Environmental Impact Assessment Report (EIAR)

Cunlaghfadda Green Energy Project, Co. Mayo

Chapter 17 - Interactions of the Foregoing

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17. INTERACTIONS OF THE FOREGOING

17.1 Introduction

The preceding Chapters 5 to 16 of this EIAR identify the potential significant environmental effects that may occur in terms of Population and Human Health, Biodiversity (Flora and Fauna), Birds, Land, Soils and Geology, Water, Air Quality, Climate, Noise and Vibration, Landscape and Visual, Archaeological, Architectural and Cultural Heritage, Material Assets (Roads and Traffic, Telecommunications, Aviation, Utilities and Waste Management), and Vulnerability to/from Major Accidents and Natural Disasters as a result of the Proposed Project, as described in Chapter 4 (Description of the Proposed Project) of this EIAR. All of the potential significant effects of the Proposed Project and the measures proposed to mitigate these have been outlined in the preceding chapters of this EIAR. Mitigation measures and best practice measures for the construction, operation and decommissioning of the Proposed Project are detailed in the accompanying Construction and Environmental Management Plan (CEMP) (Appendix 4-5), and Chapter 18 Schedule of Mitigation and Monitoring Measures. 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.

Article 3 of EIA Directive 2011/92/EU as amended by Directive 2014/52/EU sites that the environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors: (a) population and human health; (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC; (c) land, soil, water, air and climate; (d) material assets, cultural heritage and the landscape; (e) the interaction between the factors referred to in points (a) to (d). The assessment in this chapter assesses the interaction between the relevant assessments in this EIAR.

A matrix is presented in Table 17-1 below to identify potential interactions between the various aspects of the environment already assessed in this EIAR. The matrix highlights the occurrence of potential positive or negative effects during both the construction (C) and operational (O) phases. It is considered that the potential effects during the decommissioning phase will be similar to the construction phase but of a lesser magnitude and therefore has not been included in Table 17-1 below. In Section 17.2 below, the potential interactions between each environmental component have been discussed in order of the relevant chapters of the EIAR. Once a potential interaction between two environmental components has been discussed, for example, Population & Human Health and Water, the interaction will not be discussed again in the following relevant section, therefore there is no Water and Population & Human Health section.

Table 17-1 Interaction Matrix: Potential for Interacting Impacts

	Phase	Population and Human Health	Biodiversity	Birds	Land, Soils and Geology	Water	Air Quality	Climate	Noise and Vibration	Landscape and Visual	Cultural Heritage	Material Assets	Major Accidents & Vulnerability to Natural Disasters
Population and Human Health	C												
	O												
Biodiversity	C												
	O												
Birds	C												
	O												
Land, Soils and Geology	C												
	O												
Water	C												
	O												
Air Quality	C												
	O												
Climate	C												
	O												
Noise and Vibration	C												
	O												
Landscape and Visual	C												
	O												
Cultural Heritage	C												
	O												
Material Assets	C												
	O												

Major Accidents and Vulnerability to Natural Disasters	C												
	O												

Legend: No Interacting Effect: Positive Effect:
Neutral Effect: Negative Effect:

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

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

17.1.1 Statement of Authority

This section of the EIAR has been drafted by Joye Atkinson reviewed by Natalia Stolarska, Órla Murphy all of MKO.

Joye is a Graduate Environmental Scientist with MKO with over one year of professional consultancy experience and holds a BSc (Hons) in Social Science from University College Dublin. Prior to joining MKO, she completed a one-year internship with RMLA Planning, where she contributed to a range of projects across both the public and private sectors. Joye's core strengths include drafting Environmental Impact Assessment Report (EIAR) chapters, as well as strong report writing skills, with the ability to present complex environmental data clearly, concisely, and in line with regulatory requirements. At MKO, Joye's work focuses on report writing, EIAR chapter preparation, and GIS-based mapping. She has contributed to multiple onshore wind projects across Ireland, supporting both technical analysis and environmental assessment.

