Planning and Environmental Consultants

Killoshulan Wind Farm

Environmental Impact Assessment Report (EIAR)

Chapter 17 - Interaction of Effects



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Table of Contents

17. INTERACTION OF EFFECTS 17-1

17.1 Introduction 17-1
17.1.1 Statement of Authority 17-3
17.2 Impact Interactions 17-4
17.2.1 Population and Human Health 17-4
17.2.2 Biodiversity 17-10
17.2.3 Ornithology 17-14
17.2.4 Land, Soils and Geology 17-18
17.2.5 Air Quality 17-21
17.2.6 Climate 17-21
17.2.7 Landscape and Visual 17-22
17.2.8 Vulnerability to Natural Disasters 17-23
17.3 Mitigation and Residual Effects 17-24

Table of Tables

Table 17-1 Interaction Matrix: Potential for Interacting Impacts 17-2

17. INTERACTION OF EFFECTS

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 & Human Health, Biodiversity, Ornithology, Land, Soils & Geology, Hydrology & Hydrogeology, Air Quality, Climate, Noise & Vibration, Landscape & Visual, Cultural, Material Assets (Roads and Traffic, Telecommunications, Aviation, Utilities and Waste Management) and Major Accidents & Natural Disasters as a result of the Proposed Project, as described in Chapter 4 of this EIAR. All of the potential significant effects of the Proposed Project and the measures proposed to mitigate them have been outlined in the preceding chapters of this EIAR. Mitigation measures and best practice measures for the construction, operation and decommissioning of the Proposed Project are detailed in the accompanying Construction and Environmental Management Plan (CEMP), included as Appendix 4-3 of this EIAR. However, for any development with the potential for significant environmental effects there is also the potential for interaction between these potential significant effects. The result of interactive effects may exacerbate the magnitude of the effects or ameliorate them or have a neutral effect.

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. The matrix is symmetric, with each environmental component addressed in the chapters of this EIAR being placed on both axes of a matrix, and therefore, each potential interaction is identified twice. 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 Hydrology & Hydrogeology, the interaction will not be discussed again in the following relevant section, therefore there is no Hydrology & Hydrogeology and Population & Human Health section.

Table 17-1 Interaction Matrix: Potential for Interacting Impacts

	Phase	Population and Human Health	Biodiversity	Ornithology	Land, Soils and Geology	Hydrology & Hydrogeology	Air Quality	Climate	Noise and Vibration	Cultural Heritage	Landscape and Visual	Material Assets	Major Accidents & Vulnerability to Natural Disasters
Population and Human Health	C												
	O												
Biodiversity	C												
	O												
Ornithology	C												
	O												
Land, Soils and Geology	C												
	O												
Hydrology and Hydrogeology	C												
	O												
Air Quality	C												
	O												
Climate	C												
	O												
Noise and Vibration	C												
	O												
Cultural Heritage	C												
	O												
Landscape and Visual	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 prepared by Evan Connolly and reviewed by Jonny Fearon.

Evan is an Environmental Scientist with MKO within the Environmental Renewables team with over 2 years of experience of private consultancy experience. Evan holds a B.Sc. (Hons) in Earth and Ocean Science from the University of Galway and an interinstitutional M.Sc. in Sustainable Resource Management: Policy & Practice from University of Galway and University of Limerick. Since joining MKO Evan has been involved as an Environmental Scientist on a range of wind energy infrastructure projects. Within these projects Evan has been responsible for the drafting and reviewing of EIAR chapters, constraints analysis, data analysis and GIS mapping. Outside of large scale EIAR projects Evan has also led wind farm feasibility studies and scoping exercises.

Jonny Fearon is a Project Environmental Scientist with MKO having joined the company in March 2022. Jonny holds a BSc (Hons) Environmental Science, a MSc (Hons) in Environmental Leadership and a Specialist Diploma in Corporate Environmental Planning. Since joining MKO, Jonny has been involved in a range of wind farm projects. In his role as a Project Environmental Scientist, Jonny 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.

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 forestry related activities within the Site. Due to the small permanent built infrastructure footprint of the Proposed Wind Farm (and Proposed 110kV Substation(c. 16.6 ha)) consisting of approximately 2.9% of the Proposed Wind Farm site, the residual effect is considered to be a short-term, slight, direct, and negative effect on land use and activities during the construction phase.

The greatest potential for effects on land, soils, and geology to have impacts on population and human health will occur during the approximately 18-24 month construction phase. Construction activities will involve land occupation, site clearance, earthworks, excavation, and the handling, storage, and reuse of topsoil, subsoil, bedrock, and other excavated materials. This has the potential to cause significant contamination of land, soils, subsoil or bedrock arising from accidental spills, leaks or other releases which can cause adverse effects to human health. The Karst Assessment Report (Appendix 8-3) identified areas of higher karst risk within the southern portion of the Proposed Wind Farm site, particularly at turbine locations T01, T02 and T03. Such events could potentially pose a risk to the health and safety of construction and operational personnel due to karst related ground instability hazards such as subsidence or collapse of doline.

