, the reduction in reliance on non-renewable energy sources and its replacement with renewable energy sources.

Local Authority Renewable Energy Strategy

County Galway's Local Authority Renewable Energy Strategy (LARES) is included as Appendix 1 of the GCDP. The LARES for Galway sets out guidance designed to allow County Galway to both contribute to meeting the national legally binding targets while also capitalising on those opportunities associated with the generation and harnessing of renewable energy in a sustainable manner.

The LARES classification that applies to the Site of the Proposed Project is 'Acceptable in Principle' (AIP) (6 of the 11 turbines) and 'Open To Consideration' (OTC) (5 of 11 turbines). The LARES outlines that applications for wind turbines in the AIP areas are areas where wind energy development will be facilitated as an appropriate land use, subject to conformance with the LARES and the proper planning and sustainable development of the area. Wind turbines located in OTC areas are open to development, also subject to conformance with the LARES and the proper planning and sustainable development of the area.

The Proposed Wind Farm has been designed in accordance with the opportunities and sensitivities set out in the LARES and presents an appropriate and suitable opportunity for wind energy development.

Wind Energy Development Guidelines

The relevant considerations under the 'Wind Energy Development Guidelines for Planning Authorities' (Department of the Environment, Heritage and Local Government (DOEHLG, 2006) hereafter referred to as 'the Guidelines', have been taken into account during the preparation of the EIAR.

The aim of these guidelines was to assist the proper planning of wind power projects in appropriate locations around Ireland. The Guidelines highlight general considerations in the assessment of all planning applications for wind energy. They set out advice to planning authorities on planning for wind energy through the development plan process and in determining applications for planning permission. They contain guidelines to ensure consistency of approach throughout the country in the identification of suitable locations for wind energy development. Each wind project has its own characteristics and defining features, and it is therefore impossible to write specifications for universal use. Guidelines should be applied practically and do not replace existing national energy, environmental and planning policy. While the Guidelines remain the relevant guidelines in place, at the time of lodgement, decision makers (Planning Authorities and An Bord Pleanála) are not bound to their provisions and they can (and do) consider updated standards/requirements/specifications in assessing impacts and the proper planning and sustainable development of the area.

The Department of Housing, Planning and Local Government published the Draft Guidelines in December 2019 and they remain in draft at the time of writing. The Draft Guidelines note that potential impacts of wind energy development proposals on the landscape, including the natural and built environment, must be considered along with the legitimate concerns of local communities.

The design of the Proposed Wind Farm has been designed in accordance with the Guidelines and has also been developed with the provisions of the Draft Guidelines in mind (for example in relation to 4 times turbine tip height set back distance from sensitive properties).

Planning History

A planning search was carried out through the National Planning Application Database and An Bord Pleanála's online planning portal in May 2024 for relevant planning applications lodged since 2014 within the planning application boundaries of the Proposed Wind Farm and the Proposed Grid Connection. The planning applications found during the search comprise of small-scale permissions relating to agriculture, forestry, one off rural dwellings and updates to electrical grid infrastructure. Within Galway County Council's area of jurisdiction 1 no. extant permission was identified within both of the planning application boundaries, relating to the construction of a new forest road along with associated site works for forestry use.

A planning search was also carried out to establish permitted, operational and proposed wind energy developments within 25km of the proposed turbines for the purposes of informing the potential cumulative effects. The search was carried out using the relevant local authority, An Bord Pleanála and EIA planning portals in February 2024 for relevant planning applications. In total, 9 no. applications relating to wind energy were identified within 25km of the proposed turbines, 3 no. of which relate to single turbine developments and a further 5 no. of which relate to larger multiple turbine wind farm developments.

Scoping and Consultation

Chapter 2 Section 2.6 of the EIAR presents detail of the EIA Scoping undertaken with regards to the Proposed Project. A scoping report providing details of the Proposed Project and setting out the scope of work was prepared by MKO, and circulated in September 2020, with follow up scoping taking place

in December 2023. MKO requested the comments of the relevant personnel/bodies in their respective capacities as consultees with regards to the EIAR process. As part of the constraints mapping process, which is detailed in Chapter 3 of the EIAR, telecommunications operators and Aviation bodies were also contacted in December 2023 in order to determine the presence of telecommunications links either traversing or in close proximity to the Site of the Proposed Project. Chapter 2 of the EIAR includes a list of scoping consultees and responses received, with full copies of all scoping responses received set out in Appendix 2-2 of the EIAR.

Chapter 2 Section 2.7 of the EIAR includes details of the pre-planning meetings undertaken prior to the planning application being lodged with the following stakeholders:

- The relevant planning authority Galway County Council under the provisions of Section 247 of the Planning and Development Act 2000, as amended.
- An Bord Pleanála under the provisions of Section 37B and Section 182E of the Planning and Development Act 2000, as amended respectively.

The Proposed Project has the potential to have significant benefits for the local economy, by means of job creation, landowner payments and commercial rate payments, and an important part of any renewable energy development, is its Community Benefit Fund. The report in Appendix 2-1 outlines the consultation and community engagement initiatives undertaken by the Applicant prior to the submission of the planning application. It also outlines the main issues identified during this process, how the final proposal reflects community consultation and the steps taken to ensure that the Proposed Project will be of enduring economic benefit to the communities concerned.

Cumulative Impact Assessment

The EIA Directive and associated guidance documents state that as well as considering any direct, indirect, secondary, transboundary, short-, medium-, and long-term, permanent and temporary, positive and negative effects of the project the description of likely significant effects should include an assessment of cumulative impacts that may arise. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project. The factors to be considered in relation to cumulative effects include population and human health, biodiversity, land, soil, water, air, climate, material assets, landscape, and cultural heritage as well as the interactions between these factors.

To gather a comprehensive view of cumulative impacts on these environmental considerations and to inform the EIAR process being undertaken by the consenting authority, each relevant chapter within this EIAR includes a cumulative impact assessment where appropriate.

The potential for cumulative impacts arising from other projects has therefore been fully considered within the EIAR. The cumulative impact assessment of projects has three principle aims:

1) To establish the range and nature of existing, approved and proposed projects within the cumulative impact study area of the Proposed Project.
2) To summarise the relevant projects which have a potential to create cumulative impacts.
3) To identify the projects that hold the potential for cumulative interaction within the context of the Proposed Project and discard projects that will neither directly or indirectly contribute to cumulative impacts.

Assessment material for the cumulative impact assessment was compiled on the relevant projects within the vicinity of the Proposed Project. The material was gathered through a search of relevant online Planning Registers and EIA portal, reviews of relevant EIAR (or historical EIS) documents, planning application details and planning drawings, and served to identify past and future projects, their activities and their environmental impacts.

The geographical boundaries of the various zones of sensitivity of and to the Proposed Project from which there may be potential for cumulative impacts to arise relative to each individual EIAR topic, i.e. each chapter, is presented in Table 2-13 of the EIAR. To gather a comprehensive view of cumulative impacts within the cumulative study area and to inform the EIA process being undertaken by the consenting authority, each relevant chapter within the EIAR addresses the potential for cumulative effects where appropriate and within the context of their identified cumulative study area. A long list of all applications considered by each of the different disciplines in their cumulative impact assessment is included in Appendix 2-3 of the EIAR.

Site Selection and Reasonable Alternatives

This section of the EIAR contains a description of the reasonable alternatives that were studied by the developer, which are relevant to the Proposed Project and its specific characteristics, in terms of site location and other renewable energy technologies as well as site layout incorporating size and scale of the Proposed Project, connection to the national grid and transport route options to the Site. This section also outlines the design considerations in relation to the renewable energy development, including the construction compounds and Grid Connection. It provides an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects. The consideration of alternatives is an effective means of avoiding environmental impacts.

Alternative Locations

The process of identifying a suitable wind farm site is influenced by a number of factors. Site selection for the development of a wind farm must be suitable for consideration under a number of criteria, such as:

- **Planning Policy:** Site location relative to Galway County Development Plan Wind Energy Capacity's classification of areas considered that have capacity for wind farm development from a planning policy perspective;
- **Environmental Sensitivities**: Located outside areas designated for protection of ecological species and habitats;
- **Grid Connection**: Access to the national electricity grid possible within a viable distance;
- **Sensitive receptors**: Capable of complying with required setbacks from sensitive receptors.
- **Site Scale:** Sufficient area of unconstrained land that could potentially accommodate a wind farm development and turbine spacing requirements;

The Site of the Proposed Project has been identified as having potential for a wind energy development as a result of a nationwide search of suitable lands. The site selection process has been constraints and facilitators led. Facilitators are factors that give an advantage to a proposed project, while constraints are restrictions that inform the location and design of a project by highlighting sensitivities. A nationwide constraints analysis was undertaken and included avoidance of environmental designations (Natura 2000 sites), review of national, regional and local policies and objectives, suitable wind speeds, adequate setbacks from sensitive receptors, proximity to national grid nodes, avoidance of direct impacts on known cultural heritage assets, access and constructability.

Alternative Renewable Energy Technologies

Both onshore and offshore wind energy development will be required to ensure Ireland reaches the target set in the Climate Action Plan to source 80 per cent of our electricity from renewable energy by 2030. It is not a case of 'either' 'or'. When considering other renewable energy technologies in the area, the Applicant considered offshore wind and commercial solar energy production as an alternative on the Proposed Project.

Offshore Wind

Cregmore Construction Ltd, the parent company of Clonberne Windfarm Ltd, has a keen interest in offshore wind farms and has explored potential offshore sites. However, it is considered that due to delays with the regulatory process for offshore development, a combination of both onshore and offshore wind farm development will continue to be required to deliver on the ambitious renewable energy targets set under the Climate Action Plan 2024 (CAP) which include focusing on onshore wind energy developments to reach the 2025/2030 renewable energy targets. As such, Cregmore Construction's primary focus remains to be onshore wind farms and they will continue to explore potential development offshore in tandem with delivering suitable sites onshore such as this Proposed Project.