Natalia Stolarska is a Project Environmental Scientist within the environment renewables team in MKO with over 2 years' of professional experience as an environmental consultant. Natalia holds a BSc in Earth and Ocean Science and an MSc in Environmental Leadership. Natalia's key strengths and areas of expertise are in managing wind farm EIAR projects, drafting and reviewing of EIAR chapters, wind farm feasibility studies and QGIS mapping. Since joining MKO Natalia has also been involved in coordinating environmental site work for a wide range of developments, assisting in stakeholder engagement, scoping exercises, organising, attending and leading pre-application meetings with local authorities and An Coimisiún Pleanála. Natalia also holds a membership with the Institute of Sustainability and Environmental Professionals (ISEP).

Órla works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments as well as sub-contractors from various fields in the preparation and production of EIARs. Órla Murphy is a Senior Environmental Scientist with McCarthy Keville O'Sullivan Ltd. with nearly 10 years of experience in private consultancy. Órla holds a BSc (Hons) in Geography from Queens University Belfast & a MSc in Environmental Protection and Management from the University of Edinburgh. Prior to taking up her position with McCarthy Keville O'Sullivan in January 2018, Órla worked as an Environmental Project

Assistant with ITPEnergised in Scotland. Órla's key strengths and areas of expertise are in Environmental Protection and Management, EIA, Project Management, Renewable Energy and Peatland Management, where she has carried out research projects and site work relating to restoration and management of peatland sites in both Scotland and Northern Ireland. On joining MKO, Órla has been involved on a range of renewable energy infrastructure projects. In her role as a project manager, Órla works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments as well as sub-contractors from various fields in the preparation and production of EIARs. Within MKO, Órla plays a role in the management of and sharing of knowledge with junior members of staff and works as part of a large multi-disciplinary team to produce EIA Reports.

17.2 Impact Interactions

17.2.1 Population and Human Health

Population and Human Health and Land, Soils & Geology

Construction Phase

During the construction phase there may be slight interference with agricultural practices and turbary peat cutting within the EIAR Site Boundary. Due to the small footprint of the Proposed Project on a Site of 165 ha, the residual effect is considered to be a negative, short-term, slight, effect on land use and activities.

Operation Phase

A wind farm and associated grid infrastructure is not a recognised source of pollution and so the potential for effects during the operational phase are imperceptible. With the implementation of mitigation and monitoring measures detailed in Section 8.6.3 of Ch. 8 Lands, Soils & Geology and the CEMP (Appendix 4-5), the potential for residual effects associated with soil or ground contamination during the operational phases and subsequent health effects are negative, imperceptible, indirect, long-term, and unlikely.

The permanent footprint of the Proposed Project will occupy only a small percentage of the Site; 5.5ha (3%) of the overall 165 hectare Site. Farming practices will not be impacted during the operational phase. The addition of new access tracks throughout the Site will enable access for landowners throughout their lands, this will consist of 3.7km for the Proposed Project and 2.85km for the Proposed Wind Farm and 850m for the Proposed Grid Connection. The small scale of the underground cabling is located entirely within private land (982m), and its ability to coexist with ongoing site activities and activities within the landscape indicate that the Proposed Project infrastructure will have no significant impact on other land-uses within the Site and the wider area. Due to the small permanent footprint of the Proposed Project infrastructure on a site scale and even more so on a local scale, the residual impact is considered a long-term, slight, positive, direct effect on land use and activities during the operational phase.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration.

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Population and Human Health, and Water

Construction Phase

The construction phase ground works and use of plant on site may give rise to the potential release of suspended solids and hydrocarbons into surface and groundwaters.

There are no mapped groundwater source protection areas for Public Water Supplies (PWS) or Group Water Schemes (GWS) in the Site or in the surrounding lands. GWSs were included for the purposes of a conservative impact assessment in Chapter 9 Water. The Site does not fall within the Claremorris urban wastewater treatment catchment. There are no private wells located within the Site.

With the implementation of the drainage design and all mitigation measures listed in Chapter 9 Water (section 9.5.2); separation distances, prevailing geology, topography and groundwater flow directions, it is considered that there will be an indirect, negative, slight, long-term and unlikely effect on water quality.