Following mitigation measures outlined in the *Karst Assessment Report (Appendix 8-3)* and *Chapter 8* the residual interactive effect between human health and land soils and geology is therefore assessed as being negative, slight, direct, permanent, and unlikely.

Operation Phase

With the implementation of mitigation and monitoring measures detailed in Section 8.5.3 of Chapter 8: and the CEMP (Appendix 4-3), the potential for residual interactive effects associated with soil or ground contamination and subsequent health effects during the operational phases are long-term, imperceptible, indirect, negative, and unlikely.

Decommissioning Phase

During the decommissioning phase, potential interactions between Land, Soils & Geology and Population and Human Health will principally arise from localised ground disturbance, excavation, plant movement, temporary storage of dismantled components and excavated materials, and the potential for accidental spills or leaks of fuels, oils or hydraulic fluids. Decommissioning works will include the removal of above-ground turbine and mast components and the removal of the 33kV electrical cabling. Proposed Turbine and mast foundations and cable ducting will remain in situ, thereby avoiding more extensive excavation and associated disturbance.

The mitigation measures identified for the construction phase in Section 8.5.2 of Chapter 8: will also be implemented during decommissioning, where relevant. Following implementation of these measures, the residual interactive effect between Land, Soils and Geology and Population and Human Health is considered to be temporary, imperceptible, direct, negative and unlikely.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is not considered significant.

Population and Human Health and Hydrology and Hydrogeology

Construction Phase

The greatest potential for effects on hydrology and hydrogeology to have impacts on population and human health will occur during the approximately 18-24 months construction phase, as described in Chapter 4.

Potential health effects arise mainly through the potential for surface and groundwater contamination which can have negative effects on public and private water supplies. A portion of the Proposed Project site is located inside the Clomantagh/Killoshulan Group Water Scheme SPA, but investigations have been carried out to assess the risk (see Chapter 9, Section 9.5.2.1) posed by the Proposed Project. Notwithstanding this, the Proposed Project design and mitigation measures ensures that the potential for effects on the water environment will not be significant.

Flooding of property can cause inundation with contaminated flood water. Flood waters can carry waterborne disease and contamination/effluent. Exposure to such flood waters can cause temporary health issues.

A site-specific Flood Risk Assessment (Appendix 9-1) has been carried out for the Proposed Project, summarised in Section 9.3.6. The lack of Proposed Project infrastructure encroachment into flood zones, combined with the assessment of changes in permeable surfaces (Section 9.5.3.1) demonstrates that the risk of the Proposed Project contributing to downstream flooding is imperceptible. On-site (construction and operation phase) drainage control measures will ensure no downstream increase in local flood risk.

The residual interactive effect between human health and hydrology and hydrogeology is therefore assessed as being temporary, imperceptible, indirect, negative and unlikely.

Operation Phase

During the operational phase, all permanent drainage controls will be in place and the disturbance of ground and excavation works will be complete. Only minor maintenance works may be completed and would be very infrequent. It is not envisaged that any significant refuelling works will be undertaken on site during the operational phase.

The interactive effect will be a temporary, imperceptible, indirect, and negative and unlikely effect on population and human health due to water 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.

The residual interactive effect between population and human health and hydrology and hydrogeology during the Decommissioning Phase is therefore assessed as being temporary, imperceptible, indirect, negative and unlikely.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is considered to be not significant.

Population and Human Health, and Air Quality

Construction Phase

The greatest potential for effects on Air Quality to have impacts on population and human health will occur during the approximately 18-24 months construction phase, as described in Chapter 4. The excavation and movement of spoil during the construction of the Proposed Wind Farm and Proposed Grid Connection, as well as the transport of construction materials and staff, will also give rise to some localised dust emissions, especially during periods of dry weather.

Potential dust and exhaust emission sources during the construction phase of the Proposed Wind Farm include upgrading of existing access tracks and construction of new access roads, turbine and meteorological mast foundations, temporary construction compounds.

An increase in dust and exhaust emissions has the potential to cause a nuisance to sensitive receptors in the immediate vicinity of the Proposed Wind Farm site. The transport of construction materials and staff to and from the Site also has the potential to create dust and increase exhaust emissions, which could affect nearby sensitive receptors. These effects will have a short-term, slight, negative impact on air quality.

Following mitigation measures outlined in Chapter 10 the residual interactive effect between population and human health and Air Quality during the construction phase is therefore assessed as being short-term slight and negative.

Operational Phase

During the operational phase, the Proposed Project will generate additional traffic to the area in the form of light goods vehicles (LGVs) visiting the Site up to 3 times per day for inspections and maintenance, giving rise to a Long-term, Imperceptible Negative, Indirect impact on air quality. However, wind turbines are not a recognised source of pollution and will instead be providing clean energy into the National Grid.

