Environmental Impact Assessment Report – Non-Technical Summary

Proposed Glenora Wind Farm Development, Co. Mayo.

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NON-TECHNICAL SUMMARY

Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by McCarthy Keville O'Sullivan Ltd. (MKO) on behalf of Glenora Wind Farm Designated Activity Company (DAC), who intend to apply to An Bord Pleanála for planning permission for the construction of a wind energy development in Glenora and adjacent townlands, near the village of Ballycastle, Co. Mayo. The proposed development is being brought forward in response to local, national, regional and European policy regarding Ireland's transition to a low carbon economy, associated climate change policy objectives and to reduce Ireland's dependence on imported fossil fuels for the production of electricity.

The proposed wind energy development will encompass 22 No. wind turbines with blade tip height of 180 metres (m) above the top of the foundation The application meets the threshold for wind energy set out in the Seventh Schedule of the Planning and Development Acts 2000 to 2023, on foot of a notice issued by An Bord Pleanála (the Board) on 9th May 2023 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 Acts 2000 to 2023, as amended.

This EIAR accompanies the planning application for the proposed development submitted to the Board. The planning application is also accompanied by a Natura Impact Statement ('NIS').

The proposed development is located within existing commercial forestry properties in the townlands of Glenora, approximately 6 kilometres (km) southwest of the village of Ballycastle, Co. Mayo. The site location context is shown in Figure 1-1a and Figure 1-1b.

The townlands within which the project (i.e. the main proposed wind farm site, the on-site substation the grid connection cabling route and turbine delivery route accommodation works) is located are listed in Table 1-1. All townlands are located in Co. Mayo.

Table 1-1 Townlands within which the project is located.

Townlands within which the project is located:	
Proposed Wind Farm Development (infrastructure subject of this planning application)	
Glenora	Lugnalettin
Altderg	Ballykinletter
Keerglen	Ballyglass
Glencullin	Aghoo
Killeena	Ballycastle
Intended Wind Farm Substation Location and Grid Connection Cabling Route	
Glenora	Glencullin
Aghoo	Sralagagh East
Ballyglass	Killeena

Ballinglen	Ballycastle
Anna Beg	Annagh More
Creevagh More	Creevagh Beg
Kincon	Farmhill
Kinnavally	Ardnagor
Ballinagavna	Rathnadoffy
Ballygowan	Lecarrowanteean
Knockaunderry	Killogunra
Coolcran	Cloonalough
Farragh	Cloonmaan
Cloonawillin	Cloonfadda
Mullafarry	Magherabrack
Tawnaghmore Upper	Lisglennon
Other Intended Turbine Delivery Route Accommodation Works	
Ballyglass East	

Applicant

The applicant, Glenora Wind Farm DAC, is a joint venture between SSE Renewables and FuturEnergy Ireland.

Need for the Proposed Development

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 Development provides the opportunity to capture an additional part of County Mayo's valuable renewable energy resource. If the Proposed Development were not to proceed the opportunity to capture this additional part of Mayo's valuable renewable energy resource 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.

Economic Benefits

The Proposed Development will have several significant long-term and short-term benefits for the local economy including job creation, local authority commercial rate payments and a Community Benefit Scheme.

The annual commercial rate payments from the proposed development to Mayo County Council, will be redirected to the provision of public services within this county. These services include items 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 Development will create approximately 100-120 jobs during the construction phase and 2-3 jobs during the operational and maintenance phases of the proposed development. During construction, additional employment will be created in the region through the supply of services and materials to the development. In addition to this, there will also be income generated by local employment from the purchase of local services i.e., travel and lodgings.

Should the proposed development 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 in the region of €10.5 million will be made available over the lifetime of the 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.

Further details on the proposed Community Gain proposals are presented in Section 4.5 of this EIAR.

Purpose and Structure of this EIAR

The purpose of this EIAR is to document the current state of the environment in the vicinity of the proposed development site and to quantify the likely significant effects of the proposed development on the environment. The EIAR submitted by the applicant provides the relevant environmental information to enable the Environmental Impact Assessment (EIA) to be carried out by the competent authority, in this case An Bord Pleanála.

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

A Natura Impact Statement has also been prepared in line with the requirements of the Habitats Directive and will be submitted to the Planning Authority as part of the planning application documentation.

Background to the Proposed Development

This section of the EIAR presents the policies and targets which have been put in place both nationally and internationally in relation to renewable energy and climate change. The details below set out the need for the Proposed Development to aid Ireland in meeting its national targets and European commitments in relation to climate change and decarbonisation.

The Proposed Development comprises the provision of a wind farm of 22 no. wind turbines, which is capable of generating approximately 158.4 MW of renewable energy and provide it for use onto the national grid. The need to decarbonise the economy and reduce emissions has always been imperative, however in recent years the urgency involved has become clearer to all stakeholders. The Climate Action Plan (CAP) published by the Government in 2023 sets out the detail for taking action to achieve a 51% reduction in overall greenhouse gas emissions by 2030, and to reach net-zero emissions by no later than 2050. The 2023 Plan builds on the measures and technologies set out in the 2021 Climate Action Plan to deliver greater ambition. The greater ambition requires a greater range of measures under the 2021 Plan, reflected in two categories of 'core measures' and 'further measures'. 'Core measures', set out to meet the 2030 targets, cover the fundamentals of decarbonisation and include the development of a renewable energy electricity supply. These 'core measures' are not, by themselves, sufficient to deliver the ambitions set out in the CAP and so a series of 'further measures' will also be necessary which are more technically challenging or not yet available in Ireland at the scale required, e.g. Biogas/biomethane, green hydrogen, carbon capture and storage. While deploying all the core measures would reduce emissions by 10-11 MtCO2eq. by 2030, undertaking further measures could close the gap. All sectors will have to further their efforts from those outlined in the CAP if the core and further measures are to be achieved.

The primary driver behind the Proposed Development is the need to provide additional renewable energy to offset the use of fossil fuels within the electricity generating sector. Increasing electricity generation from wind power represents the most economical renewable option to reduce emissions within the power generation sector and is the most mature technology available to achieve national targets that have been established for decarbonisation.

This review of relevant local, national and international policy contained in this chapter of the EIAR concludes that the proposed Glenora Wind Farm is consistent with the overarching planning framework with regard to facilitating the move away from dependency on fossil fuels and the promotion of proper planning and sustainable 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) have been taken into account during the preparation of this EIAR.

The aim of these guidelines is 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 2006 Guidelines remain the relevant guidelines in place at the time of lodgement, and decision makers (Planning Authorities and ABP) are required to have regard to them, they are not bound to apply their provisions and they can (and do), where there is sufficient justification, consider updated standards/requirements/specifications in assessing impacts and the proper planning and sustainable development of the area.

Planning History

The relevant planning history of the Proposed Development site, the planning applications in the vicinity of the site along with other wind energy applications within the wider area are set out in Chapter 2 of the EIAR.

Scoping and Consultation

Scoping is the process of determining the content, depth and extent of topics to be covered in the environmental information to be submitted to a competent authority for projects that are subject to an Environmental Impact Assessment. This process is conducted by contacting the relevant authorities and Non-Governmental Organisations (NGOs) with interest in the specific aspects of the environment with the potential to be affected by the proposal. These organisations are invited to submit comments on the scope of the EIAR and the specific standards of information they require. Comprehensive and timely scoping helps ensure that the EIAR refers to all relevant aspects of the subject development and its potential effects on the environment and provides initial feedback in the early stages of the project, when alterations are still easily incorporated into the design. In this way scoping not only informs the content and scope of the EIAR, it also provides a feedback mechanism for the proposal design itself.

A scoping report, providing details of the application site and the subject grid connection, was prepared by MKO and circulated in March 2021 to relevant parties. The scoping report issued provided information on the topics below and is included in this EIAR.

- Description of the Proposed Development Site, including Site Location and Access, Land-Use, Designated Areas and Landscape Policy;
- Planning Context;
- Site Selection;
- Description of the Proposed Development; and
- Scope of the EIAR and Natura Impact Assessment

MKO requested the comments of the relevant personnel/bodies in their respective capacities as consultees with regards to the EIA process. Details of that scoping progress can be found at Section 2.6 of this EIAR.