Operation Phase

During the operational phase of the Proposed Project, all permanent drainage controls will be in place, and the disturbance of ground and excavation works will be complete. Some minor maintenance works may be completed, such as maintenance of Site entrances, access tracks and hardstand areas. These works would be of a very minor scale and would be very infrequent. During such maintenance works there is a small risk associated with the release of hydrocarbons from Site vehicles, although it is not envisaged that any significant refuelling works will be undertaken on site during the operational phase. With the implementation of the Site drainage design and mitigation measures the residual effects on human health due to water quality are considered to be negative, imperceptible, indirect, temporary, and unlikely.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration.

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Population and Human Health, and Air Quality

Construction Phase

An increase in dust and exhaust emissions has the potential to cause a nuisance to sensitive receptors in the immediate vicinity of the Site. The transport of stone to be transported into the Site also has the potential to create dust, which could affect nearby sensitive receptors. With the implementation of the outlined mitigation and monitoring measures in Section 10.3.2.2 of Chapter 10 Air Quality for the construction phase, residual effects on air quality from dust and exhaust emissions associated with construction activities and machinery are considered to have a short-term, imperceptible, negative effect on air quality.

Operational Phase

The sources of dust and other emissions generated during the operational phase will be from infrequent visits by maintenance staff in light good vehicles (LGVs) approximately one or two visits per day. This will have a potential long-term, imperceptible negative impact on health during the operational phase. Over the envisaged 35-year lifespan of the Proposed Project it is expected to effectively reduce carbon

dioxide emissions that would have occurred if the same energy was generated by traditional fossil fuel plants. Overall, considering offsetting of dust and greenhouse gas emissions from fossil fuels as a result of the Proposed Project, there will be a long-term overall moderate, positive effect on air quality.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration.

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Population and Human Health, and Climate

Construction Phase

The construction of the Proposed Project will have a short-term, imperceptible, negative effect on climate and will be restricted to the duration of the construction phase. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from construction phase activities will have a permanent imperceptible, negative effect on Climate and therefore population and human health.

Operational Phase

The Proposed Project when in operation, will reduce the input of carbon intensive energy into the national grid and reduce the amount of greenhouse gas emissions being released to the atmosphere. Harnessing more energy by means of renewable sources will reduce dependency on fossil fuels, thereby resulting in a reduction in harmful emissions that can be damaging to human health and the environment. For the purposes of this EIAR, a rated output of 4.5MW per turbine has been chosen to calculate the anticipated power output of the proposed turbines, which would result in an estimated output of 31.5MW, displacing approximately 19,731 tonnes of carbon dioxide per annum from traditional carbon-based electricity generation. This will have a long-term moderate positive impact on climate.

The operation of the Proposed Project will displace 19,731 tonnes of carbon dioxide per annum from fossil fuel-based electricity generation, 690,588 tonnes over the proposed 35-year operational lifespan due to the provision of clean, renewable energy to the national grid. Therefore, while there will be greenhouse gas emissions associated with the operation of the Proposed Project, this will be offset by the Proposed Wind Farms operation over its 35-year operational life.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration,

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Population and Human Health and Noise and Vibration

Construction Phase

As identified in Chapter 5 Population & Human Health of this EIAR, there will be an increase in noise levels in the vicinity of the Site during the construction phase, as a result of heavy machinery and

construction work which has the potential to cause a nuisance to sensitive receptors located closest to the Site. The noisiest construction activities associated with wind farm development are excavation and concrete pouring of the turbine bases, and the extraction of stone from the borrow pits. Noise from the borrow pit excavation and reinstatement will be in the form of blasting and rock breaking operations this is further discussed in Section 12.6.2 of Chapter 12. Excavation of a turbine base can typically be completed in one to two days however, and the main concrete pours are usually conducted in one continuous pour, which is done within a matter of hours. These effects will be short-term in duration. Construction noise at any given noise sensitive location will be variable throughout the construction of the project, depending on the activities underway and the distance from the main construction activities to the receiving properties. The potential noise impacts that will occur during the construction phase of the Proposed Project are further described in Chapter 12 Noise and Vibration.

With the implementation of the mitigation measures outlined in Section 12.7.1 of Chapter 12, there will be a negative, not significant and short-term residual effect due to noise and vibration arising during the construction phase of the Proposed Project and is therefore Not Significant.