By providing an alternative to electricity derived from coal, oil or gas-fired power stations during the operational phase, the Proposed Project will result in emission savings of carbon dioxide (CO_2), oxides of nitrogen (NO_x), and sulphur dioxide (SO_2).

The overall residual interactive effect of producting renewable energy from the Proposed Project will have a long-term, moderate, positive, interation 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 phases of the Proposed Project is not significant.

Population and Human Health, and Climate

Construction Phase

The construction of the Proposed Project will result in the emission greenhouse gas emissions to the atmosphere that will arise from construction activities will have an overall permanent imperceptible negative interactive effect on Climate and therefore population and human health.

The residual interaction will be short-term, imperceptible, negative.

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.

The Proposed Project would displace approximately 28,277 tonnes of carbon dioxide per annum or 989,687 tonnes over its operational life from traditional carbon-based electricity generation. The operational phase of the Proposed Project will offset the 111,902 tonnes of carbon dioxide associated with the construction and operational phases that will be lost to the atmosphere in approximately 47.2 months of operation. The overall residual interaction will have a long-term moderate positive effect on climate and therefore a long-term moderate positive effect on health.

On this basis, there identified interaction is not significant.

Decommissioning Phase

The decommissioning of the Proposed Project will result in the emission of the greenhouse gas emissions that arising from decommissioning phase activities. As the extent of excavation and construction activity required during decommissioning will be substantially less than during the construction phase and of a shorter duration, the associated greenhouse gas emissions will also be lower. The mitigation measures prescribed for the construction phase of Chapter 11 will be implemented during decommissioning, where relevant, to minimise greenhouse gas emissions from plant, vehicles and material handling.In the context of Population and Human Health, the scale of greenhouse gas emissions associated with decommissioning is not considered sufficient to result in a significant adverse effect on human health.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is not significant.

Population and Human Health and Noise and Vibration

Construction Phase

As identified in Chapter 5 of this EIAR, the construction phase will generate an increase in noise levels in the vicinity of the Site which has the potential to cause a nuisance to sensitive receptors in the area. The contractor undertaking the construction of the works will be obliged to take specific noise abatement measures and comply with the recommendations of British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise* and all mitigation measures, as detail in Chapter 12 and the CEMP, will be implemented.

The construction phase will likely create a short-term, not significant, negative residual interaction effect between noise and vibration and human health due to the nuisance caused by construction plant and vehicle noise emissions.

Operational Phase

As detailed in Chapter 12 the predicted noise emissions during the operational phase, once the appropriate mitigation measures are implemented, will be long-term negative and not significant. Furthermore, as noise emissions from turbines are controllable via inbuilt technologies, the Proposed Project will be able to comply with the *'Wind Energy Development Guidelines for Planning Authorities'* (Department of the Environment, Heritage and Local Government (DoEHLG), 2006)

(hereafter referred to as the Guidelines (DoEHLG, 2006)) and future iterations should they come into effect before a decision is made on this application. Likewise, the proposed turbines will be capable of achieving compliance with noise conditions imposed should the Proposed Project receive a grant of planning permission.

The operational phase will likely create a long-term, not significant, negative residual interaction effect between noise and vibration and human health due to the predicted noise emissions caused by turbines.

Decommissioning Phase

Activities related to decommissioning of the Proposed Wind Farm will use similar plant to that used for construction activities (including decommissioning of the existing turbines) and will occur at the same locations, as such noise level output during the decommissioning phase is expected to be no higher than the construction phase.

Chapter 12 therefore assesses the residual noise and vibration effect during decommissioning as short-term, not significant and negative. Consequently, while decommissioning activities may result in a temporary increase in noise experienced by nearby residents, the associated interaction between noise and vibration and population and human health will not result in a significant effect.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project 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.

Following implementation of the mitigation measures and having regard to the existing mitigating factors within the receiving environment residual visual effects during the construction phase temporary to short-term, negative effects, within the following range: not significant – slight, these effects are considered not significant.

Operational Phase

As detailed in Chapter 13 the landscape character of the Proposed Wind Farm site will undergo substantial change through the introduction of the Proposed Turbines as tall, vertical man-made structures, together with turbine hardstands, access roads and other ancillary infrastructure. As outlined in Section 13.7.3.1 of Chapter 13, these changes will result in Long-term landscape effects of 'Moderate' significance upon the physical fabric of the Proposed Wind Farm site. These direct landscape effects will be highly localised to the footprint of the Proposed Project within the Proposed Wind Farm site. Effects on the perceptual and aesthetic character of the Proposed Wind Farm site are also assessed as long-term, moderate, direct and negative, which is not significant in the context of EIA.

Within the LVIA Study Area, the visual impact on residential receptors long-term, negative effects, within the following range: imperceptible – moderate (for a small number of residences in very close proximity).

Given that the reccomeded setback distances (within the Guidelines and Draft 2019 Guidelines) between residential receptors and the Proposed Turbines have been provided for to protect visual amenity, on balance, effects on residential receptors are mitigated and are therefore not significant.