The Applicant, as mentioned above, is a subsidiary company of Cregmore Construction Ltd, which is an Irish-owned, Galway-based company with extensive experience in the design, construction, and operation of wind energy developments throughout Ireland, with projects currently operating in Galway. The Applicant is committed to playing a key role in helping the State achieve its CAP objectives while building upon its proven record of generating clean renewable energy to the national grid. As such, the option of an offshore project is not considered to be a reasonable alternative at this time.

Solar Energy

To achieve the same electricity output from solar energy as is expected from the Proposed Wind Farm (c.79.2MW), a larger development footprint would be required. The site encompasses an area of approximately 353ha and the permanent footprint of the Proposed Project measures approximately 33.7ha, which represents approximately 9.5% of the site.

Alternative Turbine Numbers and Model

It is proposed to install 11 turbines at the Proposed Project which could achieve approximately 79.2 MW output (mid-range capacity). Such a wind farm could also be achieved on the site of the Proposed Project by using smaller turbines (for example 3 MW or 4MW machines). However, this would necessitate the installation of over 20 to 27 turbines to achieve a similar output. Furthermore, the use of smaller turbines would not make efficient use of the wind resource available having regard to the nature of the Proposed Project. A larger number of smaller turbines would result in the wind farm occupying a greater footprint within the Proposed Project, with a larger amount of supporting infrastructure being required (i.e., roads etc) and increasing the potential for environmental impacts to occur. Alternative Turbine Layout and Development Design

Alternative Turbine Layout and Design

The design of the Proposed Project has been an informed and collaborative process from the outset, involving the designers, developers, engineers, landowners, environmental, hydrological and geotechnical, archaeological specialists and traffic consultants. The aim being to reduce potential for environmental effects while designing a project capable of being constructed and viable.

Following the mapping of all known constraints, detailed site investigations were carried out by the project team. The ecological assessment of the Proposed Project encompassed habitat mapping and extensive surveying of birds and other fauna. This assessment, as described in Chapter 6 of this EIAR on Biodiversity, optimised the decision on the siting of turbines and the carrying out of any development works, such as the construction of roads. The hydrological assessment of the Proposed Project encompassed site specific flood modelling for 100-yr and 1000-yr events. This assessment, as described in Chapter 9 of this EIAR on Water, optimised the decision on the siting of turbines, roads and the onsite substation. Where specific areas were deemed as being unsuitable for the siting of turbines or roads, etc., alternative locations were proposed and assessed, taking into account the areas

that were already ruled out of consideration. The turbine layout for the Proposed Project has also been informed by the results of noise, landscape and visual and shadow flicker assessments as they became available.The final proposed layout takes account of the results of all onsite investigations and baseline assessments that have been carried out during the EIAR process, including noise, landscape and visual. The final chosen layout is considered the optimal layout given it has the least potential for environmental effects.

Alternative Grid Connection Cabling Route Options

The Proposed Grid Connection has been proposed to connect to the national grid via underground electrical cabling, located primarily within the public road corridor via a loop-in to the Cashla – Flagford 220kV line at Laughil. Underground electrical cables will transmit the power from each wind turbine to the proposed onsite substation.

A key consideration in determining the grid connection method for a proposal wind energy development is whether the cabling is underground or run as an overhead line. While overhead lines are less expensive and more accessible for easier repairs when required, underground lines will have no visual impact. For this reason, it was considered that underground lines would be a preferable alternative to overhead lines. The Wind Energy Guidelines (DoHLG, 2006) (the Guidelines) also indicate that underground cables are the preferred option for connection of a wind energy development to the national grid. The underground electrical cabling will follow the route of existing public roads, thereby minimising the amount of ground disturbance required.

The final Proposed Grid Connection design also takes account of the findings from all site constraints (e.g., ecology, archaeology, hydrology, peat depths etc.), site investigations and baseline assessments, and design constraints (e.g., third party lands) that have been carried out during the EIAR process.

Alternative Transport Route and Site Access

Wind turbine components (blades, nacelles, and towers) are not manufactured in Ireland and therefore must be imported from overseas and transported overland to the Proposed Project. With regard to the selection of a transport route to the Proposed Project, alternatives were considered in relation to turbine components, general construction-related traffic, and site access locations.

The alternatives considered for the port of entry of wind turbines into Ireland for the Proposed Project include Port of Galway, Shannon Foynes Port and Dublin Port. Shannon Foynes Port is the principal deepwater facility on the Shannon Estuary and caters for dry bulk, break bulk, liquid, and project cargoes. Port of Galway and Dublin Ports also offers a roll-on roll-off procedure to facilitate import of wind turbines. All three ports and indeed others in the state, offer potential for the importing of turbine components. The primary chosen port of entry is Galway Port due to its proximity from the port to the M17 motorway, in which the exit to the national and regional roads towards the Proposed Project is accessible.

Alternative Mitigation Measures

Mitigation by avoidance has been a key aspect of the Proposed Project's evolution through the selection and design process. Avoidance of the most ecologically sensitive areas of the site limits the potential for environmental effects. As noted above, the site layout aims to avoid any environmentally sensitive areas. Where loss of habitat occurs in the Site, this has been mitigated with the proposal of habitat enhancement and improved habitat connectivity with hedgerow replanting on the Proposed Project. Any forestry felled within the footprint of the Proposed Project will be replaced offsite, with no net loss. The alternative to this approach is to encroach on the environmentally sensitive areas of the Site and accept the potential environmental effects and risk associated with this.

The best practice design and mitigation measures set out in this EIAR will contribute to reducing any risks and have been designed to break the pathway between the site and any identified environmental receptors. The alternative is to either not propose these measures or propose measures which are not best practice and effective and neither of these options is sustainable.

Description of the Proposed Project

This section of the Environmental Impact Assessment Report (EIAR) describes the Proposed Project and all its component parts. This EIAR, along with Natura Impact Statement (NIS), will assess the Proposed Project, i.e. the Proposed Wind Farm, and the Proposed Grid Connection. This EIAR and NIS will accompany the planning permission applications for the Proposed Wind Farm and Proposed Grid Connection which will be made to An Bord Pleanála in accordance with the provisions of Section 37A and Section 182A of the Planning and Development Act 2000, as amended.

The Proposed Wind Farm will consist of the provision of the elements as outlined in Section 1.1 Introduction.

The overall layout of the Proposed Project is shown on Figure 4-1, this includes the Proposed Wind Farm and Proposed Grid Connection. The Core of the Site Layout is shown in Figure 4-2.

The overall layout of the Proposed Project is shown on Figure 4-1 in Chapter 4 of this EIAR, this includes the Proposed Wind Farm site and the Proposed Grid Connection. The Proposed Wind Farm site layout is shown in Figure 4-3. The Proposed Grid Connection layout is shown in Figure 4-4. Detailed planning application drawings of the Proposed Wind Farm are included in Appendix 4-1 of this EIAR, and drawings of the Proposed Grid Connection are included in Appendix 4-2. All elements of the Proposed Project have been assessed as part of this EIAR.

The proposed wind turbine layout has been optimised using industry standard wind farm design software to maximise the energy yield from the Proposed Wind Farm, while maintaining sufficient distances between the proposed turbines to ensure turbulence and wake effects do not compromise turbine performance. The Grid Reference coordinates of the proposed turbine locations are listed in Table 4-1 below.

Table 0-1 Proposed Wind Turbine Locations and proposed top of foundation level

Turbine	ITM Coordinates		Top of Foundation Elevation (mOD)
	Easting	Northing	
T1	534719	743135	25
T2	535362	743777	33
T3	535624	743329	35
T4	536599	744396	54
T5	536497	743788	43
T6	536894	743549	37
T7	537371	743516	39
T8	538278	743808	40

The turbine model to be installed on the Proposed Wind Farm will have an overall turbine tip height of 180 metres; blade rotor diameter of 162 metres and hub height of 99 metres. Modern wind turbines from the main turbine manufacturers have evolved to share a common appearance and other major characteristics, with only minor cosmetic differences differentiating one from another. The wind turbines that will be installed on the Proposed Wind Farm will be conventional three-blade turbines, that will be geared to ensure the rotors of all turbines rotate in the same direction at all times.

The Proposed Project makes use of the existing road network insofar as possible. It is proposed to upgrade approximately 2.2km of existing site roads and tracks, and to construct approximately 10km of new access road on the Site of the Proposed Project.

Two temporary construction compounds are proposed in the north and centre of the site measuring approximately 4,971 and 8,755 square metres respectively (Figure 4-11 and Figure 4-12 respectively). The compound in the northern section of the Proposed Wind Farm will be located adjacent to the proposed new road north of Turbine No. 1. The second temporary construction compound will be located will be located in the centre of the site adjacent to a proposed new road junction, located east of Turbines no. 7 and 8. The location of the proposed construction compounds are shown on the Proposed Project layout drawing in Figure 4-2. Temporary port-a-loo toilets and toilets located within a staff portacabin will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewaters being tankered off site by permitted waste collector to wastewater treatment plants. There will also be a water supply on site for hygiene purposes, by way of a temporary storage tank. Construction materials and turbine components will be brought directly to the proposed turbine locations following their delivery to the Proposed Wind Farm.

As part of the felling in the Proposed Project, the proposed felling of 2.14ha of woodland and scrub felling will be required to accommodate the proposed turbines and the associated bat setback buffers, wind farm roads and other key infrastructure. Section 2.1 in the Biodiversity Management and Enhancement Plan in Appendix 6-6 provides further detail on the felling areas, species and associated infrastructure. This will be offset through the planting of native woodland within the site (2.89ha) to offset that loss as well as achieving biodiversity net gain, as such this habitat would constitute a high local biodiversity value. The planting of 2.89ha of native tree species will result in an increase of approx. 0.75ha of woodland within the Site, accounting for the felling of wet willow-alder-ash woodland, bog woodland, immature woodland and scrub during the construction phase.