Operational Phase

An assessment of the operational wind turbine noise levels has been undertaken in accordance with best practice guidelines and procedures as outlined in Chapter 12 Noise and Vibration. The predicted noise levels associated with the Proposed Project will be within best practice noise criteria curves recommended in the Guidelines (DoEHLG, 2006). The level of noise from the Proposed Grid Connection underground cabling route, which is located within the Site will be negligible. The predicted residual operational turbine noise effects at the closest noise sensitive locations range from imperceptible to not significant. Please see Chapter 12 Noise and Vibration for details.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration.

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Population and Human Health, and Landscape and Visual

Construction Phase

The construction phase of the Proposed Project will see the temporary introduction of construction machinery and the erection of wind turbines into a natural but already modified landscape. The erection of the proposed turbines in particular will change the existing landscape. The construction activities may potentially cause temporary impacts on the landscape such as the creation of temporary structures, dust, soil erosion and alterations to drainage. It is considered that the construction phase will have a 'Moderate', 'Short-term', 'Negative' effect in terms of direct landscape effects

Operational Phase

There are no significant landscape attractions within or adjacent to the Site that could be affected by the operation of the Proposed Project. The nearest tourist attraction to the Proposed Project is the Land of the Giants at McMahon Park, Clare Lake, Claremorris, Co. Mayo, located c. 5.5km southwest of the Site. There will be no theoretical or actual visibility of the Proposed Wind Farm from this location, as outlined in Chapter 13. Within the LVIA Study Area, the visual impact on residential receptors ranges from 'Imperceptible' to 'Moderate' (for a small number of residential receptors) There will be an adherence to the 4x tip height set -back distance to protect visual amenity. The effect on tourism in the wider landscape due to the operational phase of the Proposed Project will be Not Significant. It is

considered that the Proposed Project will have a negative, slight, long-term, residual on the wider landscape.

Decommissioning Phase

During the decommissioning phase of the Proposed Project, turbine foundations would remain in place underground and would be covered with earth and allowed to revegetate. This naturalisation process shall revert the landscape of the Site back to a condition similar to the current landscape baseline. Removal of the proposed turbines and ancillary infrastructure (except the proposed substation) from the Wind Farm site during decommissioning will result in short-term, slight, negative visual effects.

On this basis, while Significant effects are identified at two viewpoint locations, these effects are very localised. On balance the overall effect on Scenic Routes, Views and Prospects are not significant.

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Population, and Human Health and Material Assets

Construction Phase

During the construction phase, the Proposed Project will give rise to traffic movements of abnormal loads and increased traffic volumes on the local road network and, therefore, is likely to create a short-term slight negative effect for other road users as well as dust and exhaust emissions. Traffic Management plan is included as an Appendix (15-2) as part of Chapter 15 and will be updated and agreed with Mayo County Council prior to construction to minimise all disruption, as described in Chapter 15 Material Assets and the CEMP (Appendix 4-5). It is considered that the construction phase will have a short-term, slight to moderate negative effect as a result of traffic movements. Once a traffic management plan is implemented for the construction phase of the Proposed Project, there will be a slight, short-term, negative residual effect on local road users.

Operational Phase

During the operational phase, impacts on the surrounding local road network will be long term negative imperceptible impact. With the implementation of measures detailed in Chapter 5 Population & Human Health and the CEMP (Appendix 4-5) dust and exhaust emission will be contained and the potential for impact on health will be imperceptible.

During the operational phase, there will be no impacts or associated effects on built services or telecommunications associated with the Proposed Project. The Proposed Project will have a long-term imperceptible, negative, residual effect on telecommunications and aviation assets during the operational phase.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration,

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

17.2.2 Biodiversity

Biodiversity, and Birds

Construction Phase

Site activities during the construction phase of the Proposed Project may have the potential to give rise to disturbance and deterioration of habitat to birds and their prey species. An overview of survey data is included in Appendix 7-3 (Summary Data) with detailed maps provided in Appendix 7-4 (Survey Data). Survey data and maps relating to roost sites are provided in Appendix 7-5 (Confidential Survey Data). Potential impacts on Key Ornithological Receptors (KORs) are included in Section 7.4.2 of Ch. 7 Birds. Potential effects during the construction phase range only from imperceptible to slight, negative and long term during the construction phase.