Decommissioning Phase

Turbine foundations and hardstand areas will remain in place underground and would be covered with earth and reseeded as appropriate. This naturalisation process would return the landscape of the Proposed Wind Farm site to a condition broadly similar to the current landscape baseline. The Proposed Turbines and ancillary infrastructure would be removed during decommissioning, with the exception of the Proposed 110kV Substation and associated grid infrastructure, which would remain in place as Permanent elements of the national electricity grid.

The removal of the Proposed Turbines and ancillary infrastructure during decommissioning is predicted to result in direct, short-term and negative visual effects of Slight significance, which are not significant in the context of EIA.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project 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 some short-term inconvenience for other road users as well as dust and exhaust emissions. A Traffic Management Plan is included as Appendix 15-3 and will be updated and agreed with the county council prior to construction to minimise all disruption, as described in Chapter 15. As detailed in Chapter 15 the Proposed Project will have a no impacts on telecommunications and aviation assets or operations and a short-term, slight, negative effect on utilities during the construction phase.

It is considered that the construction phase will have a short -term, slight negative residual interactive effect between Material Assets and Population and Human Health as a result of traffic movements, dust and exhaust emissions.

Operational Phase

As the traffic impact of the Proposed Project will be imperceptible during the operational stage. There will be up to 3 no. large goods vehicle trips to the Proposed Wind Farm site per day, there will be no residual effects during this stage. There will be no operational phase impacts on telecommunications, aviation or utility assets associated with the operational phase of the Proposed Project.

Based on the assessment above there will be no interaction or significant effects.

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, the effect on traffic, the local road network, telecommunications, aviation and utility assets will be to a lesser extent and lesser duration.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is not significant.

17.2.2 Biodiversity

Biodiversity, and Ornithology

Construction Phase

Site activities during the construction phase of the Proposed Project have the potential to interact with ornithological receptors through the loss, fragmentation and disturbance of habitats that provide nesting, roosting and foraging opportunities for birds and support their prey species. Potential impacts on Key Ornithological Receptors (KORs), including direct habitat loss and disturbance/displacement, are assessed in Section 7.4.2 of Chapter 7.

Following implementation of mitigation presented in Chapter 6 and 7 of the EIAR, no potential for residual interactive effect exists at any geographic scale between biodiversity and ornithology during the construction phase. The planting of additional linear habitats as outlined will result in a net gain of linear habitats within the Proposed Project site, however the likely benefits of such on biodiversity including birds will not be of much merit until the operational phase of the Proposed Project.

Therefore the residual interactive effect between biodiversity and ornithology during the construction phase is considered to be long term, slight, direct, negative and likely.

Operational Phase

During the operational phase, there will be no additional land take or habitat loss associated with the operation of the Proposed Project. The Biodiversity Enhancement and Management Plan (BEMP), included as Appendix 6-4, provides for habitat creation and enhancement measures including new hedgerow planting (c. 225m), hedgerow bolstering (c. 3.4km) and grassland enhancement (c 11.6ha). These measures will strengthen habitat connectivity within the Site and increase the availability and quality of habitats capable of supporting birds and their prey species as the planting becomes established.

The establishment and long-term management of these habitats will therefore result in a Positive interaction between Biodiversity and Ornithology through improved ecological connectivity and increased nesting, sheltering and foraging opportunities. The residual interaction effect between Biodiversity and Ornithology during the operational phase is therefore considered to be long term, slight, direct, neutral and likely in the context of EIA.

Decommissioning Phase

No further habitat loss will occur during the ecommissioning Phase, however there will be a temporary disturbance of habitats and species associated with plant, vehicle movements, noise and human activity. However, these effects will occur over a more limited extent and duration. Habitat enhancement measures established under the BEMP will remain in place and will continue to provide ecological and ornithological benefits.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is not significant.

Biodiversity and Land, Soils & Geology

Construction Phase

The removal of conifer forestry and hedgerow and the excavation of 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 long term, slight, negative effect on flora and fauna. These potential impacts have been assessed in Chapter 6 of this EIAR, and excavated spoil will be contained on site in the designated spoil management areas or used for landscaping.

Prior to construction commencement it is proposed that sections of grassland are managed and enhanced,existing hedgerows are bolstered, and new native hedgerows are planted within the Proposed Wind Farm site to promote greater floral diversity.This measure will create additional habitat for commuting and foraging fauna, including bats, badger and other protected fauna, within the Proposed Wind Farm site. The proposed bolstering and planting of Hedgerow (WL1) habitat will mitigate the permanent loss of approximately 1.34km of linear features within the Proposed Wind Farm site by improving the foraging, commuting and breeding corridor network for protected fauna utilizing the Site.

Taking account of the proposed mitigation outlined in Chapter 6, Chapter 8, CEMP (Appendix 4-3) and BEMP (Appending 6-4) the residual interactive effect between Biodiversity and Land, Soils and Geology during the construction phase is deemed to be long-term, slight, negative, direct and likely.