As discussed, the Proposed Grid Connection will be subject to a separate planning application under Section 182A of the Planning and Development Act, 2000, as amended. The Proposed Grid Connection is detailed in Appendix 4-8 of this EIAR. The proposed onsite 220kV substation is located within existing agricultural land and will be accessed via the operational access roads.

It is proposed to construct an Independent Power Producer (IPP) Building as part of the Proposed Project and is shown in Figure 4-18 of Chapter 4 of this EIAR. The IPP Building is shown in Site Layout Drawings (Grid Connection) which are also included in Appendix 4-2. The IPP Building will have a footprint of 5,594m^2 and will be constructed with a masonry built structure comprising a concrete foundation, concrete block external walls with a cavity and a timber framed roof with a slate finish. The internals of the building will comprise a control room, switch room, store areas and welfare facilities.

It is estimated that the construction phase of the Proposed Project will take approximately 18-24 months from starting on site to the commissioning of the electrical system. In the interest of breeding birds, construction will not commence during the Breeding Bird season from April to July inclusive. Construction may commence at any stage from August onwards to the end of March, so that construction activities are ongoing by the time the next breeding bird season comes around and can continue throughout the next breeding season.

The Proposed Project is expected to have a lifespan of approximately 35 years. Planning permission is being sought for a 35-year operation period commencing from the date of full operational commissioning of the Proposed Project. During the operational period, on a day-to-day basis the wind

turbines will operate automatically, responding by means of meteorological equipment and control systems to changes in wind speed and direction.

The wind turbines will be connected together, and data relayed from the wind turbines to an off-site control centre. Each turbine will also be monitored off-site by the wind turbine supplier. The monitoring of turbine output, performance, wind speeds, and responses to any key alarms will be monitored at an off-site control centre 24-hours per day.

Population and Human Health

One of the principal concerns in the development process is that human beings, as individuals or communities, should experience no significant diminution in their quality of life from the direct, indirect, or cumulative effects arising from the construction, operation and decommissioning of a development. Ultimately, all the impacts of a development impinge on human beings, directly and indirectly, positively, and negatively. The key issues examined in this chapter of the EIAR include population, human health, employment and economic activity, land-use, residential amenity, community facilities and services, tourism, property values, shadow flicker, noise, and health and safety.

The Proposed Wind Farm site is located c.14km to the north-east of Tuam, and c.6.5km to the south-east of Dunmore in Co. Galway.

Current land-use on the Proposed Project is commercial turf cutting and agriculture. Current land-use along the Proposed Grid Connection cabling route serves as part of the public road network. Land use in the wider landscape of the site comprises a mix of agriculture, low density housing, wind farms and commercial forestry.

The design, construction and operation of the Proposed Project will provide employment for technical consultants, contractors and maintenance staff. The construction, operation and maintenance phases of the Proposed Project is anticipated to generate approximately 80 to 100 jobs. The construction phase of the Proposed Project will last between approximately between 18 – 24 months. Most construction workers and materials will be sourced locally, thereby helping to sustain employment in the construction trade.

There is currently no published credible scientific evidence to positively link wind turbines with adverse health effects. . The main publications supporting the view that there is no evidence of any direct link between wind turbines and health are summarised in Chapter 5 of this EIAR. Although there have been no empirical studies carried out in Ireland on the impacts of wind farms on property prices, the literature described above demonstrates that at an international level, wind farms have potential to impact property values in local areas; however, it is important to note that this impact is proven to reduce throughout the operational phase of a wind farm.

Residential amenity relates to the human experience of one's home, derived from the general environment and atmosphere associated with the residence. The quality of residential amenity is influenced by a combination of factors, including site setting and local character, land-use activities in the area and the relative degree of peace and tranquillity experienced in the residence.

When considering the amenity of residents in the context of a proposed wind farm, there are three main potential effects of relevance: 1) Shadow Flicker, 2) Noise, and 3) Visual Amenity. Shadow flicker and noise are quantifiable aspects of residential amenity while visual amenity is more subjective.

Shadow flicker is an effect that occurs when rotating wind turbine blades cast shadows over a window in a nearby property. Shadow flicker is an indoor phenomenon, which may be experienced by an occupant sitting in an enclosed room when sunlight reaching the window is momentarily interrupted by a shadow of a wind turbine's blade. Outside in the open, light reaches a viewer (person) from a much less focused source than it would through a window of an enclosed room, and therefore shadow flicker

assessments are typically undertaken for the nearby adjacent properties around a proposed wind farm site.

The current, adopted guidance for shadow flicker in Ireland is derived from the '*Wind Energy Development Guidelines for Planning Authorities 2006'* (DoEHLG), and the '*Best Practice Guidelines for the Irish Wind Energy Industry'* (Irish Wind Energy Association, 2012). The 2006 DoEHLG Guidelines state that at distances greater than 10 rotor diameters from a turbine, the potential for shadow flicker is very low.

The DoEHLG 2006 wind energy guidelines recommend that shadow flicker at dwellings within 500 metres of a proposed turbine location should not exceed a total of 30 hours per year or 30 minutes per day. The closest occupied residential property is located approximately 726m from the nearest turbine location (See Figure 5-3) of Chapter 5 of the EIAR.

Impacts on human beings during the construction, operational and decommissioning phases of the Proposed Project are described in Chapter 5 in terms of health and safety, employment and investment, population, land-use, noise, dust, traffic, tourism, residential amenity, renewable energy production and reduction in greenhouse gas emissions, shadow flicker and interference with communication systems. Where a negative impact is identified, appropriate mitigation measures will be put in place to ensure that there will be no significant health effects on sensitive receptors in the surrounding area

The study area for the shadow flicker assessment is 10 times rotor diameter from each turbine as detailed in Section 5.2.3.2 of Chapter 5 of the EIAR. The Guidelines note that, at distances greater than 10 times the rotor diameter of a proposed turbine, the potential for shadow flicker is very low, and therefore the shadow flicker study area is set at 1.62km from the proposed turbines. All inhabitable dwellings within 1.62km of the proposed turbines has been considered as part of the following shadow flicker assessment. A significant minimum separation distance of above 720m from any third-party dwelling has been achieved with the Proposed Project design, thus exceeding the necessary setback distance. There are 169 no. properties located within the shadow flicker study area as detailed above, of which 12 no. properties are in the ownership of landowners who form part of the Proposed Project. The shadow flicker study area and sensitive receptor locations are shown in Figure 5-3 of Chapter 5 of the EIAR.

Impacts on human beings during the construction, operational and decommissioning phases of the Proposed Project are described in Chapter 5 in terms of health and safety, employment and investment, population, land-use, noise, dust, traffic, tourism, residential amenity, renewable energy production and reduction in greenhouse gas emissions, shadow flicker and interference with communication systems. Where a negative impact is identified, appropriate mitigation measures will be put in place to ensure that there will be no significant health effects on sensitive receptors in the surrounding area.

Biodiversity

This chapter assesses the likely significant effects (both alone and cumulatively with other projects) that the Proposed Project may have on Biodiversity and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified.

To inform the assessment, a comprehensive desk study and suite of field surveys have been carried out. Multidisciplinary walkover surveys were undertaken on 28th June 2019, 15th July 2019, 19th August 2019, 5th August 2021, 24th August 2021, 25th August 2021, 24th January 2022, 30th September 2022, 1st October 2022, 26th June 2023, 1st September 2023, 23rd November 2023 and the 18th January 2024. The majority of the habitat surveys of the Site covered the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith *et al.*, 2011). Dedicated species/habitat specific surveys including for, bats, and protected mammals and detailed habitat assessment surveys were carried out, during which any incidental records of other species were also recorded. In addition, baseline aquatic habitat, fisheries and macroinvertebrate surveys have been undertaken as part of the detailed baseline assessment, the detailed results of which are provided in technical appendices to this EIAR

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

The habitats on the Proposed Project site were the subject of a detailed survey and assessment and habitat mapping. This habitat mapping and assessment was undertaken following the '*A Guide to Habitats in Ireland*' (Fossitt, 2000). Grassland habitats have also been categorised to plant communities from the National Survey of Upland Habitats (Perrin *et al.* 2014) and the Irish Vegetation Classification.

Peatlands makes up a significant proportion of the habitats within the EIAR Site Boundary. The EIAR Site Boundary comprises large areas of cutover bog (Fossitt code PB4), conifer plantation (WD4) and improved agricultural grassland (GA1). The cutover bog has been colonised by scrub (WS1) in many areas. Remnant areas of uncut raised bog (PB1) are found in the northwest and southeast of the site. The areas of improved agricultural grassland have primarily been intensively managed for livestock grazing, and transition into mosaics of wet grassland (GS4) in many areas. A network of hedgerows (WL1), treelines (WL2) and drainage ditches (FW4) occur throughout the EIAR Site Boundary and delineate the field boundaries, with drainage ditches also traversing the areas of cutover bog. Other less expansive habitats also within the EIAR Site Boundary include buildings and artificial surfaces (BL3), spoil and bare ground (ED2), recolonising bare ground (ED3), wet willow-alder-ash woodland (WN6), bog woodland (WN7) and immature woodland (WS2). The main watercourse flowing through the Site is the Levally Stream is a Depositing/ Lowland River (FW2) with a predominantly silty substrate and a moderate/fast flow. The location of new watercourse crossings has been specifically chosen to facilitate the use of precast concrete bottomless box culverts, thereby ensuring that no instream works are necessary in these locations and minimising potential for impact on the receiving environment.