Scoping responses received are set out in Appendix 2-1 of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and contents of same.

Cumulative Impact Assessment

To gather a comprehensive view of cumulative impacts on these above environmental considerations 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. Chapter 2 sets out the approach taken in relation to the methodology for the cumulative impact assessment of the Proposed Development and other relevant developments other projects.

The cumulative impact assessment of projects has three principle aims:

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

Assessment material for the cumulative impact assessments carried out within this EIAR was compiled in relation to the relevant developments within the various zones of sensitivity of, and to, the Proposed Development from which there may be potential for cumulative impacts to arise. The material was gathered through a search of relevant online planning registers, reviews of relevant EIS/EIAR documents, planning application details and planning drawings, and served to identify past and future projects, their activities and their environmental impacts.

Consideration of Reasonable Alternatives

This chapter of the EIAR includes a description of the reasonable alternatives studied by the developer which are relevant to the project and its specific characteristics and an indication of the main reasons for the option chosen, taking into account the environmental effects. The consideration of alternatives typically refers to alternative design, technology, location, size and scale. A 'Do Nothing Scenario' i.e. an outline of what is likely to happen to the environment should the Project not be implemented, should also be included.

The applicant undertook a detailed screening process, through Geographical Information Spatial software (GIS), using a number of criteria and stages to assess the potential of a large number of possible sites, on lands within its stewardship (c. 441,000 hectares), suitable to accommodate a wind energy development. The GIS database drew upon a wide array of key spatial datasets such as forestry data, ordnance survey land data, house location data, transport, existing wind energy and grid infrastructure data and environmental data such as ecological designations, landscape designations and wind energy strategy designations available at the time. The application of the above criteria to identify a site relevant to the project and its specific characteristics, resulted in the selection of a site known as Glenora, located near Ballycastle in Co. Mayo as a candidate site to be brought forward for more detailed analysis.

Although the screening exercise was based on identifying lands for wind development; a reasonable alternative source of renewable electricity generation, namely solar, was considered based on the scale and current land-use of the Glenora site that emerged. A wind energy development was considered to be the most efficient method of electricity production at this site. A solar array development would have a higher potential environmental effect on Hydrology and Hydrogeology, Traffic and Transport (construction phase) and Biodiversity and Birds (habitat loss, glint and glare) at the site.

The design of the proposed development has been an informed and collaborative process from the outset, involving the designers, developers, engineers, environmental, hydrological and geotechnical, archaeological specialists and traffic consultants. The design process has also taken account of the recommendations and comments of the relevant statutory and non-statutory organisations, near neighbours / the local community and local authorities as detailed in Sections 2.6 and 2.7 of this EIAR. The aim of the process being to reduce the potential for environmental effects while designing a project capable of being constructed and viable.

The final proposed turbine layout takes account of all site constraints and the distances to be maintained between turbines and from houses, roads, etc. The layout is based on a combination of the results of all site investigations and surveys that have been carried out during the EIAR process, the community engagement process that began in September 2020 (e.g., landscape and visual sensitivities of nearby residents was taken into consideration) and the scoping with statutory and non-statutory consultees. As information regarding the site of the proposed development was compiled and assessed, the proposed layout has been revised and amended to take account of the physical constraints of the site and the requirement for buffer zones and availability of land as well as cumulative impacts.

It was decided at an early stage during the design of the proposed development that maximum possible use would be made of existing roadways and tracks, where available and where possible, to minimise the potential for impacts by using new roads as an alternative. An alternative option of constructing an entirely new road network, having no regard to existing roads or tracks was not favourable, as it would

create the potential for additional significant environmental effects to occur in relation to land, soils and geology (increased excavation and aggregate requirements), hydrology (increased number of new watercourse crossings) and biodiversity (increased habitat loss).

The use of multiple temporary construction compounds was deemed preferable to the alternative of a single large compound at the site for a number of reasons. Principally, it will facilitate more efficient construction practices and will result in shorter distances for traffic movements within the site during construction. As a result, vehicle emissions and the potential for dust arising will be reduced.

One alternative substation location was considered at a very early stage of the design of the proposed development, as shown in Figure 3-5 of the EIAR. This alternative location was more located in the northern part of the site and it would have led to an increase in the length of grid connection cabling to the nearest existing substations.

While overhead lines are less expensive and allow 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 proposed underground grid connection route was one of two grid connection routes considered at the outset of the design process of the proposed development. The chosen underground grid connection route to the existing Tawnaghmore substation was chosen due to the significantly shorter distance compared to the alternative route to Bellacorick substation.

The proposed borrow pit locations were selected due to the presence of competent or usable rock at an acceptable level below existing surface level. Developing borrow pits at the alternative locations that were subject to site investigations, would result in a significant increase in the volumes of peat and spoil to be excavated in order to access the usable rock underneath and therefore much higher volumes of excavated material that would need to be managed onsite. The excavation of such increased volumes of peat and spoil has the potential to lead to adverse environmental effects in relation to peat instability and dust emissions.

The chosen Port of Entry considered for the Proposed Development is Galway Port. The alternative considered for the port of entry of wind turbines for the Proposed Development was Killybegs Harbour in Donegal due to its similar proximity to the site. Both ports have been considered for this project given that they are the closest commercial ports to the site of the Proposed Development, however, others in the State (including Dublin, Cork and Shannon-Foynes), offer potential for the importing of turbine components and therefore are also viable alternatives.

An assessment of two site access route options was carried out, taking account of criteria such as third-party land requirements, existing road upgrade and new road construction requirements and associated environmental effects. The proposed site access route between Galway Port and the site was the chosen option as it required less accommodation /widening works than the alternative route from Killybegs Harbour. Therefore, there is reduced potential effects in relation to impacts for other road users.

Description of the Proposed Development

The overall layout of the proposed development is shown on Figure 4-1a and Figure 4-1b in Chapter 4 of the EIAR. This drawing shows the proposed locations of the wind turbines, electricity substation, construction compounds, internal roads layout and the site entrances. Detailed site layout drawings of the proposed development are included in Appendix 4-1 to this EIAR.

The proposed wind turbine layout has been optimised using industry standard wind farm design software to maximise the energy yield from the site, while maintaining sufficient distances between the proposed turbines to ensure turbulence and wake effects do not compromise turbine performance.

The proposed wind farm development comprises the construction of 22 No. wind turbines and all associated works. The proposed turbines will have a blade tip height of 180 metres above the top of the foundation. The applicant is seeking a ten-year planning permission. The full description of the proposed wind farm development, as per the public planning notices, is as follows:

1. *The construction of 22 no. wind turbines and all associated hard-standing areas with the following parameters:*
    a. *A total blade tip height of 180m,*
    b. *Hub height of 99m, and*
    c. *Rotor diameter of 162m.*
2. *1 no. permanent Meteorological Anemometry Masts with a height of 99 m and associated hardstanding area;*
3. *Upgrade of existing tracks and roads, provision of new permanent site access roads and upgrade of 1 no. existing site entrance including the provision of 1 no. security cabin with automatic traffic barriers;*
4. *Temporary widening of sections of public road in the townland of Ballyglass;*
5. *The provision of a new temporary roadway in the townland of Ballyglass to facilitate the delivery of turbine components and other abnormal loads;*
6. *1 no. wind farm operation and maintenance control building in the townland of Glenora;*
7. *3 no. borrow pits.*
8. *13 no. permanent peat placement areas.*
9. *5 no. temporary construction compounds with temporary site offices and staff facilities;*
10. *Permanent recreation and amenity works, including marked trails, seating areas, amenity car park, and associated amenity signage;*
11. *Site drainage;*
12. *Site Signage;*
13. *Ancillary forestry felling to facilitate construction and operation of the proposed development;*
14. *All works associated with the habitat enhancement and biodiversity management within the proposed wind farm site;*
15. *All associated site development works and ancillary infrastructure.*

This application is seeking a ten-year permission and 35 year operational life from the date of commissioning of the renewable energy development.

Current and future wind turbine generator technology will ensure that the wind turbine model, chosen for the proposed development, will have an operational lifespan greater than the 35 year operational life that is being sought as part of this application.