Operational Phase

Once established, the biodervisty enhancement measures offset the loss of habitats identified within the Proposed Wind Farm

This interation will have long term, moderate, direct, positive likely effect on the land environment.

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 proposed biodervisty enhancement measures which are intended to be Permanent.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is not significant.

Biodiversity and Hydrology & Hydrogeology

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 disturbance and deterioration of habitat quality) on aquatic habitats and species within the same catchment. These potential impacts have been assessed in Chapter 6 and Chapter 9 and the relevant mitigation measures outlined in these chapters and the SWMP (Appendix 4-5) will be in place to avoid any water pollution and subsequent effect on flora and fauna.

As outlined in Chapter 9 construction activities including tree felling, vegetation removal, earthworks, excavation, watercourse crossings, dewatering and the movement and storage of construction materials have the potential, in the absence of mitigation, to result in the mobilisation of sediment, suspended solids, organic matter and other pollutants to the Site drainage network and downstream watercourses.

Such effects could result in a deterioration in water quality and consequently affect aquatic habitats and species.

A comprehensive drainage management system will be implemented during the construction phase to prevent potentially contaminated runoff from reaching watercourses. Measures include the interception and diversion of clean water around works areas, collection and treatment of potentially sediment-laden runoff, settlement ponds, check dams, silt controls, buffered diffuse discharges and the avoidance of direct discharges to watercourses. Works will also be restricted during significant rainfall events and water quality monitoring, including turbidity monitoring, will be undertaken during construction.

As part of the Proposed Project, proposed works required to implement the proposed biodiversity enhancement measures have the potential to impact downstream surface water quality. Once established, the proposed planting will provide a Positive interaction between biodiversity and the water environment by improving riparian habitat, increasing habitat connectivity and assisting in the protection of downstream water quality.

Taking account of the proposed mitigation and monitoring measures the residual interactive effect between Biodiversity and Hydrology and Hydrogeology will have a short term, imperceptible, indirect, negative residual interactive effect during the construction phase.

Operational Phase

During the operational phase, the replacement of natural ground surfaces with turbine hardstands, access roads and other permanent infrastructure will result in a localised increase in surface water runoff. There is therefore potential for an interaction with biodiversity where changes to runoff volumes, drainage or water quality could affect downstream aquatic habitats and species.

The operational drainage system will continue to collect, attenuate and discharge runoff in a controlled manner through the drainage measures established during construction. Routine inspection and maintenance of drains, check dams and settlement ponds will also be undertaken to ensure that the drainage system continues to operate effectively. Chapter 9 concludes that, following implementation of these measures, effects associated with increased runoff and water quality during operation will be Imperceptible or not significant and therefore will not have a significant interactive effect on biodiversity.

Taking account of the of the proposed mitigation and monitoring measures the residual interactive effect between Biodiversity and Hydrology and Hydrogeology will be long term, imperceptible, indirect, positive during the operational phase.

Decommissioning Phase

Potential interactive effects during the decommissioning phase will generally be similar to those identified during the construction phase, including the potential mobilisation of sediment and accidental release of pollutants during the removal of infrastructure and movement of plant and machinery. However, the scale and duration of decommissioning works will be less than during construction.The mitigation and water management measures described for the construction phase will also be implemented, where relevant, during decommissioning.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project 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, Indirect effect. The mitigation measures outlined in Chapter 10 and the CEMP (Appendix 4-3) of the EIAR will ensure that the potential for negative effects is reduced or eliminated. Therefore the residual interactive effect between Air Quality and Biodiversity is short term, slight, negative and indirect.

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 indirect effect on air quality, which will positively impact 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 given the reduced amount of excavation works required and due to the fact that all foundations and access roads will remain in-situ.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is not significant.

Biodiversity 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 built infrastructure 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 of this EIAR, and mitigation measures are presented to minimise any potential effects.

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, direct, positive, residual interactive effect on flora and fauna.

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 phases of the Proposed Project is not significant.

Biodiversity and Noise & Vibration

Construction Phase

Site activity during the construction phase could give rise to noise that could be a cause disturbance to fauna, which use the Site. Best practice mitigation measures are included in Chapter 6 and to minimise the potential negative effect of noise generated during the construction phase on biodiversity. Taking into account the mitigation measures the residual interactive effect of noise and biodiversity is considered to be short term, slight, indirect and negative.

Operational Phase

The Proposed Project will introduce a new operational noise source into the existing environment; however, operational activity within the Site will otherwise be limited, with maintenance visits and associated vehicle movements occurring intermittently. The predicted noise levels associated with the Proposed Turbines are not considered to have potential to cause a significant effect on biodiversity within the Proposed Wind Farm site. The limited onsite noise activity generated by the Proposed Project during the operational phase will have a long-term, imperceptible, indirect and neutral effect on biodiversity.