The Proposed Grid Connection underground electrical cabling route traverses an area of cutover bog to the east of the proposed substation before running under an existing local road. The majority of the lands on either side of the road along the length of the are made up of improved agricultural grassland, wet grassland and conifer plantation, with associated hedgerow, treelines and scrub. A depositing/ lowland river and drainage ditches also cross the underground electrical cabling route at a number of locations.

The construction of the Proposed Project will result in the loss of areas of habitat that are of Local Importance (lower value) including the loss of coniferous plantation forestry, spoil and bare ground,

recolonising bare ground, stone walls and other stonework, buildings and artificial surfaces, improved agricultural grassland and wet grassland which have been assessed as of low ecological value and no specific mitigation is required for the loss of these habitats.

Approximately 1,155m of hedgerows and treelines will be permanently removed within and around the footprint of the Proposed Project to facilitate some elements of infrastructure and new access roads. Removal of this combined length hedgerow/treeline is also required to achieve the required buffer distance for the protection of bats, from the turbines to the canopy of the nearest habitat feature, as recommended by the Natural England (2014) and NatureScot (2021). It is proposed to plant 1,875m of new hedgerow to offset this potential loss and to provide additional habitat connectivity within the Site. Overall, the proposed replanting will result in a net gain of approximately 720m in the linear landscape features within the Site.

Approximately 2.14ha of broadleaved woodlands in the wet willow-alder-ash woodland (WN6), bog woodland (WN7), immature woodland (WS2) and scrub (WS1) will be removed to facilitate Proposed Project infrastructure and the required bat buffer distance as outlined above. It is proposed to plant 2.89ha of native tree species to offset this potential loss, to provide additional habitat within the Site. Overall, the proposed replanting will result in a net gain of approximately 0.75ha of broadleaved woodland within the Site.

While there will be no loss of any raised bog within the Site it is proposed, as a biodiversity enhancement measure, to rewet a portion of the raised bog within the Site. An area of 11.6ha of uncut raised bog has been identified for habitat enhancement. Although uncut, the habitat has been heavily drained through the insertion of parallel drains. This area is located in the southeast of the Site and adjoins a large area of uncut raised bog which has not been drained in a similar manner. It is proposed to undertake drain blocking within this area of raised bog. he purpose of this measure is to raise the water table in the drains, and in adjacent areas in order to re-establish wetter conditions associated with more intact raised Bog.

Bat species composition and abundance was found during detailed bat surveys undertaken at the Proposed Project site to be typical of the geographic location and nature of the Site, and the Site is utilised by a regularly occurring bat population of Local Importance (higher value). Following the implementation of mitigation no potential for residual significant effects with regard to loss of commuting and foraging habitat, loss or damage to roosts, displacement or other construction phase impacts have been identified; the proposed net gain in linear landscape features within the site will result in a long-term positive impact on bats at the local level. In relation to potential collision risk and injury with operational turbines, an adaptive monitoring and mitigation strategy has been devised for the Proposed Project in line with NatureScot (2021) Guidance, which will ensure that there is no potential for significant residual effects on local bat populations during the operational phase of the Proposed Project.

Whilst no signs of otter activity were recorded within the site of the Proposed Project, evidence of otter was recorded downstream of the site and there is also hydrological connectivity between the proposed development site and Lough Corrib SAC, for which otter is a Qualifying Interest.

Watercourses within the Wind Farm Site and along the Grid Connection underground electrical cabling route provide suitable habitat for otter, and evidence of the species was recorded in the form spraints and prints both within and downstream of the EIAR Site Boundary. No otter holts or other resting places were recorded during any of the ecological surveys. There is no potential for direct loss or fragmentation of significant otter habitat including loss of breeding or resting places. Given that no otter holts or resting places were recorded within the Site, no direct mortality, significant disturbance or any barrier to the movement of otter is anticipated. From a precautionary perspective, a pre-commencement otter survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works. In the unlikely event that an otter holt is identified within or immediately adjacent to the footprint of the Proposed Project, consultation will be undertaken with the

National Parks and Wildlife Service and any additional mitigation required would be implemented, under a derogation licence where required.

One active badger sett was found within the Site. Given the proximity of the identified sett to the Proposed Grid Connection route there is potential for disturbance and direct mortality of badger using the sett as a result of noise/tunnel or sett collapse during works associated with the grid connection route. As such, an exclusion of the existing sett will be carried out in line with TII (2009) guidelines to ensure no badgers are present within the sett during construction works. From a precautionary basis, a pre-commencement badger survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works to ensure that no additional setts in close proximity to proposed infrastructure have been built. In the event that an additional badger sett is identified within or immediately adjacent to the footprint of the Proposed Project, mitigations as per TII (2009) guidance will be implemented for the new sett.

Approximately 0.22ha of *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] will be lost in order to accommodate the construction of new site road located to the east of Turbine 1. The loss will be located at the very edge of this habitat adjacent to an existing field boundary. It will avoid fragmentation of this habitat and will be confined to a degraded section at the edge of the habitat area.

In order to minimise the loss of Molinia Meadow habitat, the area required to facilitate construction of the road will be fenced off prior to construction and no access to the meadow outside the fenced area will be permitted. The remaining 6.17ha of Molinia Meadows habitat that will be retained as part of the Proposed Project, will be subject to low stocking levels, will have no application of fertilizer and no additional drainage of the meadow or surrounding area and if appropriate the meadow will be cut for hay each year.

No significant effects on surface water quality, groundwater quality or the hydrological/ hydrogeological regime were identified during construction, operation, or decommissioning. A full hydrological assessment in relation to the Proposed Project has been carried out in Chapter 9 of the EIAR.

In relation to designated sites, three nationally designated site (Drumbulcaun Bog pNHA, Knockavanny Turlough pNHA and Levally Lough pNHA) have been identified as being within the zone of impact, on a precautionary basis. No potential for residual adverse impacts on this pNHA have been identified following implementation of mitigation measures in relation to potential effects on groundwater quality, therefore no significant effects on these pNHAs are anticipated.

An Appropriate Assessment Screening Report and Natura Impact Statement (NIS) accompanies this EIAR. These reports have been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment screening and an Appropriate Assessment for the Proposed Project in compliance with Article 6(3) of the Habitats Directive. The Appropriate Assessment Screening Report identified the potential for significant effect on three European Sites (Lough Corrib SAC, Levally Lough SAC and Williamstown Turloughs SAC). The NIS concludes that the Proposed Project, individually or in-combination with other plans or projects, will not adversely affect the integrity of any European Site.

It is therefore judged that, provided that the Proposed Project is constructed and operated in accordance with the design, best practice and mitigation that is described within this application, significant residual impacts on biodiversity will not occur. The Biodiversity Enhancement Measures outlined for the Proposed Project will result in a slight long term increase in biodiversity value within the Site.

Ornithology

Chapter 7 of this EIAR assesses the likely significant effects that the Proposed Project may have on bird species. Firstly, a brief description of the Proposed Project is provided. This is followed by a comprehensive description of the methodologies that were followed in order to obtain the information necessary to complete a thorough assessment of the potential effects of the Proposed Project on bird species. The survey data is presented in full in the Environmental Impact Assessment Report (EIAR) appendices with a summary of the information presented within this chapter. An analysis of the results is then provided, which discusses the ecological significance of the birds recorded within the surveyed area. The potential effects of the Proposed Project are then described in terms of the construction, operation and decommissioning phases of the development. An accurate prediction of the effects is derived following a thorough understanding of the nature of the Proposed Project along with a comprehensive knowledge of bird activity within the study area. The identification of key ornithological receptors (KORs) and the assessment of effects follow a precautionary approach.

The potential for effects on designated sites is fully described in the Natura Impact Statement (NIS) that accompanies this application. The NIS concluded that where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction, operation and decommissioning of the Proposed Project will not adversely affect the integrity of any European sites.

Based on the detailed assessment, it is considered that the potential effects of the Proposed Project upon birds will not be significant. Effects associated with habitat loss, disturbance displacement, collision risk and cumulative effects have been assessed to be no greater than long-term slight negative effect (EPA, 2017) and low effect significance (Percival, 2003).

The implementation of the prescribed mitigation measures will render any potential effects on avian receptors to low significance. In conclusion, no significant effects as a result of the Proposed Project are foreseen on key ornithological receptors of the study area.

Lands, Soils and Geology

Chapter 8 of this EIAR provides a baseline assessment of the environmental setting of the Proposed Development by assessing the potential likely significant effects that the construction, operation and decommissioning of the Proposed Project will have on land, soils and geology.

The geology of the Site comprises cutover raised bog (peat) and limestone tills over limestone bedrock. Trial pit and drilling investigations were undertaken to investigate the subsoil and bedrock conditions below the peat. Peat depths were determined by probing.

The peat thickness encountered by probing across the Site varies from 0m to a maximum of 6.65m, with an average of 1.68m recorded. A total of no. 194 peat probes were carried out at the Site.

One of the most notable findings of the intrusive investigations is the large depths of overburden/glacial tills present at the Site. Investigation drilling in the area of the cutover bog encountered between 9.7m and 15.5m of mainly CLAYs and SILTs (glacial deposits) below the peat and shell marl layer. The confirmed depth of glacial tills in grassland areas on the north of the Wind Farm is between 5.7m and 13.8m.

Bedrock was not confirmed in any of the 15 no. trial pits carried out at the Site (termination depths of trial pits were up to 3.5mbgl – metres below ground level).

The drilling shows the limestone bedrock below the glacial tills varies from strong competent limestone to very weathered limestone and with some clay infilled fractures. Bedrock heterogeneity is a typical feature of karstified limestone.

Construction of the Proposed Project infrastructure will require the removal of peat, soil and rock to competent foundation. An on-site borrow pit as well as local quarries will provide material for access road, turbine bases and general hard-standing construction. The turbine base construction will comprise both gravity foundation and piled foundation. Removal of soil, peat and bedrock represents a permanent direct impact on the geology of the Site which is considered to be an acceptable part of economic progression and development.