For assessment purposes, it has been assumed that each of the proposed turbines will have a minimum output of 6MW and a maximum output of 9MW. It is likely that future wind turbine generator technology will facilitate greater outputs from turbines of the dimensions proposed as part of this application.

The layout of the proposed development has been led by consideration of constraints and facilitators, thereby avoiding the environmentally sensitive parts of the site. The roads layout for the proposed development maximises the use of the existing onsite access roads and tracks where possible, with approximately 15.4 kilometres of existing roadway/ tracks requiring upgrading and approximately 10.5 kilometres of new access road to be constructed.

The EIAR Site Boundary for the proposed development encompasses an area of approximately 1,810 hectares, the majority of which comprises commercial forestry plantation. The permanent footprint of the proposed development measures approximately 67 hectares, which represents approximately 3.9% of the primary study area.

It is intended to construct a 110 kV substation within the site and to connect this to the existing Tawnaghmore 110kV substation, located 14km southeast of the intended on-site substation location, in the townland of Tawghnamore Upper. The intended grid connection route will be via underground cabling located within existing forestry tracks, local county roads and national secondary roads. The cabling route measures approximately 28km in total. The construction of the grid connection cabling route will, in the event that planning consent is granted, be undertaken by a statutory undertaker having a right or interest to provide services in connection with the proposed wind farm development.

The majority of the area encompassed by the EIAR Site Boundary is currently used for commercial forestry, a small proportion of which will be felled to accommodate the wind farm development. A total area of approximately 116 hectares of commercial forestry will require replacement elsewhere in the State, subject to licence. Details regarding the area to be felled are outlined in Chapter 4 of this EIAR.

The overall project, including wind farm, grid connection, abnormal load delivery route works and forestry felling have been assessed as part of this EIAR and is collectively referred to as the "Proposed Development" throughout.

In addition to the economic benefits of the proposed development, there will be potential social and recreational benefits associated with the recreational and amenity proposals that will form part of the project. The proposed development and all its associated infrastructure creates a unique opportunity to develop an amenity area for use by members of the local and wider community alike. The upland nature of the site is attractive to both locals and visitors to the area. It is proposed to develop some recreational walks as part of the Glenora Wind Farm project. These proposed walks will utilise existing forest tracks and new wind farm roads. The proposed amenity facilities will allow for a safer and improved visitor experience and allow the site to be more openly available to walkers, trail runners, cyclists and other recreational users, as outlined in Section 4.6 of Chapter 4 of this EIAR.

The protection of the watercourses within and surrounding the site, and downstream catchments that they feed is of utmost importance in considering the most appropriate drainage proposals for the site of the proposed development. The proposed development drainage design has therefore been proposed specifically with the intention of having no negative impact on the water quality of the site and its associated rivers and lakes, and consequently no impact on downstream catchments and ecological ecosystems. No routes of any natural drainage features will be altered as part of the proposed development and turbine locations and associated new roadways have been selected to avoid natural watercourses, and existing roads are to be used wherever possible. There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses. Buffer zones around the existing natural drainage features have been used to inform the layout of the proposed development.

It is estimated that the construction phase will take approximately 18 to 24 months from starting onsite to the full commissioning of the wind farm. The construction phase can be broken down into three main phases, 1) civil engineering works: 9 months, 2) electrical works: 6 months, and 3) turbine erection and commissioning: 3 months.

During the operational phase, each turbine will be subject to a routine maintenance programme involving a number of checks and changing of consumables, including oil changes. In addition, there will be a requirement for unscheduled maintenance, which could vary between resetting alarms to major component changes requiring a crane. Typically, maintenance traffic will consist of four-wheel drive vehicles or vans. The electricity substation and site tracks will also require periodic maintenance.

The wind turbines proposed as part of the proposed development are expected to have a lifespan of approximately 35 years. Following the end of their useful life, the wind turbines may be replaced with a new set of turbines, subject to planning permission being obtained, or the proposed development may be decommissioned. The onsite substation will remain in place as it will be under the ownership of the ESB/Eirgrid.

Population and Human Health

One of the principal concerns in the development process is that 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, the impacts of a development have the potential to impinge on human health, directly and indirectly, positively and negatively. The key issues examined in this chapter of the EIAR include population, human health, encompassing employment and economic activity, land-use, residential amenity (noise, visuals, setbacks), community facilities and services, tourism, property values, shadow flicker and health and safety.

A minimum separation distance of approximately 1,170m between occupied, residential dwellings and the proposed wind turbines has been achieved with the project design. This exceeds the requirements for setback distances from residential dwellings as set out in the Draft Wind Energy Development Guidelines (December 2019).

As stated above, approximately 80 – 100 jobs could be created during the construction, operation and maintenance phases of the proposed development with most construction workers and materials sourced locally, thereby helping to sustain employment in the construction trade. This will have a Short-Term Significant Positive Impact.

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 effects of wind farms on property prices, it is a reasonable assumption based on the available international literature that the provision of a wind farm at the proposed location would not impact on the property values in the area.

Shadow flicker is an effect that occurs when rotating wind turbine blades cast shadows over a window in a nearby property. Shadow flicker 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. Shadow flicker effect lasts only for a short period of time and happens only in certain specific combined circumstances. Current guidelines recommend that shadow flicker at neighbouring 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 potential flicker that will occur at houses located within the area surrounding the proposed development was calculated using the WindFarm software package and a regional sun factor was applied. The shadow flicker prediction model indicates that no existing residential property will experience shadow flicker due to the operation of the Proposed Development. Therefore, there will be no effects in relation to shadow flicker. However, this prediction does not consider wind direction or screening provided by intervening vegetation and topography.

Where shadow flicker exceedances are experienced, suitable mitigation measures as outlined in Chapter 5 will be employed at the potentially affected properties to ensure that the current adopted 2006 DoEHLG guidelines are complied with at any dwelling within the 1.62km study area. The same mitigation strategies also demonstrate that the Proposed Development can be brought in line with the shadow flicker requirements of the Draft Revised Wind Energy Development Guidelines (2019) should they be adopted while this application is in the planning system.

Impacts on human beings during the construction and operational phases of the proposed development 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 was identified, the appropriate mitigation measures will be put in place to ensure that there will be No Adverse Impacts on human health in the surrounding area.

Following consideration of the residual effects (post-mitigation), the proposed development will not result in any significant effects on population and human health. Provided that the proposed wind farm development is constructed and operated in accordance with the design, best practice and mitigation that is described within this application, significant effects on population and human health are not anticipated at international, national or county or local scale.

Biodiversity

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

Multidisciplinary walkover surveys and detailed botanical surveys were undertaken on the 2nd July 2021, 9th July 2021, 18th August 2021, 2nd September 2021, 24th September 2021, 18th January 2022, 25th January 2022, 20th April 2023 and the 3rd May 2023. The survey timings were targeted to generally fall within the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith et al., 2011), as well as to carry out targeted protected species surveys. A comprehensive walkover of the entire site was completed.

The habitats on the site of the Proposed Development 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). Peatland habitats have also been categorised to plant communities from the National Survey of Upland Habitats (Perrin et al. 2014) and the Irish Vegetation Classification.

The majority (1,157ha) of the EIAR Site Boundary is dominated by commercial coniferous forestry (WD4) (including clear fells), comprising mainly of Lodgepole pine (*Pinus contorta*) with some Sitka spruce (*Picea sitchenis*) planted on Lowland Blanket Bog (PB3). Remnants of Blanket Bog are still found in degraded form on sloping ground along watercourses and road margins. The site is accessible via the Ballyglass local road and a network of existing forestry access tracks and forestry roads. The Proposed Development site is surrounded by Lowland Blanket Bog (PB3) to the north, west. south and southeast Within the site this habitat is confined to the northern section of the site. A small area (1.3ha) of degraded bog habitat will be lost to the footprint of the Proposed Development. However, it is proposed to enhance the existing peatland habitat in the northwest of the site (approximately 40ha) through drain blocking and the removal of encroaching conifers (establishing as a result of natural seed dispersal). This is fully described in the site-specific Biodiversity Management Plan (BMP) accompanying this application. The BMP also includes for the removal of Rhododendron from a number of areas within in the site boundary.