Decommissioning Phase

Site activity during the decommissioning phase could give rise to noise that could be a nuisance for fauna, which use the Site. Noise levels associated with decommissioning will be similar to the construction phase noise, however to a much lesser extent and lesser duration, given the lack of excavation works require throughout the Site.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is not significant.

17.2.3 Ornithology

Orithology and Land, Soils & Geology

Construction Phase

Construction of the Proposed Project will require permanent and temporary land-take together with site clearance, earthworks and the excavation and handling of topsoil, subsoil and locally occurring bedrock. These activities have the potential to interact with ornithological receptors through the loss, alteration and disturbance of habitats used by birds for breeding, foraging and roosting. Direct habitat loss and disturbance/displacement, as potential effects on a number of Key Ornithological Receptors (KORs), are identified in Section 7.4.2 of Chapter 7.

The Proposed Project has been designed to minimise permanent land-take and excavation through the use of existing forestry tracks and previously disturbed areas where practicable, while temporary construction areas will be reinstated following completion of the works. Measures outlined in Chapter 7, Chapter 8 and the CEMP (Appendix 4-3) will also minimise disturbance to birds during construction, including pre-construction and construction-phase bird monitoring and the establishment of appropriate disturbance buffers around sensitive nests or roosts where required. Additionally, the permanent built infrastructure footprint of the Proposed Project (c. 16.6 ha) consisting of only 2.9% of the Proposed Wind Farm site will minimise the negative residual interactive effect between Ornithology and Land, Soils and Geology.

Taking into account the mitigation measures the residual interactive effect is considered to be short-term, direct, imperceptible, and negative.

Operational Phase

During the operational phase, no significant excavation or ground disturbance will be required during normal operation of the Proposed Project. The Permanent infrastructure footprint will remain in place, and therefore the land-use and habitat changes established during construction will persist throughout the operational life of the Proposed Wind Farm.

As no significant ground disturbance is expected during normal operation, no additional significant interaction with ornithological receptors is anticipated.

Notwithstanding the above, the habitat enhancement measures outlined within the BEMP (Appendix 6-4) will provide permanent nesting, roosting and foraging habitat for a range of avian species throughout the Site, as well as suitable habitat for prey species of these species through the establishment of 11.6ha of Dry calcareous grassland, bolstering of existing hedgerow (c. 3.4km) and planting of new native hedgerows (c. 225m).

Taking into account the mitigation measures the residual interactive effect is considered to be long-term, imperceptible, indirect and neutal.

Decommissioning Phase

Interactive effects during the decommissioning phase will generally be similar to those arising during construction, principally through localised ground disturbance, plant movement and temporary disturbance of habitats used by birds. However, Chapter 8 identifies decommissioning effects as being of a lower magnitude than those arising during construction due to the more limited extent of excavation and ground disturbance. Relevant construction-phase mitigation measures will also be applied during decommissioning, while Chapter 7 provides for bird monitoring during the decommissioning phase.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is not significant

Orithology and Hydrology & Hydrogeology

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 effects on birds and their prey species (via impacts 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 Chapter 7, Chapter 9 and the CEMP (Appendix 4-3),

The residual interactive effect during the construction phase is considered to be short term, imperceptible, negative, indirect and unlikely.

Operational Phase

During the operational phase, the potential for interaction between Ornithology and Hydrology and Hydrogeology will be substantially reduced compared with the construction phase. Chapter 9 identifies operational risks to water quality principally in relation to drainage, periodic maintenance activities and the potential for accidental spills or leaks, with possible effects including sedimentation, changes in water colour or clarity and hydrocarbon contamination. These effects could, in the absence of

mitigation, adversely affect aquatic habitats and associated biota and thereby result in indirect effects on birds which rely upon watercourses, wetlands or aquatic prey resources.

Operational drainage will continue to be managed in accordance with the Surface Water Management Plan (Appendix 4-5 Section 3.1.3), including continued water-quality monitoring. Consequently, significant consequential effects on birds arising from changes to the hydrological environment are not anticipated during the operational phase.

Following implementation of mitigation measures for surface waters the residual interactive effect between ornithology and hydrology and hydrogeology is direct, neutral, long term, likely .

Decommissioning Phase

Site activities during the decommissioning phase of the Proposed Project may have the potential to give rise to some water pollution, and consequential effects on birds and their prey species (via impacts such as disturbance and deterioration of habitat quality) that use that water within the same catchment. 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 phases of the Proposed Project is not significant.

Orithology 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. The mitigation measures outlined in Chapter10 and the CEMP (Appendix 4-3) of the EIAR will ensure that the potential for negative effects is reduced or eliminated. The residual interactive effect is thereby considered to be short-term, imperceptible, indirect, negative and unlikely.

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 indirect positive effect on air quality for biodiversity.

Decommissioning Phase

During the decommissioning phase of the Proposed Project, increased vehicular and dust emissions within and around the Site have the potential to be a nuisance to birds. 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 much lesser extent and lesser duration, given the lack of excavation works required and reduced traffic generation associated with decommissioning works.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is not significant.