During the construction phase sources of contaminants (such as oil based substances or other hazardous chemicals) will not be stored at the Site except where this is done within safely bunded areas that safely contain all spillages and prevent the migration of contaminants into soil, peat and bedrock. Refuelling will be done with a double skinned bowser with spill kits on the ready in case of accidental spillages. The risk is considered to be low once mitigation measures are implemented.

The Peat Stability Risk Assessment undertaken, which involved analysis of 194 no. locations, showed that all Proposed Project infrastructure elements are located in areas of negligible to low risk. Notwithstanding the above, the management of peat stability and appropriate construction practices will be inherent in the construction phase of the Proposed Project to ensure peat failures do not occur on site.

A Peat Management Plan has been prepared for the Proposed Project which details management of peat and spoil during construction works and long term storage thereafter. The majority of peat and spoil removed during the excavation works will be deposited in proposed on-site spoil and peat repositories. A smaller quantity will be taken off-site to a licenced waste facility.

The potential residual impacts associated with soil or ground contamination and subsequent health effects are imperceptible.

No significant impacts on land, soil and geological environmental are anticipated during the construction, operation or decommissioning phases of the Proposed Project.

The land, soils and geology impact assessment undertaken in this chapter outlines that significant effects will not occur due to the localised nature of the construction works and therefore there is no potential for cumulative effects.

Hydrology and Hydrogeology

This chapter assesses the likely significant effects that the Proposed Project may have on hydrology and hydrogeology and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified.

Regionally, the Site is located in the Lough Corrib surface water catchment and within the River Clare sub-catchment. On a more local scale the Site drains directly to the Levally Stream and Sinking River.

Due to the nature of Wind Farm and Grid Connection developments, being near surface construction activities, effects on groundwater are generally negligible and surface water is generally the main sensitive receptor assessed during impact assessments. The primary risk to groundwater would be from oil spillage and leakages at turbine foundations or during construction plant refuelling. These are common potential impacts to all construction sites (such as road works and industrial sites). These potential contamination sources are to be carefully managed at the proposed site during the construction and operational phases of the development and measures are proposed within the EIAR to deal with these potential minor local impacts.

The Site is underlain by a Regionally Important Aquifer, however due to the basin peat geological setting, the groundwater vulnerability rating of the Site is mainly Low. This is because the majority of the Site is covered by low permeability peat as well as deep glacial deposits, which acts as a protective cover to the underlying limestone aquifer. The low vulnerability rating means groundwater is much less sensitive to effects.

Any contaminants which may be accidentally released on-site are more likely to travel to nearby streams within surface runoff. The deep and relatively low permeability of the glacial deposits means contaminants are unlikely to reach the bedrock and will instead disperse with the glacial deposits and would remain localised to the source or would be removed as runoff during wet periods.

During each phase of the Proposed Development (construction, operation, and decommissioning) a number of activities will take place at the proposed Site, some of which will have the potential to significantly affect the hydrological regime or water quality at the proposed Site or downstream of the proposed Site. These significant potential effects generally arise from sediment input from runoff and other pollutants such as hydrocarbons and cement-based compounds.

Surface water drainage measures, pollution control and other preventative measures have been incorporated into the project design to minimise significant impacts on water quality and downstream designated sites. A self-imposed 50m stream buffer was used during the design of the Proposed Project, thereby avoiding sensitive hydrological features. The surface water drainage plan will be the principal means of significantly reducing sediment runoff arising from construction activities and to control runoff rates. The key surface water control measure is that there will be no direct discharge of Site runoff into local watercourses or into the existing bog drainage network. This will be achieved by avoidance methods (i.e. stream buffers) and design methods (i.e. surface water drainage plan). Preventative measures also include fuel and concrete management and a waste management plan which will be incorporated into the Construction and Environmental Management Plan.

No significant impacts to surface water (quality and flows) and groundwater (quality and quantity, and any local groundwater wells) will occur as a result of the Proposed Project provided the proposed mitigation measures are implemented. This EIAR presents proven and effective mitigation measures to mitigate the release of sediment which will reduce the concentration of suspended solids to acceptable levels. The storage and handling of hydrocarbons/chemicals will be carried out using best practice methods which will ensure the protection of surface and groundwater quality. The Proposed Project drainage system will be designed to slow surface water runoff from the proposed site by providing greater attenuation. This will ensure that the Proposed Project does not alter downstream surface water flows and will not contribute to downstream flooding.

A Flood Risk Assessment was carried out at the early design stage of the Proposed Project in order to keep as much of the proposed infrastructure outside of mapped flood zones as possible. The Proposed Project will not increase flood risk in the area of the Site.

The EIAR acknowledges that the Gurteen/Cloonmore GWS spring is a very important local water supply that serves a wide population in the area, and that it is classified as an extremely sensitive water supply source. Considering the springs importance and potential sensitivity to impacts from the Proposed Project detailed hydrogeological investigations/monitoring was undertaken that further advances the knowledge of the ZoC/SPA to the Gurteen/Cloonmore GWS spring. This new knowledge with regard the ZoC/SPA along with our understanding of the geological/hydrogeological setting of the Site means this important local water supply can be managed and protected during all phases of the Proposed Project. Potential effects on other nearby sources (i.e. Dunmore/Glenamaddy PWS and Gallagh GWS) were screened out for further assessment due to lack connectivity with the Site.

A hydrological assessment of potential impacts on local designated sites was undertaken. Lough Corrib SAC is located downstream of the Site and is considered very sensitive to affect. Following implementation of the appropriate mitigation measures as outlined in the EIAR no significant impacts on this designated site will occur as a result of the Proposed Project.

A Water Framework Directive (WFD) Compliance Assessment has been completed for all waterbodies (surface water and groundwater bodies) with the potential to be impacted by the Proposed Project. With the implementation of the mitigation measures detailed in this EIAR there will be no change in the WFD status of the underlying groundwater body or downstream surface waterbodies as a result of the Proposed Project. The Proposed Project has been found to be fully compliant with the WFD and will not prevent any waterbody from achieving its WFD objectives.

An assessment of potential cumulative effects associated with the Proposed Project and other developments on the hydrological and hydrogeological environment has been completed. With the implementation of the mitigation measures detailed in this EIAR, the cumulative assessment found that there will be no significant effects on the hydrological and hydrogeological environments.

Air Quality

Chapter 10 of the EIAR identifies, describes and assesses the potential significant direct and indirect effects on air-quality arising from the construction, operation and decommissioning of the Proposed Project.

The Environmental Protection Agency (EPA) has designated four Air Quality Zones for Ireland:

- Zone A: Dublin
- Zone B: Cork
- Zone C: Other cities and large towns comprising Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise
- Zone D: Rural Ireland, i.e., the remainder of the State excluding Zones A, B and C

These zones were defined to meet the criteria for air quality monitoring, assessment and management described in the CAFE Directive, Framework Directive and Daughter Directives. The Proposed Project lies within Zone D, which represents rural areas located away from large population centres.

Due to the non-industrial nature of the Proposed Project and the general character of the surrounding environment, air quality sampling was deemed to be unnecessary for this EIAR.

The production of energy from wind turbines has no direct emissions as is expected from fossil fuel-based power stations. Harnessing more energy by means of wind farms will reduce dependency on fossil fuels, thereby resulting in a reduction in harmful emissions that can be damaging to human health and the environment. Some minor short term or temporary indirect emissions associated with the construction of the wind farm include exhaust and dust emissions.

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2024) was considered in the dust impact assessment. The use of UK guidance is considered best practice in the absence of applicable Irish guidance, and was used to predict the likely risk of dust impacts as a result of the construction works.

A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-4 of the EIAR) and includes dust suppression measures. Following implementation of the mitigation measures detailed in Chapter 10, there will be no significant direct or indirect effects on air quality due to the construction of the Proposed Project. The overall residual effect on air quality will be a long-term moderate positive effect on air quality due to the offsetting of approximately 72,217 of CO_2 per annum (see Chapter 11 for details).

No significant effects on air quality will occur during the construction, operation or decommissioning of the Proposed Project.

Climate

Chapter 11 of this EIAR identifies, describes and assesses the potential significant direct and indirect effects on climate arising from the construction, operation and decommissioning of the Proposed Project.

The production of energy from wind turbines has no direct emissions as is expected from fossil fuel-based power stations. Harnessing more energy by means of wind farms will reduce dependency on fossil fuels, thereby resulting in a reduction in harmful emissions that can be damaging to human health and the environment.

Climate change is one of the most challenging global issues facing us today and is primarily the result of increased levels of greenhouse gases in the atmosphere. These greenhouse gases come primarily from the combustion of fossil fuels in energy use. Changing climate patterns are linked to increased frequency of extreme weather conditions such as storms, floods and droughts. In addition, warmer weather trends can place pressure on animals and plants that cannot adapt to a rapidly changing environment. Moving away from our reliance on coal, oil and other fossil fuel-driven power plants is essential to reduce emissions of greenhouse gases and combat climate change.

In June 2023, the Environment Protection Agency (EPA) released 'Ireland's Greenhouse Gas Emissions Projections 2022-2040'. The EPA has produced two scenarios in preparing these greenhouse gas emissions projections: a "With Existing Measures" (WEM) scenario and a "With Additional Measures" (WAM) scenario. These scenarios forecast Irelands greenhouse gas emissions in different ways. The WEM scenario forecasts Ireland emissions including all national policies and measures implemented by the end of 2021, the latest inventory year. The WAM scenario has a higher level of ambition and includes government policies and measures to reduce emissions, such as those in Ireland's Climate Action Plan 2024 (CAP 2024), that are not yet implemented. As implementation of policies and measures occurs, they will be migrated into the WEM Scenario.