In general, given the highly modified nature of the site, dominated by commercial coniferous forestry (WD4), limited suitable habitat occurs on site for protected faunal species. One badger sett was recorded within the EIAR study area boundary, however detailed camera trap surveys concluded that the sett is inactive. Evidence of fox and otter was also recorded within the site. In addition, detailed bat and aquatic invertebrate assessments have been undertaken as part of the detailed baseline assessment. The detailed results of which are provided in technical appendices to this EIAR. No evidence of populations of these species being significant at more than a local level was recorded. No signs of any additional protected fauna were recorded within the study area during the field surveys.

No significant effects on surface water quality, groundwater quality or the hydrological/ hydrogeological regime were identified during either construction or operation.

Provided that the proposed development is constructed and operated in accordance with the design, best practice and mitigation that is described within this application, significant residual impacts on ecology are not anticipated.

Ornithology

Malachy Walsh and Partners were commissioned by SSE Renewables Ireland Limited to prepare a **Bird Impact Assessment Report** (BIAR) for the Glenora Wind Farm project (the "Proposed Development") which has been included as **Appendix 7-1** of this EIAR.

This non-technical summary provides an overview of the potential effects associated with the Proposed Development on ornithological features present at the proposed Glenora Wind Farm development. Field surveys were completed in order to determine the current breeding and non-breeding assemblage within the study area and were undertaken between 2019 and 2023.

The site itself is a commercial conifer plantation and as such does not contain particularly sensitive habitats or key populations of vulnerable bird species, taking account of publicly available bird sensitivity mapping and records, data supplied by NPWS, and the results of the bird surveys undertaken.

The most notable species recorded on site included kestrel, sparrowhawk, hen harrier, peregrine, buzzard, snipe, golden plover, woodcock and whooper swan. Further notable species, such as merlin, red grouse and teal were recorded in the wider environ of the site, within 2 km. Though outside the site, any potential impacts on ornithological interests in proximity to the site must also be considered.

The habitats present on site and/or within the wider environs are potentially suitable for breeding raptor species such as kestrel, sparrowhawk, merlin and buzzard, as well as species of wader such as snipe, golden plover, and woodcock, and gamebirds such as red grouse.

The site itself is not subject to any nature conservation designations. The closest Special Protection Area (SPA) is located approximately 10.3 km from the site. The Glenamoy Bog Complex Special Area of Conservation (SAC) (000500) is located approximately 150 m north of the wind farm site's northern boundary. This designated site is of importance for breeding merlin and golden plover, among other species. Neither merlin nor golden plover were recorded breeding within the proposed wind farm site.

Potential effects on species were assessed within both an EIA context and an AA context, due to the potential connectivity with birds which are qualifying features of SPAs. There will however be no direct impacts on protected areas such as SPAs and SACs. The NIS concluded that the integrity of the SPAs and SACs will not be adversely affected in view of the sites' conservation objectives.

The ornithological assessment identified habitat loss and disturbance during the construction phase, displacement and collision risk effects during the operational phase, and disturbance effects during the decommissioning phase, as potential impacts.

Unmitigated effects from construction activities on ornithological features were assessed as potentially significant during the breeding season for some birds of prey (sparrowhawk, buzzard, merlin, kestrel) and some upland breeding species (red grouse, golden plover, snipe and woodcock) owing to disturbance.

Unmitigated effects from operational activities on ornithological features were assessed as not significant for the bird of prey species, sparrowhawk and merlin, and the upland species red grouse with regard to potential displacement effects. Unmitigated displacement effects during operation were assessed as slight for hen harrier, buzzard, kestrel, golden plover and snipe.

The collision risks are low to moderate due to several factors related to bird species, numbers, and avoidance behaviour. Impacts due to potential collision risk range from moderate (golden plover and

kestrel) to slight (buzzard and snipe) to not significant (sparrowhawk, whooper swan, hen harrier, merlin and peregrine).

The cumulative effect of this development within the County Mayo region was assessed. No significant effects on birds are predicted with regard to cumulative impacts of the site, although there is potential for a cumulative effect with regard to wintering/migrating golden plover when considered with regard to other wind farms in the area and potential cumulative collision risk.

It is anticipated that any potentially adverse effects may be mitigated by design (including micro siting) and mitigation. To that end, a Project Ecologist with appropriate expertise and long-term ornithological experience will oversee pre-construction and construction phase bird surveys at the site, including the monitoring of breeding raptors and upland breeding species. All construction activities will be conducted in accordance with a Construction Environmental Management Plan (CEMP). Bird surveys will continue during the operational phase at locations used pre-construction.

With the avoidance measures (design phase), and full implementation of mitigation measures throughout the construction phase, operational phase, and decommissioning phase of the project, significant residual effects on birds are not expected.

Land, Soils and Geology

Fehily Timoney and Company (FT) was engaged by MKO to carry out an assessment of the potential impacts of the Glenora wind farm including its grid connection at Glenora, Co. Mayo (the 'Proposed Development') on the land, soil and geological environment.

The Quaternary Geology underlying the site predominantly comprises blanket peat with areas of till derived from Devonian and Carboniferous sandstones and areas of bedrock outcrop or subcrop also present in the centre of the site.

Peat depths recorded across the site by FT and MKO varied from 0.1m to 4.6m, with an average of 1.85m. Approximately 99 percent of peat depth probes recorded peat depths of less than 3.0m. The peat depths recorded at the turbine locations varied from 0.5 to 3.3m with an average depth of 1.9m.

The Geological Survey of Ireland (GSI) 1:100,000 scale bedrock geology map (Figure 8.2) shows that the Proposed Development site (including grid connection and TDR) is predominantly underlain by the Downpatrick Formation, the Minnaun Sandstone Formation and the Glencullin River Formation. Also present in a limited area in the northwest of the site are the Kanfinalte Formation, the Lugnalettin Black Schist Member, the Glenagh River Limestone Member and the Glencalry Schist Member.

Intrusive investigations were undertaken at the proposed borrow pit locations, at selected proposed turbine locations, and along the proposed access tracks. The purpose of the intrusive works was to confirm the geological succession underlying the site. The site investigations comprised the excavation of 13 no. trial pits to a maximum depth of 4.5m bgl.

The findings of the peat stability assessment showed that the proposed development has an acceptable margin of safety and is suitable for the proposed wind farm development. The findings include specific control measures (Section 13 of Appendix 8-1 of this EIAR) for construction work in peatlands to ensure that all works adhere to an acceptable standard of safety.

An analysis of peat stability was carried out at the turbine locations, roads, substation compound, construction compounds, borrow pits and met mast for both the undrained and drained conditions. The purpose of the analysis was to determine the Factor of Safety (FoS) of the proposed peat slopes during construction and operation.

An undrained analysis was carried out, which applies in the short-term during construction. For the undrained condition, the calculated FoS for load conditions (1) & (2) for the locations analysed, show that all locations have an acceptable FoS of greater than 1.3, indicating a low risk of peat failure. The undrained analysis would be considered the most critical condition for the peat slopes.

The peat stability risk assessment at each infrastructure location (as listed above) identified a number of specific mitigation/control measures to reduce the potential risk of peat failure. Sections of access roads to the nearest infrastructure element will be subject to the same mitigation/control measures that apply to the nearest infrastructure element.

In summary, the findings of the peat stability assessment showed that the site has an acceptable margin of safety, is suitable for the proposed wind farm development and is at low risk of peat failure. The findings include control measures for construction work in peatlands to ensure that all works adhere to an acceptable standard of safety.

Construction of the wind farm infrastructure will require the removal of peat, soil and rock to competent foundation. Excavation of bedrock from the proposed on-site borrow pit will provide material for access road, turbine bases and general hard-standing construction. 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.

A Peat and Spoil Management Plan (Appendix 4-2 of this EIAR) has been prepared for the development which details management of peat during construction works and long term storage thereafter. Peat removed during the excavation works will be deposited in the proposed on-site borrow pit and peat repository.