Orithology 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 Proposed Wind Farm site. Given the quantity of greenhouse gases that will be emitted to the atmosphere and will be restricted to the duration of the construction phase.

The residual interation of the Proposed Project on Ornithology will be negative, imperceptible, long term, indirect effect,

Operational Phase

Climate change is one of the biggest threats to biodiversity, inclusive of bird species such as Golden Plover, Kingfisher and Lapwing. Climate change is artificially accelerating due to human activities which release greenhouse gases and other chemicals. 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 residual interaction of the Proposed Project on Ornithology will be long term, moderate, indirect, positive effect Ornithology.

Decommissioning Phase

The decommissioning of the Proposed Project will result in greenhouse gas emissions associated with operation of vehicles and plant. 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 phases of the Proposed Project is not significant.

Orithology and Noise & Vibration

Construction Phase

Site activity during the construction phase could give rise to noise and vibration that could cause disturbance effects on birds which use the Site. Best practice mitigation measures are included in Chapter 7 and Chapter 12 and the CEMP (Appendix 4-3) to minimise the potential negative effect of noise generated during the construction phase. Accounting for the mitigation measured mentioned the residual effect of noise and vibration during construction on birds is considered to be short-term, not significant, direct and negative.

Operational Phase

The limited onsite noise activity generated by the Proposed Project will introduce a new operational noise source into the existing environment; however, operational activity within the Site will otherwise be limited, with maintenance visits and associated vehicle movements occurring intermittently. The predicted noise levels associated with the Proposed Turbines are not considered to have potential to cause a significant effect on Ornithology within the Proposed Wind Farm site. The limited onsite noise activity generated by the Proposed Project during the operational phase will have a long-term, imperceptible, indirect and neutral effect on Ornithology.

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 much lesser extent and lesser duration due to the lack of excavation works and lesser traffic generation during the decommissioning phase.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is not significant..

17.2.4 Land, Soils and Geology

Land, Soils & Geology, and Hydrology & Hydrogeology

Construction Phase

As identified in Chapter 8 Section 8.5.2.4 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 not significant, negative effects on water quality are presented in Chapter 8, Chapter 9, and the CEMP (Appendix 4-3).

As identified in Chapter 8 Section 8.5.2.3 of this EIAR, the accumulation of small spills of fuels and lubricants during routine plant use can also be a significant pollution risk. Hydrocarbon has a high toxicity to humans, and all flora and fauna, including fish, and is persistent in the environment. Large spills or leaks have the potential to result in significant effects (i.e. contamination of soil, subsoils and pollution of the underlying aquifer) on the geological and water environment.

Proposed Wind Farm infrastructure inside the mapped Clomantagh/Killoshulan (Balief) Group Water Scheme (GWS) includes 4 no. turbines locations (T1 to T4). Only turbine locations T1 to T3 are underlain by limestone bedrock. Turbine location T4 is underlain by mudstone bedrock as confirmed by site specific drilling, Chapter 9, Section 9.5.2.1. From hydrogeological impact assessment interest, a detailed commentary of the site investigations carried out at Proposed Turbines T1 to T4 is provided in Section 9.3.9.3. The investigations demonstrate that Proposed TurbineT1 to T3 foundations can be constructed on competent limestone and away from the nearby identified potential subsurface karst features. Proposed Turbine T4 will be constructed on mudstone bedrock.In terms of potential effects, quantity effects (i.e. flows/spring discharge volumes) could potentially arise due to deep excavations, dewatering etc in the bedrock aquifer that supplies groundwater to the spring and other private wells.

Due to the nature of the groundwater flows to the spring (i.e. likely deep bedrock conduit flow), significantly deep excavations, for example turbine base constructed below the top of bedrock, could have the potential to significantly affect flows to the source springs and other private wells

The residual interactive effect between Land, Soils and Geology, and Hydrology and Hydrogeology with the proposed design measures and mitigation measures, is negative, imperceptible, indirect, temporary, unlikely effect on Clomantagh/Killoshulan GWS and other local wells source quality and quantity.

Operational Phase

The potential for effects is much more limited than those associated with the construction phases as there is no further excavation/movement of soil/subsoil and the drainage system is fully constructed and operational.

With the mitigation measures associated with drainage management and the protection of water quality, combined with the lack of any construction type activities no residual effect of the Proposed Project will occur. No residual effect on Clomantagh/Killoshulan Group Water Scheme and Other Local Wells.

Decommissioning Phase

Site activities during the decommissioning such as minor excavation works have the potential to cause the release of sediments that may have an effect on water quality in the locality, similar to the construction phase site activities however to a lesser extent and lesser duration. The same mitigation measures implemented during the construction will be implemented during decommissioning phase

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project 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, Indirect impact on air quality. Mitigation measures outlined in Chapter 10 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 4-3).

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 due to the lack of large scale excavations and reduced traffic generation.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is not significant.