Operational Phase

A Biodiversity Management and Enhancement Plan (BMEP) is included in this EIAR (see Appendix 6-4). It is proposed to enhance and manage 2.5km of hedgerow/treeline planting and enhancement on site, 3.5ha of native broadleaved woodland planting on site, enhancement of 1.16ha of Molinia meadow. The BMEP works will have a positive, slight, direct, permanent likely effect on the land environment which will have a subsequent indirect slight positive long term impact on birds.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Biodiversity and Land, Soils & Geology

Construction Phase

The removal of conifer forestry and linear vegetation and the excavation of peat and spoil during the construction phase of the Proposed Project is likely to result in the disturbance of flora and fauna in and adjacent to the Proposed Project footprint thereby, potentially causing a short term, slight, negative effect on flora and fauna. These potential impacts have been assessed in Ch. 6 Biodiversity of this EIAR, and excavated peat and spoil will be contained on site in the designated peat and spoil management areas (Appendix 4-3 contains the Peat and Spoil Management Plan).

Some of the proposals outlined in the BMEP (Appendix 6-4) will disturb local peat, soil and subsoil deposits and increase the likelihood of erosion of peat and subsoils. However, due to the largely non-invasive nature of the works the potential for effects on the soils and geological environment are limited.

Operational Phase

The BMEP works will have a positive, slight, direct, permanent likely effect on the land environment. Please see Ch. 6 Biodiversity and Appendix 6-4 Biodiversity Management and Enhancement Plan (BMEP) for details.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase to a lesser extent and lesser duration, with the exception of the implementation of the BMEP works which are intended to be permanent.

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Biodiversity and Water

Construction Phase

Site activities during the construction phase of the Proposed Project may have the potential to give rise to water pollution, and consequential indirect effects (such as local peat, soil and subsoil deposits and increase the likelihood of erosion of peat and subsoils and have the potential for the entrainment of suspended solids in runoff) on flora and fauna that use that water within the same catchment. However, due to the largely non-invasive nature of the works the potential for effects are limited. These potential impacts have been assessed in Ch 6 Biodiversity and Ch 9 Water and the relevant mitigation measures outlined in these chapters and the CEMP (Appendix 4-5) will be in place to avoid any water pollution and subsequent effect on flora and fauna.

BMEP (Appendix 6-4) works are proposed to offset the loss of habitats within the Site and to further enhance the biodiversity of the Site.

As part of the Proposed Project, enhancement measures (2.5km of hedgerow/treeline planting on site, 3.5ha of native broadleaved woodland planting on site, enhancement of 1.16ha of Molinia meadow) have the potential to impact downstream surface water quality. These works will begin in the pre-construction stage and will have negative, temporary, direct, imperceptible, unlikely effect on surface water quality, aquatic fauna and aquatic habitats.

Operational Phase

The potential for increased surface water runoff is the primary potential impact during the operational phase of the Proposed Project. This is considered to have possible negative effect on biodiversity.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Biodiversity and Air Quality

Construction Phase

During the construction phase of the Proposed Project, increased vehicular and dust emissions within and around the Site have the potential to be a nuisance to flora and fauna, thereby having a short-term, slight, negative effect. The mitigation measures outlined in Ch 10 Air Quality and the CEMP (Appendix 4-5) of the EIAR will ensure that the potential for negative effects is reduced or eliminated.

Operational Phase

During the operational phase, the potential for effects on biodiversity from vehicular and dust emissions are imperceptible, however the overall displacement of fossil fuel emissions resulting from the operation of the Proposed Project will have a long-term moderate positive effect on air quality for biodiversity.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Biodiversity and Climate

Construction Phase

The construction of the Proposed Project will result in greenhouse gas emissions associated with construction of Proposed Project infrastructure and construction materials, and operation of vehicles and plant. As well, the Proposed Project footprint will result in the loss of carbon fixing vegetation within the Site. The impact on biodiversity will be negative and slight only given the quantity of greenhouse gases that will be emitted to the atmosphere and will be restricted to the duration of the construction phase. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from construction phase activities will have a permanent imperceptible, negative effect on the climate and therefore biodiversity. This is assessed further in Chapter 11 (Climate) of this EIAR, and mitigation measures are presented to minimise any potential effects.