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

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

The geological 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

CDM Smith was engaged by MKO to undertake an assessment of the potential direct, indirect and cumulative effects of the Proposed Development on water aspects (hydrology and hydrogeology) of the receiving environment.

The Proposed Development is located in Glenora Forest in an upland bog setting which straddles the headwater subcatchments of the Owenmore and Ballinglen Rivers in Hydrometric Area 33. The streams that originate within and flow through the Wind Farm Site drain:

- South as the Altderg River before merging with the Oweninny River which, in turn, continues as the Owenmore River past Bellacorick and Bangor Erris to Tullaghan Bay on the sea, more than 30 km to the southwest.

- East as the Keerglen River before merging with the Ballinglen River which discharges to Bunatrahir Bay on the sea, approximately 7 km to the northeast.

The EPA has assigned a 'High' status objective to the Keerglen River water body. Based on EPA's latest ecological status classification period (2016-2021), the 'High' status objective was not met. The specific cause of this is not given, but EPA assigned a 'moderate biological status or potential' (specifically, 'moderate fish status or potential') while EPA's water quality test criteria were all met (hence, the classification is not caused by water quality).

The Wind Farm development is proposing measures that will protect the quality of surface water and existing aquatic habitat. The principal risks to water quality and associated aquatic habitats are associated with earthworks and drainage during the construction phase. To limit risk, mitigation measures are proposed which are proven from other wind farm sites and considered 'best practice' for wind farm developments. Mitigation involves the construction and establishment of a comprehensive drainage management system which intercepts pathways between potential sources of pollution (works areas) and receptors (streams). The drainage management system integrates new drainage with existing drainage in Glenora Forest, and is planned in such a way that it will maintain the hydrological balance of the Wind Farm Site. Drainage management with attenuation and settling basins also serves to address flood risk, which is low. It is noted that Glenora Forest is already extensively drained as part of ongoing commercial forestry operations. The existing drains serve to lead runoff from plantations to local streams.

Because Wind Farms involve near surface installations, potential effects on groundwater at the site are negligible, with few risks to groundwater resources. Surface water is the main receptor and is, therefore, the focus of the assessment of likely significant effects.

In addition to earthworks and drainage, there are other pollution risks to consider, such as potential spills and leaks of fuels and oils from machinery and equipment. These are common to any construction site, not just wind farms. All potential pollution sources will be carefully managed during construction, operations and decommissioning based on proven best practice methods.

To address identified risks, a wide range of drainage and pollution control measures, as well as other preventative measures, have been incorporated into the project design to protect surface water from significant adverse effects on water quality. All measures are incorporated in a construction and environmental management plan and a surface water management plan which are appended with the EIAR and will become part of contracts in the future, pending the outcome of planning application process.

The Proposed Development, which incorporates the Wind Farm Site in Glenora Forest and the Grid Connection Route to Tawnaghmore is indirectly connected to the Bellacorick Bog Complex SAC and pNHA, the Killala Bay/Moy Estuary SAC, SPA and pNHA, and Inagh Bog NHA. The assessment of likely significant effects does not identify any potential for likely significant effects to either of the designed sites. The Bellacorrick Bog Complex SAC and pNHA is downslope from the Wind Farm Site. There are no pathways that link the Proposed Development with habitats within the SAC. The habitats within the SAC boundaries are dependent on the hydrological and hydrogeological conditions within the SAC. Water within the SAC drains towards the Oweninny River. Hence, there will be no effects of the Proposed Development on the qualifying interests of SAC, neither during construction nor any other subsequent phase.

The grid connection route extends to Tawnaghmore and crosses rivers that are hydrology linked with and discharge into the Killala Bay/Moy Estuary SAC, SPA and pNHA. There is, therefore, potential for water pollution of the estuary although any pollution that would discharge into the estuary will be significantly attenuated by dilution/mixing. Moreover, there will be no earthworks at or immediately adjacent to stream crossings. The grid connection route crosses rivers through/across existing culverts and bridges, and horizontal directional drilling technology will be applied at 10 no. locations.

Earthworks will be managed using standard best practice techniques and there will be no direct discharges of any stormwater or swale water to any local watercourses.

The Inagh NHA is an area of upland blanket bog which borders the Wind Farm Site to the west. Although the NHA borders the Wind Farm Site, the NHA is both upgradient and sidegradient of the Wind Farm Site, and construction works will take place more than 100 m from the NHA boundary. For this reason, the NHA cannot be directly affected by the Proposed Development.

Mitigation measures described in Sections 9.4.2.1 through 9.4.2.10 will serve to protect the designated sites from any potential effects. The overall assessment concludes that with the proposed drainage management system and other mitigation measures, likely significant effects are not expected to occur, neither to surface nor groundwater water quality.

There are several other, existing wind farm developments within 20 km of the proposed Wind Farm Site. To date, there has been no discernible or identified effects from the existing wind farms on the WFD ecological status of associated water bodies.

With the exception of the Killala Community Wind Farm, the existing wind farms are either downslope of or in separate subcatchments from the Proposed Development. As such, they will not interact with Proposed Development. With regard to the Killala Community Wind Farm, this is situated within the same subcatchment of the Moyne River ('Moyne_010' river water body) that encompasses the Tawnaghmore grid connection point. The trenching associated with the Proposed Development will pass approximately 300 m south of Killala Community Wind Farm. Mitigation measures will be implemented as outlined in Sections 9.4.2.2 and 9.4.3.1 of the EIAR, and construction of the Tawnaghmore grid connection will be planned and coordinated in such a manner it will not interfere with the Killala Community Wind Farm operations. Hence, with mitigation measures, any likely significant residual cumulative effects of wind farm development are not significant.

With regard to existing forestry operations in the Wind Farm Site, these are subject to best management practices and licence conditions. Future forestry operations have the potential to influence water quality and biological conditions of local streams as a result of sediment mobilisation, transport, and re-sedimentation, and from potential fertiliser and pesticide applications. Effects can be both direct and indirect. The integration of the drainage management systems and the addition of both check dams and settlement ponds, along with diffuse discharges at greenfield runoff rates, will serve to reduce or mitigate risks of water quality effects.

With the implementation of mitigation measures and best practice methods on the part of both the Proposed Development and forestry operators, risks of effects are reduced and potential cumulative effects can be monitored, managed and mitigated. As such, significant residual cumulative effects are not likely to occur.

Air Quality

This chapter identifies, describes and assesses the potential significant direct and indirect effects on air quality arising from the construction, operation and decommissioning of the proposed development.

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

- Zone A: Dublin City and environs
- Zone B: Cork City and environs
- Zone C: 16 urban areas with population greater than 15,000
- Zone D: Remainder of the country.

These zones were defined to meet the criteria for air quality monitoring, assessment and management described in the Clean Air for Europe (CAFE) Directive (as amended) and the Fourth Daughter

Directive. The site of the proposed development lies within Zone D, which represents rural areas located away from large population centres.

Due to the non-industrial nature of the proposed development 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 vehicular and dust emissions.

A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-3 of the EIAR) and includes dust suppression measures. In addition, turbines and construction materials will be transported to the site on specified haul routes only. The agreed haul route roads adjacent to the site will be regularly inspected for cleanliness and cleaned as necessary.

Climate

This chapter identifies, describes and assesses the potential significant direct and indirect effects on climate arising from the construction, operation and decommissioning of the Proposed Development.

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 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 2023 (CAP 23), 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 CAP23, 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 CAP23 measures and further measures to be implemented.

The Proposed Development will have an export capacity of approximately 198MW and therefore will help contribute towards the achievement of national and international emission reduction targets. As well, it will provide much needed grid infrastructure and the capacity to offset 6,289,220 tonnes of carbon dioxide over its 35-year operational lifetime thereby reducing the greenhouse gas effect. Please see Section 11.5.2.1.2 of the EIAR for details on carbon offset calculations.

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 1.7.0 which was last updated in 2022. 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 wind farm in terms of potential carbon losses and savings, taking into account peat removal, drainage, and operation of the wind farm. The model calculates the total carbon emissions associated with the proposed wind farm development including manufacturing of the turbine technology, transport, construction of the development and carbon losses due to peatland disturbance.