Land, Soils & Geology and Climate

Construction Phase

The construction of the Proposed Project will result in greenhouse gas emissions associated landcover change including tree felling, production of Proposed Project infrastructure, and the loss of carbon fixing vegetation within the Proposed Wind Farm site. On this basis, the residual interactive effect between Land, Soils and Geology and Climate will be permanent, imperceptible and negative.

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 due to the absence of large excavations and reduced traffic generation.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project 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 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. Mitigation measures outlined in Chapter 14 will reduce the potential for negative effects on unrecorded sites and artefacts during excavations.

Operation Phase

No interactive impact anticipated.

Decommissioning Phase

Similarly to the construction phase, there will be no 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. The potential for direct or indirect negative effects on previously unrecorded monuments is significantly less that during the construction phase as there are no large excavation works required to facilitate the decommissioning of the Proposed Project.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is not significant.

Land, Soils & Geology and Landscape & Visual

Construction Phase

The removal of some forestry, spoil and natural surfaces and the subsequent replacement with crushed stone for the construction of the site roads and hardstanding areas within the Proposed Wind Farm site has the potential to alter the local landscape. The visual effect of this change is expected to be short-term, negative and slight.

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 due to the absence of large excavations and reduced traffic generation.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project is not significant

17.2.5 Air Quality

Air Quality and Material Assets

Construction Phase

The transport of turbine components, supporting infrastructure materials, construction and staff vehicles, aggregate materials and waste removal vehicles to, from and within the Proposed Project has the potential to give rise to localised dust and exhaust emissions during the construction phase, particularly during periods of dry weather. Track-out of mud and dust onto the public road network also has the potential to generate localised dust emissions along the construction access routes.

In the absence of mitigation, construction traffic movements and associated track-out have the potential to result in short-term, slight, negative effects on air quality. However, with the implementation of the dust and traffic management measures outlined in Chapter 10, Chapter 15.1 and the CEMP, including measures relating to the control of dust, track-out and the cleanliness of public roads, residual effects on air quality associated with construction traffic will be short-term, imperceptible and negative.

Operational Phase

Traffic during the operational phase will be minimal and generally limited to maintenance visits by car or light goods vehicle. The Proposed Grid Connection will also generate only occasional maintenance trips. On occasion, more frequent light goods vehicle or heavy goods vehicle visits may be required for maintenance or component replacement.

The resulting exhaust and dust emissions will give rise to a long-term, imperceptible, indirect, negative effect on air quality.

Decommissioning Phase

Traffic associated with decommissioning will be lower than during construction, as the importation of stone and concrete for access tracks and turbine foundations will not be required. There will be minor excavation works but none requiring the level of plant associated with the construction phase. Any interaction and consequential effect during the decommissioning phase will be similar to that during construction, but of lesser magnitude and duration. construction-phase mitigation measures will also be implemented during decommissioning.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project 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 tree felling, production of Proposed Project infrastructure and construction materials, and operation of vehicles and plant. 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 Chapter 11 of this EIAR, and mitigation measures are presented to minimise any potential effects.

This impact will be negative and imperceptible given the quantity of greenhouse gases that will be emitted to the atmosphere and will be restricted to the duration of the construction phase.

Operational Phase

During the operational phase, the interaction between Material Assets and Climate relates primarily to the reduction in greenhouse gas emissions resulting from the generation of renewable electricity and the consequent reduction in reliance on fossil fuel-based electricity generation

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 28,277 tonnes of carbon dioxide per annum or 989,687 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

Greenhouse gas emissions during the decommissioning phase will arise principally from the operation of plant and machinery and traffic associated with dismantling and removing the Proposed Turbines and ancillary infrastructure. Traffic associated with decommissioning is expected to be lower than during construction, as significant construction-phase activities such as the importation of stone and concrete for access tracks and turbine foundations will not be required.

Construction-phase mitigation measures will also be implemented during decommissioning, where relevant. The resulting residual effect on climate is assessed as short-term, imperceptible, direct and negative, which is not significant.

On this basis, the identified interaction during the construction, operation and decommissioning phases of the Proposed Project 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. It is considered that the changes in landscape construction phase will have a slight, short-term, negative, direct effect in terms of direct landscape effects.

Operation Phase

As described in Chapter 14 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 Chapter 14 that the nearest potential archaeological landscapes identified in the Kilkenny County Council Development Plan 2021-2027 is Freestone Hill which is situated c. 23km to the south-east. Given the distance of the Proposed Project from Freestone Hill no potential visual effects to its immediate or wider setting are identified.

On this basis, the identified interaction during the operation phase of the Proposed Project is neutral.

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 phases of the Proposed Project is not significant

17.2.8 Vulnerability to Natural Disasters

Construction, Operation and Decommissioning Phase

As described in Chapter 16 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, land and soil, hydrology and hydrogeology, air quality, climate, material assets, cultural heritage, and the landscape.

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

When 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.

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 Chapter 18 and the CEMP. The implementation of these mitigation measures will reduce or remove 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.

APPENDIX 1

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