Operational Phase

During the operational phase, the potential for effects on biodiversity from vehicular and dust emissions are long-term, imperceptible, and negative, however the overall displacement of fossil fuel emissions resulting from the operation of the Proposed Project will have a long-term moderate positive effect on air quality for biodiversity.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Biodiversity and Noise & Vibration

Construction Phase

Site activity during the construction phase could give rise to noise that could be a nuisance for fauna, which use the Site. Best practice mitigation measures are included in Ch 6 Biodiversity ,Ch 12 Noise & Vibration and the CEMP (Appendix 4-5) to minimise the potential negative effect of noise generated during the construction phase on biodiversity. Taking into account the mitigation measures the effect of noise on biodiversity is considered to be negative, slight and short term.

Operational Phase

The predicted noise levels associated with the proposed turbines are within best practice noise criteria therefore it is not considered that a significant effect is associated with turbine noise from the Proposed Wind Farm. The limited onsite noise activity generated by the Proposed Project during the operational phase will have a negative, imperceptible and permanent effect on biodiversity.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

17.2.3 Birds

Birds and Land, Soils & Geology

Construction Phase

The removal of hedgerows and disturbance to soil during construction phase of the Proposed Project is likely to result in some disturbance of flora and fauna, including birds, in the areas surrounding the Proposed Project works area. During the construction phase, there will be a short-term, slight, negative effect on birds. The relevant mitigation measures outlined in Ch. 7 Birds, Ch. 8 Lands, Soils & Geology and the CEMP (Appendix 4-5) will be in place to avoid any potential significant effect on birds.

Operational Phase

A wind farm and associated grid infrastructure is not a recognised source of pollution and so the potential for effects during the operational phase are imperceptible. With the implementation of mitigation and monitoring measures detailed in Section 8.6.3 of Ch. 8 Lands, Soils & Geology and the CEMP (Appendix 4-5), the potential for residual effects associated with soil or ground contamination during the operational phases and subsequent health effects are negative, imperceptible, indirect, long-term, and unlikely.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Birds and Water

Construction Phase

Site activities during the construction phase of the Proposed Project may have the potential to give rise to some water pollution, and consequential short term negative effects on birds and their prey species (such as disturbance and deterioration of habitat quality) that use that water within the same catchment. With the implementation of mitigation and monitoring measures outlined in Ch. 7 Birds, Ch. 9 Water and the CEMP (Appendix 4-5), there will be a short-term, slight, negative effect during the construction phase.

Operational Phase

The potential for increased surface water runoff is the primary potential impact during the operational phase of the Proposed Wind Farm. This is considered to have a possible negative effect on birds.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Birds and Air Quality

Construction Phase

During the construction phase of the Proposed Project, increased vehicular and dust emissions within and around the Site have the potential to be a nuisance to birds, thereby having a short-term, slight, negative effect. The mitigation measures outlined in Ch. 10 Air Quality and the CEMP (Appendix 4-5) of the EIAR will ensure that the potential for negative effects is reduced or eliminated.

Operational Phase

During the operational phase, the potential for effects on birds from vehicular and dust emissions are imperceptible, however the overall displacement of fossil fuel emissions resulting from the operation of the Proposed Project will have a long-term moderate positive effect on air quality for birds.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Birds and Climate

Construction Phase

The construction of the Proposed Project will result in greenhouse gas emissions associated with tree felling, production of Proposed Project infrastructure and construction materials, and operation of vehicles and plant. As well, the Proposed Project footprint will result in the loss of carbon fixing vegetation within the Site. This impact on Birds ranges from a negative slight to imperceptible, short term, indirect effect, given the quantity of greenhouse gases that will be emitted to the atmosphere and will be restricted to the duration of the construction phase. Once emitted to the atmosphere, the greenhouse gas emissions that will arise from construction phase activities will have a permanent imperceptible negative effect on Climate.

Operational Phase

During operational phase, the Proposed Project will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 35-year operational lifespan due to the provision of clean

renewable energy to the national grid, consequently, in combination with other renewable energy projects, the Proposed Project will have a long term, moderate positive effect on birds.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Birds and Noise & Vibration

Construction Phase

Site activity during the construction phase could give rise to noise and vibration that could be a nuisance for birds, which use the Site. Best practice mitigation measures are included in Ch 7 Birds and Ch12 Noise & Vibration and the CEMP (Appendix 4-5) to minimise the potential negative effect of noise generated during the construction phase. Accounting for the mitigation measures mentioned above, the residual effect of noise and vibration during construction on birds is considered to be negative, short term, and not significant.