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 CO2. It is essential therefore that any wind farm development in a peatland area saves more CO2 than is released. In relation to embodied carbon and associated transport movements of all other ancillary elements of the Proposed Development, the TII Carbon Tool has been utilised to assess the impacts of the Proposed Development in terms of potential carbon losses, and in particular construction phase transport emissions.

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

Noise

TNEI Services Ltd. has been commissioned to conduct an assessment into the likely environmental noise impacts of the Proposed Development.

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

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. Activities related to decommissioning would use similar plant to that used for construction activities and would occur at the same locations, as such noise level output during the decommissioning phase is expected to be no higher than the construction phase.

A background noise survey was undertaken at three 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.

The operational noise assessment was undertaken in three 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 (undertaking a cumulative noise assessment where required) and setting Site Specific Noise Limits for the Proposed Development.

Predicted cumulative operational noise levels indicate that for noise sensitive receptors neighbouring the Proposed Development, cumulative wind turbine noise (which considers noise predictions from all nearby operational and consented wind farms and the Proposed Development) would meet the Total WEDG Noise Limits at all Noise Assessment Locations.

The Total WEDG Noise Limit is applicable to all operational, consented and proposed (in planning) wind farms in the area so Site Specific Noise Limits have also been derived to control the specific noise from the Proposed Development. In accordance with the guidance in IOA GPG, the Site Specific Noise Limits have been derived with due regard to cumulative noise by accounting for the proportion of the Total WEDG Noise Limit which is potentially being used by other nearby developments. The Site Specific Noise Limits have been derived in accordance with the IOA GPG.

Predictions of wind turbine noise from the Proposed Development have been made in accordance with good practice using a candidate wind turbine with serrated trailing edge blades, a 162m rotor diameter and a hub height of 99m. Predicted operational noise levels from the Proposed Development indicate that for noise sensitive receptors neighbouring the Proposed Development, wind turbine noise from the Proposed Development would meet the Site Specific Noise Limits at all Noise Assessment Locations (NAL) and are therefore deemed to be not significant. In order to meet the noise limits at two receptors, mode management would be required for one turbine for certain wind speeds and wind directions based on the candidate turbine considered in this assessment.

The use of Site Specific Noise Limits would ensure that the Proposed Development could operate concurrently with other operational wind farm developments in the area and would also ensure that the Proposed Development's individual contribution could be measured and enforced if required.

The wind turbine model was chosen in order to allow a representative assessment of the noise impacts. Should the Proposed Development receive consent, the final choice of wind turbine would be subject to a competitive tendering process. The final choice of wind turbine would, however, have to meet the Site Specific Noise Limits presented in the noise assessment.

Landscape and Visual

The emphasis in this chapter is on the likely significant direct and indirect effects of the Proposed Development upon the landscape and visual amenity as well as landscape policy and relevant guidance. It covers the assessment methodology, a description of the Proposed Development and the existing landscape, as well as landscape policy and relevant guidance. It includes a description of the landscape policy of County Mayo with specific reference to wind energy and the Landscape and Visual Impact Assessment (LVIA) study area in which the Proposed Development Site is located.

The sensitive visual and landscape receptors with visibility of the Proposed Development were assessed based on site visits and using multiple tools and methods including the production of verified photomontages that follows best practice guidance for LVIA (see Appendix 14-1 for an overview of the methodology employed). Other tools such as ZTV mapping and Route Screening Assessment have also been employed to determine the likely potential and actual visibility of the proposal. No significant landscape or visual effects were recorded as a result of the Proposed Development.

The Proposed Development is located within an area that is surrounded to the north, west, and north-east by topographical features that provide substantial levels of screening in these directions. The siting of the proposed turbines at locations at a lower elevation than these features substantially reduce the visibility of the turbines. As a result, the visibility of the Proposed Development in these directions is limited to partial or no visibility, excepting areas in the immediate vicinity of the Proposed Development Site that are on the same sides of the hills that surround the proposed turbines, although there are extremely limited numbers of receptors at these locations. ZTV mapping and on-site surveys found that visibility of the Proposed Development is predominantly concentrated to the south and south-east of the Proposed Development Site, where flatter topography permits longer-ranging views. The ZTV map presented in Figure 14 1 illustrates the topographical screening described here.

The landscape area within which the Proposed Development is located is remote, with limited numbers of residential receptors and settlements. As a result, most locations, where there are both sensitive receptors and open visibility of the majority of the turbines in the Proposed Development, tend not to be located in close proximity, reducing the spatial extent and size of the turbines from sensitive locations where they are likely to be viewed from.

In terms of construction and operational phase landscape effects relating to designated landscape receptors (Landscape Policy Areas and Vulnerable Features – see Section 14.7.3.1.1 and Section 14.7.3.1.2), there were no significant landscape effects deemed to arise as a result of the Proposed Development and it was determined that the addition of the Proposed Development is consistent with the sustainable development of these areas and achieves the balance sought between the policies outlined in The Landscape Appraisal for County Mayo. As discussed in greater detail above, the Proposed Development will not fundamentally alter any of the key sensitivities of these LPAs, including any key scenic amenity attributable to the coastline or elsewhere.

In relation to Vulnerable Features, the Cloghmoyle and Maumakeogh Mountain ridgelines, and the Glenulra River, Keerglen River, Glencullen River, and the Oweninny River were assessed in order to determine whether the Proposed Development (Operational, Construction and Decommissioning Phase) would "impinge in any significant way upon its character, integrity or uniformity when viewed from the surroundings" (Section 3.1(b) of the Landscape Appraisal for County Mayo). Of all the designated vulnerable landscape features assessed in this section, including ridgelines and riverbanks, there are no Significant landscape effects deemed to arise. This is a result of the generally remote nature of the Proposed Development Site meaning that there is limited access to areas where there will be substantial visibility of the Proposed Development. Also, the proposed turbines are strategically sited at elevations lower than 230m AOD, which substantially mitigates their impact on adjacent ridgelines and creates substantial topographical screening of the Proposed Development from the riverbanks that are identified as potentially experiencing significant landscape effects. Overall, the Proposed Development will have no more than Slight residual landscape effects on the character, integrity and uniformity of the landscape features assessed in this section, particularly from scenic routes, which is noted as a particular concern in the Landscape Appraisal of County Mayo.

In terms of landscape character, the Proposed Development Site itself is of low landscape value and sensitivity given its current landcover and land use of commercial plantation forestry. In addition, the site is partially located within an area designated within the County Mayo RES as having areas of 'Tier 2 Open to Consideration' and 'Tier 1 Preferred (Large Wind Farms)'. Overall, taking into account its current use and remoteness, the topographical features surrounding the site, and the policy contained within the WES, the landscape of the Proposed Development site itself has a low sensitivity to wind energy development and no significant landscape effects will arise as result of the Proposed Development (further detail above in Section 14.7.3.1).

In terms of the wider landscape character of the LVIA Study Area (15km study area for effects on landscape character – see Section 14.2.1), there will be no 'Significant' or higher landscape effects. Two LCUs will experience 'Moderate' landscape effects as a result of the Proposed Development. LCU E – North Mayo Mountain Moorland, in which the majority of the Proposed Development is located, will experience direct effects on landscape as a result of the Proposed Development. This is a large LCU

(approx. 543km2), and the footprint of the Proposed Development will only materially alter a small proportion of the landscape area, and so landscape effects on the physical fabric of the LCU are very localised. In addition, the Proposed Development will not be visible from the vast majority of this LCU, with visibility restricted to the localised area around the Proposed Development and some relatively small areas to the southwest of the Proposed Development Site. Therefore, the effects on its landscape character will be 'Moderate'. This is outlined in greater detail above in Section 14.7.3.1.5 and within Appendix 14-2).

The other LCU that will experience a 'Moderate' landscape effect as a result of the Proposed Development is LCU D – North Coast Plateaux. This can be attributed more to its highly sensitive landscape receptors located on the coast as opposed to actual visibility of the proposed turbines from within the overall LCU, which is quite limited. Likely landscape effects are substantially mitigated by topographical screening and distance from the Proposed Development. In particular it is noted that there is no visibility from the Céide Fields, the most sensitive receptor in this LCU.