The projections show that implemented policies and measures in the WEM scenario can deliver an 11% reduction in greenhouse gas emissions by 2030 compared to the 2018 level. The WAM scenario, including policies and measures from CAP 2024, is projected to deliver a 29% emissions reduction over the same period. This is well short of the legally binding commitment to achieving a 51% reduction in GHG emissions from 2021 to 2030, and to achieving net-zero emissions no later than 2050. Ireland's new 2030 target under the EU's Effort Sharing Regulation (ESR) is to limit its greenhouse gas emissions by at least 42% by 2030. This target was set in April 2023 upon amendment of the Emissions Sharing Regulation. For Ireland to achieve its national and international climate targets, it will require a full and rapid implementation of CAP 2024 measures and further measures to be implemented.

A methodology was published in June 2008 by scientists at the University of Aberdeen and the Macauley Institute with support from the Rural and Environment Research and Analysis Directorate of the Scottish Government, Science Policy and Co-ordination Division. The document, '*Calculating Carbon Savings from Wind Farms on Scottish Peat Lands'*, was developed to calculate the impact of wind farm developments on the soil carbon stocks held in peat. This methodology was refined and updated in 2011 based on feedback from users of the initial methodology and further research in the area. The web-based version of the carbon calculator, which supersedes the excel based versions of the tool, was released in 2016 and is currently available as Version 1.8.1 which was last updated in 2023. The tool provides a transparent and easy to follow method for estimating the impacts of wind farms on the carbon dynamics of peatlands and was used to assess the effects of the Proposed Project in terms of potential carbon losses and savings, taking into account removal of carbon sequestering vegetation, and operation of the Proposed Project. The model calculates the total carbon emissions associated with the Proposed Project including manufacturing of the turbine technology, transport, and construction of the development.

The full life cycle and embodied carbon of the 11-no. new proposed turbines have been taken account of in the Macauley Institute model. The emissions associated with the embodied carbon, along with the construction phase transport movements of the remaining site infrastructure associated with the Proposed Project are considered using the Transport Infrastructure Ireland (TII) Carbon Tool (TII 2022)[1]. The TII Carbon Tool is customised for road and light rail projects in Ireland, using emission factors from recognised sources during the construction, maintenance, and operation of TII projects in Ireland.

The carbon balance of proposed wind farm developments in peatland habitats has attracted significant attention in recent years. When developments such as wind farms are proposed for peatland areas, there will be direct impacts and loss of peat in the area of the development footprint. There may also be indirect impacts where it is necessary to install drainage in certain areas to facilitate construction. The works can either directly or indirectly allow the peat to dry out, locally, which permits the full decomposition of the stored organic material with the associated release of the stored carbon as CO_2. It is essential therefore that any wind farm development in a peatland area saves more CO_2 than is released. The Proposed Project is situated in predominantly cutover bog, coniferous forestry and agricultural land. For this reason, the carbon balance between the use of renewable energy and the loss of carbon stored in the peat are assessed in Section 11.5.3.1 of the EIAR.

The Proposed Project will result in the loss of 134,051tCO_2e during the construction phase, the details of these carbon losses are provided in Table 11-6 of Chapter 11 of the EIAR. Please note, that in completion of these calculations a number of assumptions have been made under theoretical precautionary conditions; all assumptions are detailed in Appendix 11-1 Carbon Calculations. Therefore, it can be determined that the actual carbon losses associated with the Proposed Project will likely be less than the values provided in Table 11-6 of Chapter 11.

The Proposed Project will have an export capacity of approximately 79.2MW and therefore will help contribute towards the achievement of national and international emission reduction targets, provide much needed grid infrastructure, and the capacity to offset 72,217tCO2e per annum, or 2,527,595tCO2e over its operational lifetime, thereby reducing the greenhouse gas effect. Carbon losses to the atmosphere due to changes in soil and ground conditions and due to the construction and operation of the Proposed Project will be offset by the Proposed Project in approximately 22 months of operation. Please see Section 11.5.3.2 for details on carbon savings/offset calculations.

Following construction of the Proposed Project, there will be a Permanent Imperceptible Negative Effect on Climate as a result of greenhouse gas emissions from construction plant and vehicles, embodied carbon associated with the turbines and construction materials. Operation of the Proposed Project will have a Direct Long-Term Moderate Positive Effect on climate as a result of reduced greenhouse gas emissions.

Noise and Vibration

A noise assessment was undertaken to determine the likely significant noise effects from the construction and operational phases of the Proposed Project.

Predicted construction noise levels at the nearest noise sensitive receptors during all phases of construction are below the threshold values within BS 5228 and are therefore deemed to be not significant.

A background noise survey was undertaken at five noise monitoring locations. The data was analysed in conjunction with on-site measured wind speed data and operational noise limits have been derived in accordance with the WEDG 2006.

[1] *Transport Infrastructure Ireland Carbon Tool for Road and Light Rail Projects: User Guidance Document* https://www.tiipublications.ie/library/GE-ENV-01106-01.pdf

The operational noise assessment was undertaken in two stages, which involved setting the Total WEDG Noise Limits (which are limits for noise from all wind farms in the area) at the nearest noise sensitive receptors, predicting the likely effects and comparing these predictions against the Total WEDG Noise Limits.

Predicted operational noise levels indicate that cumulative noise levels will be negligible at all noise sensitive receptors in proximity to the Proposed Project, and that a cumulative assessment is therefore not required.

Predicted operational noise levels from the Proposed Project indicate that for noise sensitive receptors neighbouring the Proposed Project, operational wind turbine noise meets the Total WEDG Noise Limits at all NALs. In order to meet the noise limits at one Noise Sensitive Receptor, mode management or an alternative candidate wind turbine would be required for one wind speeds and a limited range of wind directions based on the candidate turbine considered in this assessment.

Should the Proposed Project receive consent, the final choice of wind turbine will be subject to a competitive tendering process. The final choice of wind turbine will, however, have to meet the Total WEDG Noise Limits presented in the noise assessment.

Archaeology and Cultural Heritage

Chapter 13 of this EIAR provides an assessment of the potential effects of the Proposed Project on the Cultural Heritage resource was carried out. Cultural heritage includes archaeology, architectural heritage and any other tangible assets. The assessment was based on desktop research, field survey, GIS based mapping, ZTV, and was also assisted by representative photomontages and photowire images.

Where potential effects have been identified appropriate mitigation measures have been proposed in order to minimise any such effects. Proposed mitigation includes a 20m buffer zone around enclosure GA030-073—, pre-development archaeological testing of the Proposed Project infrastructure (turbine bases, hardstands, compounds, new roads, grid connection in greenfield and peatland areas, etc) and archaeological monitoring during the construction stage of the Proposed Project.

Potential indirect effects on the setting of any UNESCO World Heritage Sites and those on a Tentative List within 20km, National Monuments within 10km, recorded monuments within 5km and RPS/NIAH structures within 5km were included in order to assess potential effects on setting in the wider landscape. The ZTV was utilised to assess the level of theoretical visibility of the proposed turbines from cultural heritage assets within the 5km and 10km study areas.

All cultural heritage assets within 100m of either side of the proposed Grid Connection route were assessed for potential effects to same. No direct effects to the recorded archaeological, architectural or cultural heritage resource as a result of the proposed Grid Connection have been identified. Mitigation measures are recommended where deemed appropriate and include archaeological testing of greenfield and peatland areas along the Proposed Grid Connection underground cabling route and associated infrastructure.

An assessment of potential cumulative effects was also undertaken taking into consideration other extant planning applications and existing and proposed wind farms within 25km. While some potential cumulative visual effects to the wider setting of cultural heritage assets is possible when considered with the existing, permitted and proposed wind farms, no significant cumulative impacts have been identified and no cumulative effects to the immediate setting of cultural heritage assets will occur.

An assessment of potential cumulative effects was also undertaken taking into consideration other extant planning applications and proposed wind farms within 20km. While some potential cumulative visual effects to the wider setting of cultural heritage assets is possible when considered with the

proposed wind farms, no significant cumulative impacts have been identified and no cumulative effects to the immediate setting of cultural heritage assets will occur.

Landscape and Visual

Chapter 14 of this EIAR assesses the potential impacts on sensitive landscape and visual receptors which had potential to experience effects as a result of the Proposed Project were assessed through site visits and various tools, such as the production of verified photomontages, ZTV mapping and Route Screening Analysis (see Appendix 14-1 for methodology) to determine and assess the anticipated visibility of the Proposed Project.

The landscape area where the Proposed Project is located in an extensively flat, agricultural landscape. ZTV mapping (Figure 14-1) indicates full theoretical visibility within 5km of the proposed turbines, with occasional patches of limited visibility due to slight elevations. The flat nature of the landscape in the LVIA Study Area results in widespread theoretical visibility throughout, although it is noted that the landcover typical within the LVIA Study Area will substantially inhibit actual visibility on the ground. On-site surveys found that most actual visibility occurs within 5km of the Site, with intermittent views beyond this distance where the turbines appear as background elements, often screened by intervening vegetation.

The landcover of the Site mainly consists of agricultural pastureland fields, cutover peatland and commercial coniferous forestry, with widespread young to mature forestry coverage. Vegetated field boundaries offer natural screening, limiting views within the Site due to its flat terrain and the presence of treelines and hedgerows.

During the construction and operational phases, no Significant landscape effects are identified for designated landscape receptors (see Section 14.7.2.1 and Section 14.7.3.1) and it is determined that the addition of the Proposed Project is consistent with the landscape policies set out in the GCDP.