Operational Phase

The limited onsite noise activity generated by the Proposed Project during the operational phase could be a nuisance for birds. Operational noise could have a negative, imperceptible and long term effect on Birds.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

17.2.4 Land, Soils and Geology

Land, Soils & Geology, and Water

Construction Phase

As identified in Ch 9 Water, 0.7ha of conifer forestry will be felled to accommodate the Proposed Project. The Proposed Project also includes the permanent loss of 1,256m of linear vegetation and permanent loss of 2.5396ha of scrub. A Biodiversity Management and Enhancement Plan (BMEP) has been prepared for the Proposed Project and is included as Appendix 6-4. Proven forestry best practice measures to mitigate the risk of releases of sediment have been proposed to ensure that the deforestation activities have no potential impact on the status, ecology or hydro morphology of downstream waters. The residual effect of the Proposed Project will be negative, imperceptible, indirect, temporary, likely effect on downstream water quality and aquatic habitats.

Operational Phase

As identified in Ch 8 Lands, Soils & Geology of this EIAR, the erosion of soil/subsoil can have the effect of reducing the overall volume of soil/subsoil at the Site, with the potential for some eroded subsoils to reach watercourses, leading to water quality issues such as high turbidity. This has the potential to have a slight short term negative effect on water quality. Mitigation measures to ensure there are no negative effects on water quality are presented in Ch 8 Lands, Soils & Geology, Ch 9 Water, and the CEMP (Appendix 4-5).

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Land, Soils & Geology and Air Quality

Construction Phase

The excavation works and transportation of vehicles to/from and around the Site will give rise to dust, which is considered a short-term, slight, negative impact on air quality. Mitigation measures outlined in Chapter 10 Air Quality will reduce the potential for negative effects on land, soils, and geology, including includes dust suppression measures which is further outlined in the CEMP (Appendix 4-5).

Operational Phase

No anticipated interactive effect.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Land, Soils & Geology and Climate

Construction Phase

Bogs and peatlands are known to store large amounts of carbon. Due to the waterlogged nature of these habitats, stored carbon is not broken down and released into the atmosphere. The construction of wind farms on bog and peat habitats may affect the natural hydrological regime, thus exposing and drying out the peat and allowing the decomposition of carbon. With the implementation of mitigation measures set out in Chapter 8 Land Soils and Geology, section 8.6.2. the Proposed Project will incur a negative, imperceptible, direct, short-term effect on the climate.

Operation Phase

No interactive impact anticipated

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

Land, Soils & Geology and Cultural Heritage

Construction Phase

The construction of the Proposed Project will not result in any direct, negative effects on the recorded archaeological, architectural or cultural heritage resource as none of these sites are located within the footprint of the development that require excavations and ground works. However, the removal of peat and spoil during the construction phase is likely to have a permanent, slight, negative effect on any previously unrecorded sub-surface archaeological site and/or artefacts after mitigation is applied. Mitigation measures outlined in Chapter 14 Archaeological, Architectural and Cultural Heritage will reduce the potential for negative effects on unrecorded sites and artefacts during excavations.

Operation Phase

During the operational phase, there is no potential for impacts on cultural heritage from a land soils and geology perspective as there will be no groundworks excavations associated with this phase.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

17.2.5 Air Quality

Air Quality and Material Assets

Construction Phase

The transportation of vehicles to/from and around the Proposed Project during the construction phase will give rise to dust emissions which is considered a short-term, slight, negative impact on air quality. Following implementation of mitigation measures as outlined in Chapter 10 Air Quality, Chapter 15 Material Assets and the CEMP (Appendix 4-5) there will be a short-term, imperceptible, negative effect on air quality due to transportation movements.