The Proposed Development is also partially located within LCU F – North Mayo Inland Bog Basin. This LCU has a 'Not Significant' effect as a result of the Proposed Development, given the existing levels of wind energy development within this LCU, and the overall character and sensitivity of the area. All other LCU's in the LVIA Study Area for effects on landscape character will experience a 'Slight' or 'Not Significant' effect.

In terms of cumulative landscape effects, only LCU E – North Mayo Mountain Moorland, where the majority of the Proposed Development is located, will experience a change in the cumulative status attributed to it, with a change in the status from '2. Landscape Character Area with occasional wind turbines in it and/or intervisible in another landscape character area/s' to '3. Landscape character area with wind turbines.' However, it is noted that the topography surrounding the site provides screening of the proposed turbines from much of the LCU. There is no change to the cumulative status of the other LCUs located within the LVIA Study Area. Therefore, significant cumulative effects on landscape character are not considered to arise.

The visual assessment concluded that residual visual effects of "Moderate" was deemed to arise at one of the eleven viewpoint locations. All other viewpoints were assessed as resulting in Slight (8) and Not Significant (2) residual visual effects. Furthermore, it was shown that the potential for actual visibility is greatly restricted by the strategic siting of the Proposed Development in a saddle between peaks, as well as commercial forestry and vegetated agricultural land to the southeast. As demonstrated in the Photomontage booklet (Volume 2) and photomontage assessment tables (Appendix 14-3), the proposed turbine locations, spacing, and heights have been appropriately selected for the Proposed Development Site, and design of the Proposed Development adheres to the guidance for the siting of wind farms in Mountain Moorland Landscape Types, as set out in the WEDGs (DoEHLG, 2006), & Draft WEDGs (DoPHLG, 2019). In addition, the majority of the areas where there is visibility of the proposed turbines are the least sensitive locations within the LVIA Study Area, and where there are already a large number of permitted and existing wind farms visible. In particular, it is noted that the Proposed Development does not obstruct landscape views of the North Mayo coastline and does not substantially impact scenic amenity attributed to the coast.

7 no. designated scenic routes and highly scenic vistas, along with a number of other sensitive visual receptors were assessed as part of this visual assessment. There were no significant effects found to occur at visual receptors in the LVIA study area. Viewpoint 3 – Downpatrick Head, which is a highly sensitive visual receptor as a result of its popularity as a tourist destination, and as an OSi viewpoint, was deemed to experience a 'Moderate' residual visual effect. From this location the majority of the proposed turbines are visible, however, given the distance of approx. 11 km between the turbines and the viewpoint, they take up a limited horizontal extent within the less scenic part of the view and appear as small elements in the background. The 'Moderate' effect finding here is primarily related to the sensitivity of the receptors represented by the viewpoint. All other scenic routes were deemed to experience no more than a 'Slight' visual effect.

In terms of other sensitive visual receptors, such as recreational and tourist destinations, settlements, and transport routes, the visual effects were found to be 'Slight' or 'Not Significant' for the majority of these. Downpatrick Head, also identified as a tourist destination was deemed to experience a 'Moderate' visual effect, as discussed above.

The Western Way walking route, which passes through the Proposed Development Site itself will also experience a 'Moderate' residual visual effect, including some cumulative effects as a result of the proposed Sheskin South and permitted ABO Sheskin wind farm developments, and the Proposed Development. There will be a substantial magnitude of change to the character of the section of the walking route that passes through the Proposed Development Site. Overall, however, considering the overall length of the route and the relatively small section where the proposed turbines are located, the Proposed Development will not cause significant visual effects on this route.

In relation to residential visual amenity, it is emphasised that the proposed turbines are located over twice the required set-back distance from the nearest residential property, with topographical screening also mitigating any effects on residential visual amenity. There are no significant effects deemed likely to arise in relation to residential visual amenity as a result of the Proposed Development.

Cumulative visual effect are likely to arise given the addition of the Proposed Development within a landscape area where multiple other wind farms are located. The proposed turbines will be seen in the same viewshed as other adjacent wind farms, with cumulative visibility tending towards views of the proposed Sheskin South turbines in combination with other turbines, as opposed to sequential views along routes (although these do occur along the R315, as detailed above). The addition of the Proposed Development increases the density of turbines visible within these typical combined views, although in general the Proposed Development is viewed as a much smaller background feature than the closer wind farms visible from the south and southeast. It is relevant that the topography surrounding the Proposed Development Site is large scale, which increases the ability of the landscape within which the turbines are viewed to absorb the development, mitigating the additional visual cumulative effects. For the landscape character type where the proposed turbines are located, Mountain Moorland, the character of the landscape as an expansive, wide-ranging landscape is accepting of cumulative effects, whether wind farms are seen as discrete elements, standing in relative isolation, or as collective units made up of two or more developments (see Section 14.4.3). The latter is the case with the proposed turbines when they are viewed from certain directions (south-east and east).

A Cumulative Comparative ZTV (Figure 14-17 above) shows that the additional cumulative visibility over that of the proposed, existing, and permitted turbines within the LVIA Study Area only increased in a small number of areas due to the addition of the Proposed Development. There are limited visual receptors in the additional areas indicated on the Cumulative Comparative ZTV map, aside from the stretch of coastline surrounding Downpatrick Head and visual effects on this location have been assessed (see VP3) above with consideration given to cumulative impacts and no Significant effects were found. Therefore, it is considered that the Proposed Development will not have a Significant effect on the extent of cumulative visibility within the LVIA Study Area.

The landscape character of the area within which the Proposed Development Site is located is one of a large scale which contains open, expansive views, and these assist in allowing the landscape to accommodate a large number of turbines, which a detailed visual assessment outlined above (Section 14.7.3.4) and in the photomontage assessment tables contained in Appendix 14-3 has covered in detail.

In conclusion, the Proposed Development is an appropriately designed and suitably scaled project, and likely landscape and visual effects are deemed to not be Significant.

Archaeology and Cultural Heritage

The Cultural Heritage chapter was prepared by Tobar Archaeological Services Ltd. It presents the results of an archaeological, architectural and cultural heritage impact assessment of the Proposed

Development. The assessment was based on desktop research, field surveys, GIS based mapping, ZTV and was also assisted by photowire images from certain assets. A detailed examination of the available baseline data was undertaken in addition to a comprehensive site inspection. The latter comprised a walk-over survey of the Proposed Development Site and any proposed infrastructure therein and a windscreen survey of the proposed underground electrical cabling route and the proposed TDR.

No recorded cultural heritage assets, including UNESCO WHS or those on a tentative list, National Monuments, recorded monuments, Protected Structures or NIAH sites are located within the Proposed Development site and no direct impacts to same will occur. Where potential impacts have been identified, such as to potential sub-surface archaeology, appropriate mitigation measures will be implemented in full in order to minimise any such impacts. Mitigation includes pre-development archaeological testing of the proposed wind farm infrastructure (turbine bases, hardstands, compounds, new roads, etc) once clear-felling of forestry has taken place, and archaeological monitoring of ground works during the construction stage of the project. Buffer zones will also be established around features of local cultural heritage merit within the Proposed Development boundary.

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. No UNESCO WHS or those on a Tentative List are located within 20km of the nearest proposed turbine.

All cultural heritage assets within 100m of either side of the proposed underground electrical cabling route were assessed for potential impacts to same. No direct impacts to the recorded archaeological, architectural or cultural heritage resource as a result of the grid connection route have been identified. Mitigation measures will be implemented where deemed appropriate and include archaeological monitoring of ground works within the Zone of Notification around recorded monuments.

An assessment of potential cumulative effects was also undertaken taking into consideration other extant planning applications and operational 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 operational 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.

Material Assets

Traffic and Transport

An assessment of the traffic effects was undertaken for the proposed Glenora Wind Farm Development. The Proposed Development consists of 22 wind turbines and is located approximately 6km southwest of Ballycastle and 19km north of Crossmolina. The Proposed Development site entrance is accessed off an unnamed local road approximately 6 km west of the R314 Regional Road.

The assessment considers the likely impacts resulting from The Proposed Development during the construction, operational and decommissioning stages. The impact that traffic generated by the Proposed Development would have on the local highway network is addressed, in addition to an assessment of the route geometry with respect to accommodating the abnormally sized vehicles required to deliver the turbine plant to the site.