In terms of effects on landscape character, the proposed turbines are located within LCUs with a sensitivity rating of “Low”, the lowest in the GCDP. The Proposed Project is primarily located on agricultural land and cutover bog. The largest magnitude of change will occur within LCU 5e North River Clare Basin Unit as the proposed turbines will materially change the landscape of this LCA. The proposed turbines are likely to be most visible from areas within 5km of the Site and elevated areas within this LCA. However, in general, there will be no or very limited views of the Proposed Project from parts of LCU 5e beyond 5km of the proposed turbines. Overall, as set out in Appendix 14-2, a ‘Moderate’ effect on the landscape character of this LCU is likely to occur as a result of the Proposed Project, with effects on landscape character primarily limited to areas within 5km of the proposed turbines.

Part of the EIAR Site Boundary also falls within LCU 5c Springfield Basin Unit, where a Slight residual landscape character effect was deemed to arise. The remainder of the LCAs screened in for full assessment were deemed to have residual landscape effects of Slight or Not Significant. These effects are fully assessed and detailed in Appendix 14-2.

The landscape of the Site, with its current land use has a Low sensitivity to wind energy developments (see Section 14.4.2 above). The combination of Low sensitivity and a Substantial magnitude of change results in Slight residual significance for Long-Term landscape effects (See LVIA Methodology, Appendix 14-1), localised to the Proposed Project’s footprint. Effects on the perceptual and aesthetic character of the Site are also deemed to be of Slight significance.

Cumulative effects on landscape character are included in the impact assessment outlined in Appendix 14-2. Cumulative visual effects are also discussed and summarised above in Chapter 14. the Proposed Project is located within a relatively flat agricultural plain extending as far as Lough Corrib to the west, and to the River Shannon to the east. There is limited wind energy development existing at present

within this landscape and within the LVIA Study Area. Wind energy developments do not dominate this landscape type and the addition of the Proposed Project will not substantially alter the baseline status of the landscape in this regard. The landscape has the capacity to absorb another wind energy development without Significant cumulative landscape effects. The flat terrain and high screening levels prevent wind energy developments from dominating the landscape. In general, views of both the proposed turbines and cumulative turbines in combination will be intermittent as a result of the flat terrain and vegetated landscape. There are some additional cumulative effects due to increased views of turbines within this landscape as a result of the addition of the Proposed Project. However, as outlined above, the low level of visibility of both the proposed turbines and other cumulative turbines within the LVIA Study Area means that no Significant cumulative landscape effects will arise.

The significance of the residual visual effect was not considered to be "Very Significant", or "Profound" at any of the 18 no. viewpoint locations. A residual effect of "Significant" was deemed to arise at two locations, with a residual effect of 'Moderate' deemed to arise at seven other locations, whilst all other viewpoints were assessed as resulting in Slight (2), Not Significant (4) and Imperceptible (3) residual visual effects.

The visual assessment of 1 no. protected view screened in for full assessment found no Significant visual effects within the LVIA Study Area. In terms of other sensitive visual receptors, such as recreational, cultural heritage and tourist destinations, settlements and transport routes, visual effects were predominantly deemed either Moderate, Slight, Not Significant, or Imperceptible.

Significant visual effects are deemed to arise at two viewpoint locations nearby to residential receptors located within 1km of the proposed turbines. residential receptors near the proposed turbines benefit from a physical landscape buffer created by field structures and vegetation, mitigating visual impacts and providing a sense of scale in relation to setback distance from the turbines. The highest effects on residential visual amenity are confined to within 1km of the proposed turbines, with scale of turbines in view decreasing rapidly beyond 1km and substantially beyond 1.5km. It is noteworthy that the Proposed Project aligns with the recommended 500m and 4 times tip height set-back distances in the 2006 WEDGs and 2019 draft WEDGs for non-involved residential receptors, ensuring adherence to guidelines. In addition, the viewpoints located between 3-5km from the nearest proposed turbine show that effects on residential receptors will be dramatically reduced in comparison to the closer receptors identified on Figure 14-22. It is relevant then, that the population density, recorded during the 2022 Census as 24.14 persons per km^2, is lower than the national population density and the Galway County population density. As the area surrounding the Site has a low population density, site selection for the proposed turbines has resulted in reduced effects on residential visual amenity than might otherwise be the case.

Cumulative visual effects are included in the impact assessment outlined in Appendix 14-3. The only existing turbines are the two Clonlusk turbines located 11.6km southwest of the nearest turbine of the Proposed Project and there will be limited locations where the proposed turbines will be seen in combination with these. Cumulative visual effects will be minor with no cumulative visual effects on sensitive receptors identified within the LVIA Study Area.

There are two permitted individual wind turbines located within the LVIA Study Area. The permitted Cloonascragh Wind Turbine is located to the south of Tuam, 12.3km southwest of the nearest turbine of the Proposed Project. The permitted Clooncon East Wind Turbine is located 11.3km east of the nearest turbine of the Proposed Project. Both of these turbines are located a large distance from the Site, and in-combination views of the turbines of the Proposed Project and these turbines will be unlikely, considering the flat, vegetated nature of the landscape. It is evident that there will be no substantial combined or in succession views of both the Proposed Project and these permitted turbines. Any views, even where they do occur, will be intermittent, and again as a result of the distance between the Site and the permitted turbines cumulative visual effects will be minor.

There are two proposed wind farms located at the western edge of the LVIA Study Area. The proposed Laurclavagh wind farm (planning application submitted) and the proposed Shancloon wind

farm (planning application not yet submitted). In general, as discussed extensively elsewhere in this chapter, the landscape of the LVIA Study Area is flat, and highly vegetated. Given the flat, and highly vegetated nature of the LVIA Study Area, as well as the large separation distance between these proposed wind farms and the Proposed Project, there will be extremely limited occasions where there is combined visibility of these cumulative developments. There will therefore be no significant cumulative visual effects that occur as a result of the Proposed Project, in relation to these two proposed wind farms.

The proposed (planning application not yet submitted) Cooloo Wind Farm is located within the LVIA Study Area. In general, it is evident that the level of screening present in the landscape substantially reduces the level of actual visibility of both the Proposed Project and the proposed Cooloo turbines. While there is limited combined visibility of both the turbines of the Proposed Project and the proposed Cooloo turbines from the majority of the LVIA Study Area, as screening levels change as a receptor travels through the area, there will be intermittent views of the both the Proposed Project and the proposed Cooloo turbines, resulting in sequential views (where the observer moves to a different point along the route to see the different wind farms) of the proposed turbines and the Cooloo turbines. However, these views will be intermittent, and as a result of the distance between the proposed turbines and the Cooloo turbines cumulative visual effects will be minor with no Significant cumulative visual effects on sensitive receptors identified within the LVIA Study Area. The addition of the Proposed Project will not give rise to Significant cumulative visual effects.

In conclusion, no Significant landscape effects have been identified and Significant visual effects only have potential to occur at a low number of residential properties located within certain areas identified within 1km of the proposed turbines. Overall, visibility of the Proposed Project throughout the LVIA Study Area is deemed to have no Significant effects.

Material Assets

This chapter of the EIAR addresses the likely significant effects of the Proposed Project on transportation infrastructure (Section 15.1 Traffic and Transport), on Telecommunications and Aviation (Section 15.2) and Other Material Assets (Section 15.3), which are economic assets of human origin.

Roads, Traffic, Transport & Access

Introduction

An assessment of the traffic effects was undertaken for the Proposed Project. The assessment considers the likely impacts resulting from the additional traffic movements that will be generated by the Proposed Project during the construction, operational and decommissioning phases on the transport delivery route to the site.

An assessment of the geometry of the delivery route was also undertaken in order to ensure that the abnormally sized vehicles required to deliver the turbine plant to the Site are accommodated.

Traffic Route & Study Area

The delivery route to the Site for the abnormally sized loads transporting the large turbine components commences at Galway Harbour. From Galway Harbour the route travels northeast through Galway City on the R339 and the R336 to the N83 at the junction with the N6 Bothar na dTreabh. From this point the route travels north on the N83 for approximately 19.4 kms through the village of Claregalway to the existing junction with the L-61461. Approximately 80m south of the L-61461 it is proposed to provide a new short, temporary access road which links back into the L-61461 at a point approximately 70m to the west of the existing N83 / L-61461 junction. The temporary access road will provide access for all construction related deliveries that will approach the site on the N83 from the south. From this

point the route travels west on the L-61461 for approximately 300m to the location of a new junction on the north side of the L-61461 that will provide access to the Proposed Wind Farm site.

Vehicle types and network geometry

The types of vehicles that will be required to negotiate the local network will be up to 86.9 metres long and will carry a blade 81.5 metres in length.

An assessment of the geometric requirements of the delivery vehicles was undertaken on the delivery route. Locations where it was established that the existing road geometry will not accommodate all of the vehicles associated with the Proposed Project are highlighted, with the extent of remedial works identified. In addition to the assessment presented, it is recommended that a dry run is undertaken by the transport company to check vertical and horizontal clearance on the transport route prior to construction.

Traffic impact on local network

The estimated impact of the development traffic on the turbine delivery route is laid out in Section 15.1 of the EIAR.