Operation Phase

The effects on air quality due to dust emission will be negligible during the operation phase given that there will only be an average of approximately 1 to 2 trips made to the Proposed Wind Farm by car or light goods vehicle per day, with no regular visits required for the Proposed Grid Connection. The effects of the maintenance traffic on air quality will therefore be imperceptible, negative and long term.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

17.2.6 Climate

Climate and Material Assets

Construction Phase

The construction of the Proposed Project will result in greenhouse gas emissions associated with construction of Proposed Project infrastructure and construction materials, and operation of vehicles and plant. The Proposed Project footprint will result in the loss of carbon fixing vegetation within the Site. This effect will be negative, imperceptible, and permanent given the quantity of greenhouse gases that will be emitted to the atmosphere and will be restricted to the duration of the construction phase. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from construction phase activities will have a permanent imperceptible negative effect on Climate and therefore material assets. This is assessed further in Ch. 11 Climate of this EIAR, and mitigation measures are presented to minimise any potential effects.

Operation Phase

During the operational phase, the Proposed Project will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 35-year lifespan of the Proposed Project. Therefore, while there will be greenhouse gas emissions associated with the operation of the Proposed Project, this will be offset by the operation of the Proposed Project which will offset 19,731 tonnes of carbon dioxide per annum or 690,731 tonnes over its operational life from traditional carbon-based electricity generation. Subsequently, this will cause a long-term moderate positive effect on Climate as a result of reduced greenhouse gas emissions.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

17.2.7 Landscape and Visual

Landscape & Visual and Cultural Heritage

Construction Phase

The construction activities may potentially cause temporary impacts on the landscape setting of recorded sites and monuments in the wider area through the creation of temporary structures, dust, soil erosion and alterations to drainage. Mayo Abbey Cemetery and Church Ruins is a cultural heritage receptor of high sensitivity and is located approx. 2km northwest from the nearest proposed turbine (T7). It is considered that the changes in landscape construction phase will have a negative, not significant, imperceptible effect in terms of direct landscape effects.

Operation Phase

As described in Ch. 13 Landscape & Visual of this EIAR, the proposed turbines have the potential to change the landscape setting of recorded sites and monuments in the wider area. However, it is concluded in Ch. 13 Landscape and Visual that any potential, indirect, negative visual effect of the proposed turbines on sites and monuments range from imperceptible to moderate. In reality the effect will be less severe due to natural screening, boundaries, buildings and vegetation, which will alleviate if not remove the impact on setting altogether. Furthermore, some monuments may not be readily visible in the landscape which further ameliorates potential effects on setting. Additionally, many of these monuments are located on private land which are not formally accessible to the public.

Decommissioning Phase

Any interactive impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

17.2.8 Vulnerability to Natural Disasters

Construction, Operation and Decommissioning Phase

As described in Ch. 16 Major Accidents and Natural Disasters, major accidents or natural disasters are hazards which have the potential to affect the Proposed Project and lead to environmental effects both directly and indirectly. These include accidents during construction, operation and decommissioning of the Proposed Project caused by operational failure and/or natural hazards. The assessment of the potential for significant accidents or disasters is conducted in connection with the information that must be included in the EIAR. This includes aspects such as population and human health, biodiversity, birds, land and soil, water, air quality, climate, cultural heritage, the landscape and material assets. The risk of a major accident and/or disaster during the construction of the Proposed Project is considered 'low' in accordance with the *'A Framework for Major Emergency Management – A Guide to Regional Risk Assessment*[1] (2024, DoHLGH)

When the above mitigation is implemented, and all mitigation detailed in the EIAR is implemented, the residual effect(s) associated with the construction, operation and decommissioning of the Proposed Project are Not Significant.

On this basis, the identified interaction during the construction, operation and decommissioning phase is Not Significant.

17.3 Mitigation and Residual Effects

Where any potential interactive negative effects have been identified in the above, a full suite of appropriate mitigation measures has already been included in the relevant sections (Chapters 5 – 16) of the EIAR and are detailed in the CEMP (Appendix 4-5). The implementation of these mitigation measures will reduce and / or eliminate the potential for there to be effects. Information on potential residual effects and the significance of effects, is also presented in each relevant chapter. On this basis the effects arising from the identified interactions are Not Significant.

[1] *DoHLGH (2024) A Framework for Major Emergency Management – A Guide to Regional Risk Assessment. Available at: https://assets.gov.ie/static/documents/Guide_to_Regional_Risk_Assessment_September_2024.pdf*