Traffic Route & Study Area

The delivery route to the site for the abnormally sized loads required to transport the turbine components to the site (blades, towers and nacelles) commences at the Port of Galway followed by a route through Galway City including the Monivea Road, Connolly Avenue and Tuam Road. The route

then turns right onto the N6 heading east out of the city to the Coolagh Roundabout. From this point the route heads north on the M17 to Tuam bypassing the town via the Tuam Bypass. The route then heads north on the N17 through the villages of Milltown, Ballindine, Knock and Killkeely before heading west on the N5 at Charlestown towards the village of Ballyvary. The route continues north through Foxford to Ballina, where it heads west on the N59 through Crossmolina.

From Crossmolina the route continues west on the N59 to the sharp bend located at Bellacorick. At this location it is proposed to use the existing bypass that has been constructed for the purpose of turbine delivery in the townland of Moneynieren. The route then continues west on the N59 passing through bends at Ballymunnelly before continuing in a northwest direction on the R313 at Bangor-Erris.

The route continues on the R313 before turning right at a priority junction onto the L1204 near Attavally. From this location the route heads north on the L1204 before turning right at the priority junction with the R314. The route then progresses east on the R314 before turning right onto a new road at a location approximately 0.6kms northwest of Ballycastle. The new link road then links into the local Ballyglass local road. The route then travels west on the unnamed road in Ballyglass before heading southwest at a Y-junction to access the Proposed Development site.

The delivery route(s) for general construction traffic including site staff and heavy goods vehicles (HGVs) may vary depending on the location of the suppliers used for concrete and other materials required to construct the Proposed Development. Based on the location of suppliers in the vicinity of the Proposed Development, it is estimated that concrete and general construction traffic may travel towards the site via the R314 to the east and west, or the R315 to the east, and that these roads then link into the national road network via the N59.

Vehicle types and network geometry

The types of vehicles that will be required to negotiate the local network will be up to 92.7 metres long and will carry a blade 81.0 metres in length. At locations where geometry is constrained (the majority of the TDR from Foxford and Ballina, to the site access off the R314) it is proposed to raise the turbine blade vertically using a specialised blade adaptor.

An assessment of the geometric requirements of the delivery vehicles was undertaken on the delivery routes. Locations where it was established that the existing road geometry will not accommodate all of the vehicles associated with the proposed development 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

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

- On the 22 days when the concrete foundations are poured construction generated traffic will result in an increase in traffic levels between +17.0% on the N59 between Ballymunnelly and Ballina, to +9.2% on the N59 just to the west of Ballymunnelly. On the R314 just to the north of Ballycastle it is forecast that traffic flows will increase by 30.1%. Travelling towards the site on the Killerduff Road, due to background traffic volumes being low, it is forecast that traffic volumes will increase by a factor of 6. As a result of the additional 440 pcus that will travel on the network on these days it is forecast that there will be a temporary, slight, negative impact on general traffic using the surrounding road network.

- During the remaining 299 days for the site preparation and ground works when deliveries to the site will take place, the effect on the surrounding road network will be negative and will be between 6.5% on the N59 between Ballymunnelly and Ballina and +3.5% just to the west of Ballymunnelly. On the R314 just to the north of Ballycastle it is forecast that traffic flows will increase by 11.5%. Travelling towards the site on the Killerduff Road it is forecast that traffic volumes will increase by 171.7%. As a result of the additional 121 pcus that will travel on the network on these days it is forecast that there will be a temporary, slight, negative impact on general traffic using the surrounding road network.
- During the 40 nights when the various component parts of the wind turbine plant are delivered to the site using extended articulated HGVs, the effect of the additional traffic on these days will be moderate due to the size of vehicles involved, resulting in increased traffic volumes between +1.2% on the N17 between Tuam and Claremorris to +2.0% on the N58 between Ballylahan and Foxford, to +5.4% on the N59 between Crossmolina and Bangor-Ennis. On the R314 just to the north of Ballycastle it is forecast that traffic flows will increase by 9.6%.
- The assessment assumes that the large turbine components will be delivered during daytime hours and reflects the most conservative scenario. The direct effect will be reduced from moderate to slight if the delivery of the large plant will be done during nighttime hours, as is proposed. As it is the industry norm to make these deliveries during nighttime hours the impacts incurred by existing traffic on the local highway network will be negative, temporary (over 20 nights) and will be slight.
- During the 22 days of the turbine construction stage when general materials are delivered to the site, the additional 55 PCUs on the road network will result in increased traffic volumes between +0.5% on the N17 between Tuam and Claremorris to +0.8% on the N58 between Ballylahan and Foxford, to +2.1% on the N59 between Crossmolina and Bangor-Ennis. On the R314 just to the north of Ballycastle it is forecast that traffic flows will increase by 3.8% and on the local Killerduff Road by 56.2%. The effect during this period will be temporary and will be imperceptible.
- Of all of the links assessed on the delivery route it was determined that the N58 between Ballylahan and Foxford is forecast to operate over link capacity (141%) by the year 2028 for the do-nothing scenario. It is forecast that during the construction of the Proposed Development, the most substantial impact will occur during the 40 days when the abnormal turbine loads are delivered to the site, when this is forecast to increase to 144%. For the majority of the construction phase there will be no impacts on this link as concrete and general construction material will be sourced closer to the site. While the assessment indicated that this section of the N58 will operate over capacity by the year 2028, the impacts of the construction traffic generated by the Proposed Development will be negative, slight and will be temporary.
- • It was determined that the junction between the R314 and Killerduff Road will operate within capacity for all days within the construction period.

Once the facility is operational the traffic impact created by maintenance staff will be negligible.

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, affecting, for example, radio signals. The most significant potential effect occurs where the wind farm is directly in line with the transmitter radio path.

The proposed development will have no significant effects on Telecommunications and Aviation once mitigation measures, outlined in Chapter 15 of this EIAR, are implemented. During the development of any large project that holds the potential to effect telecoms or aviation, the Developer is responsible for engaging with all relevant Telecoms Operators and the relevant Aviation Authorities to ensure that the

proposal 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 mitigatory measures are in place.

In summary, there will be no significant impact on telecommunications and aviation as a result of the proposed development.

Vulnerability of the Project to Major Accidents and Natural Disasters

This section of the Environmental Impact Assessment Report (EIAR) describes the likely significant effects on the environment arising from the vulnerability of the Proposed Development as detailed in Chapter 4 to risks of major accidents and/or natural disasters.

Major accidents or natural disasters are hazards which have the potential to affect the Proposed Development and consequently have potential impacts on the environment. These include accidents during construction and operation caused by operational failure and/or natural hazards. The assessment of the risk of major accidents and/or disaster considers all factors defined in the EIA Directive that have been considered in this EIAR, i.e., population and human health, biodiversity, land, soil (peat stability), water, air and 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 this EIAR,

The scenario with the highest risk score in terms of the occurrence of major accident and/or disaster was identified as 'Contamination' of the Proposed Development site and risk of 'Industrial Accident-Fire/Gas Explosion' during the construction, operation and decommissioning phases.

The Proposed Development has been designed and built in accordance with the best practice measures set out in this EIAR and, as such, mitigation against the risk of major accidents and/or disasters is embedded through the design.

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

Interactions of Effects

Chapters 5 to 15 of this EIAR identify the potential significant environmental effects that may occur in terms of Population and Human Health, Biodiversity, Ornithology, Land, Soils and Geology , Hydrology and Hydrogeology, Air Quality, Climate, Noise, Landscape and Visual, Cultural Heritage and Material Assets, as a result of the proposed development. All of the potential significant effects of the proposed development and the measures proposed to mitigate them have been outlined in the main 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. A matrix is presented in Chapter 17 of the EIAR to identify interactions between the various aspects of the environment already discussed in the EIAR. The matrix highlights the occurrence of potential positive or negative impacts during both the construction and operational phases of the proposed

development. Where any potential interactive impacts have been identified, appropriate mitigation is included in the relevant sections (Chapters 5–15) of the EIAR.