In terms of daily traffic flows it is estimated that the impact of the development traffic on the delivery route will be as follows:

- During the 8 days when the concrete foundations are poured, the effect on the surrounding road network will be negative. It is forecast that the increase in traffic volumes will range from +2.1% on the N83 between Claregalway and Loughgeorge (Link 1), to +3.7% on the N83 just to the south of the L-61461 (Link 2) to a 5-fold increase in traffic flows (+399.8%) on the L-61461 leading to the Proposed Wind Farm site (Link 3), which is currently lightly trafficked. This will have a temporary slight negative effect on the delivery route with the impact forecast to be moderate on the short section of the L-61461.
- For 227 days when the general construction and groundworks are undertaken it is forecast that the increase in traffic volumes will range from +1.0% on the N83 between Claregalway and Loughgeorge (Link 1), to +1.7% on the N83 just to the south of the L-61461 (Link 2) to a 184.9% increase on the L-61461 leading to the site (Link 3). This will have a temporary negative effect on the study network ranging from slight on the majority of the delivery route, to moderate on the short section of the L-61461 leading to the main access junction (Location 5, as discussed in Section 15.1.9.
- For 118 days when the Proposed Grid Connection Underground Cable is being constructed it is forecast that the increase in traffic volumes will range from +0.7% on the N83 between Claregalway and Loughgeorge (Link 1), to +1.2% on the N83 just to the south of the L-61461 (Link 2) to a 126.8% increase on the L-61461 leading to the site (Link 3). This will have a temporary negative effect on the study network ranging from slight on the majority of the delivery route, to moderate on the short section of the L-61461 leading to the main access junction.
- During the 22 days when the various component parts of the wind turbine plant are delivered to the Proposed Wind Farm site using extended articulated HGVs, the effect of the additional traffic on these days will be slight to moderate along the turbine delivery route due to the size of vehicles involved, resulting in increased traffic volumes ranging from+0.5% on the N83 between Claregalway and Loughgeorge (Link 1), to +0.8% on the N83 just to the south of the L-61461 (Link 2) to an 92.5% increase on the L-61461 leading to the Proposed Wind Farm site (Link 3). It is forecast that there will be a negative temporary, slight effect on traffic flows as the delivery of the abnormally sized loads is undertaken at night.
- During the 8 days of the turbine construction stage when general materials are delivered to the Proposed Wind Farm site, it is forecast that the increase in traffic

volumes on these days will range from +0.3% on the N83 between Claregalway and Loughgeorge (Link 1), to +0.5% on the N83 just to the south of the L-61461 (Link 2), to a 56.4% increase on the L-61461 leading to the Proposed Wind Farm site (Link 3).

- This will have a temporary imperceptible negative effect on the N83, and temporary slight negative effect on the L61461 leading to the Proposed Wind Farm site.
- With respect to the traffic volumes that will be generated during the construction of the Proposed Grid Connection underground cable route, all traffic for this and the substation will be delivered via the proposed new temporary link road. It is estimated that there will be approximately 14 daily return trips made by a truck transporting materials, and 7 return trips made by a car to transport construction staff, to and from the site. Short term diversions are forecast for local traffic although the traffic volumes that will be impacted on the local road network are low. By its nature the effects of these additional trips and diversions on the network will be transient, will be temporary and will be slight.

Once the Proposed Project is operational the traffic impact created by maintenance staff will be imperceptible. The residual effect for the decommissioning phase will be less than for the construction stage as set out above and will be slight to imperceptible. There will be no significant effects on Traffic and Transport due to the Proposed Project.

Telecommunications and Aviation

Wind turbines, like all large structures, have the potential to interfere with broadcast signals, by acting as a physical barrier or causing a degree of scattering to microwave links. The most significant effect at a domestic level relates to a possible flicker effect caused by the moving rotor, effecting, for example radio signals. The most significant potential effect occurs where the renewable energy development is directly in line with the transmitter radio path.

During the development of any large project that may affect telecoms or aviation, the Developer is responsible for engaging with all relevant Telecoms Operators and Aviation Authorities to ensure that the proposals will not interfere with television or radio signals by acting as a physical barrier. In the event of any potential impact, the Developer for each individual project is responsible for ensuring that the necessary mitigation measures are in place. All modern wind farms have lighting requirements agreed with IAA and the turbine locations entered into aircraft navigation databases and therefore can be avoided during flight. It is on this basis that it can be concluded that there would be no cumulative effects relating to the Proposed Project and surrounding projects in relation to Telecommunications or Aviation.

The final proposed turbine layout does not overlap with any of the telecommunication links or clearance zones requested by these operators. The remaining consultees who responded to scoping, operate links either outside the Proposed Project, and therefore are not subject to any interference risk, or do not operate any links in the area.

The closest airport to the Proposed Project is the Galway Airport, located at Carnmore, Co. Galway. This airport is located approximately 32km southwest of the Proposed Wind Farm Site. The closest large international airport to the Proposed Project is Ireland West Airport Knock, which is located approximately 38km north of the Proposed Project.

Existing Built Services and Utilities

There are overhead and underground electricity transmission and supply cables within the vicinity of the EIAR Site Boundary. An existing 220kV overhead line traverses a portion of the Site. There is also an existing 110kV overhead line located approximately 2.1km south of the Site. Additionally, there are two existing 38kV lines approximately 10km to the west and 7km to the east of the Site at its closest points.

There is a proposed 38kV Overhead Line (PL Ref: 24/60230) currently proposed by ESB Networks to traverse the Site in a north-south direction. As part of the Proposed Project, it is proposed to construct 2 no. 38kV Line to Cable Interface End Masts to facilitate the undergrounding of the proposed 38kV cabling within the proposed internal access roads for approximately 5.5km. The End Masts will be located adjacent to where Pole no. 101 and Pole no. 118 are currently being proposed in the ESB Networks planning application.

There are no known existing underground electricity cables present on the Site of the Proposed Project.

There are no gas mains located within the EIAR Site Boundary. There are no known existing water services within the site boundary, however it has been assumed that there is the potential to encounter local water services within the subject site. Damage of underground services during construction operations could potentially result in disruption to those local services, and a risk to health and safety of site staff.

Prior to the commencement of construction, a survey of the Site will be undertaken to identify and ensure any services and utilities will not be impacted by the Proposed Project

Major Accidents and Natural Disasters

Chapter 16 of the EIAR describes the likely significant adverse effects on the environment arising from the vulnerability of the Proposed Project as detailed in Chapter 4 to risks of major accidents and/or natural disasters, as well as the potential of the Proposed Project itself to cause potential major accidents and/or natural disasters.

Major accidents or natural disasters are hazards which have the potential to affect the Proposed Project and lead to environmental effects directly or indirectly. These include accidents during construction, operation and decommissioning of the Proposed Project caused by operational failure and/or natural hazards. The assessment of the risk of major accidents and/or disaster is considered in relation to the information required to be provided in the EIAR, i.e. population and human health, biodiversity, land, soil, water, air, climate and material assets, cultural heritage and the landscape.

A desk-study has been completed to establish the baseline environment for which the proposed risk assessment is being carried out. This will influence both the likelihood and the impact of a major accident or natural disaster. Local and regional context has been established prior to undertaking the risk assessment to develop an understanding of the vulnerability and resilience of the area to emergency situations.

Further detail on the baseline environment is provided in Section 16.3 of Chapter 16 of this EIAR.

A wind farm is not a recognised source of pollution. It is not subject to Industrial Emissions Directive regulation or any other Environmental Protection Agency environmental regulatory consent. Should a major accident or natural disaster occur the potential sources of pollution onsite during the construction, operational and decommissioning phases are limited and of low environmental risk. Sources of pollution with the potential to cause significant environmental pollution and associated negative effects such as bulk storage of hydrocarbons or chemicals, storage of wastes, management of flammable materials etc. are limited and so there is an inherent low level of environmental risk associated with major accident or natural disaster impacting the Proposed Project and causing environmental damage.

As outlined in Section 16.4.1 of Chapter 16, the scenarios with the highest risk score in terms of the occurrence of major accident and/or disaster during construction were identified as ‘Contamination’ of the Site and risk of ‘Fire / Gas Explosion’. During operation the scenario with the highest risk score was ‘Fire / Gas Explosion, and during the decommissioning phase the scenario with the highest risk score was identified as ‘Contamination’.

The Proposed Project will be designed and built in line with current best practice and, as such, mitigation against the risk of major accidents and/or disasters will be embedded through the design. In accordance with the provision of the European Commission '*Guidance on the preparation of Environmental Impact Assessment Reports'*, a Risk Management Plan will be prepared and implemented on site to ensure an effective response to disasters or the risk of accidents. The plan will include sufficient preparedness and emergency planning measures.

The risk of a major accident and/or disaster during the construction of the Proposed Project is considered 'low' in accordance with the '*Guide to Risk Assessment in Major Emergency Management'* (DoEHLG, 2010).

It is considered that when the above mitigation is implemented, and all mitigation detailed in the EIAR is implemented, there will not be significant residual effect(s) associated with the construction, operation and decommissioning of the Proposed Project.

Interactions of Effects

The preceding Chapters 5 to 16 of this EIAR identify the potential significant environmental effects that may occur in terms of Population and Human Health, Biodiversity (Flora and Fauna) Ornithology (Birds), Land, Soils and Geology, Water (Hydrology and Hydrogeology), Air Quality, Climate, Noise and Vibration, Landscape and Visual, Cultural Heritage (Archaeological, Architectural and Cultural Heritage), Material Assets (Roads and Traffic, Telecommunications and Aviation), and Major Accidents and Natural Disasters as a result of the Proposed Project as described in Chapter 4 of this EIAR. All of the potential significant effects of the Proposed Project and the measures proposed to mitigate them have been outlined in the preceding chapters of this EIAR. Mitigation measures and best practice measures for the construction, operation and decommissioning of the Proposed Project are detailed in the accompanying Construction and Environmental Management Plan (CEMP) (Appendix 4-4 of this EIAR). However, for any development with the potential for significant environmental effects there is also the potential for interaction between these potential significant effects. The result of interactive effects may exacerbate the magnitude of the effects or ameliorate them or have a neutral effect.

The potential for interaction of impacts has been assessed, throughout this EIAR, as part of the Impact Assessment process. While the work on all parts of the Environmental Impact Assessment Report (EIAR) was not carried out by MKO, the entire project and all the work of all sub-consultants was managed and coordinated by the company. This EIAR was edited and collated by MKO as an integrated report of findings from the impact assessment process, by all relevant experts, and impacts that potentially interact have been assessed in detail in the individual chapters of the EIAR above and summarised in Section 17.2 Of Chapter 17 of this EIAR. .

Where any potential negative effects have been identified during the assessment process, these impacts have been avoided or reduced by design and the proposed mitigations measures, as presented throughout the EIAR.