

16. MAJOR ACCIDENTS AND NATURAL DISASTERS

16.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) describes the likely significant adverse effects on the environment arising from the vulnerability of the Proposed Project (Wind Farm Site and Grid Connection) as detailed in Chapter 4 to risks of major accidents and/or natural disasters, as well as the potential of the Proposed Project itself to cause potential major accidents and/or natural disasters. It has been completed in accordance with the guidance set out by the Environmental Protection Agency (EPA) in ‘*Guidelines on Information to be contained in Environmental Impact Statements*’ (EPA, 2022) and the European Commission in relation to Environmental Impact Assessment of Projects (Directive 2011/92/EU, as amended by 2014/52/EU), namely ‘*Guidance on the preparation of the Environmental Impact Assessment Report*’.

The assessment of the vulnerability of the Proposed Project to major accidents and natural disasters, as well as the risk of the Proposed Project itself causing accidents or disasters is carried out in compliance with the EIA Directive 2011/92/EU, as amended by 2014/52/EU, which states the need to assess:

“the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or natural disasters which are relevant to the project concerned.”

The objective of this assessment is to ensure that appropriate precautionary actions are taken for the Proposed Project.

“because of their vulnerability to major accidents and/or natural disasters, are likely to have significant adverse effects on the environment”.

Based on the requirements of the EIA Directive, this chapter seeks to determine:

- The relevant major accidents and/or natural disasters, if any, that the Proposed Project could be vulnerable to;
- The potential for these major accidents and/or natural disasters to result in likely significant adverse environmental effect(s); and
- The measures that are in place, or need to be in place, to prevent or mitigate the likely significant adverse effects of such events on the environment.

The full description of the Proposed Project is provided in Chapter 4 of this EIAR.

As detailed in Section 1.1.1 in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references: ‘Proposed Project’.

16.1.1 Statement of Authority

This chapter of the EIAR has been prepared by Jonny Fearon and reviewed by Eoin McCarthy. Jonny is a Project Environmental Scientist with MKO having joined the company in March 2022. Since joining MKO, Jonny has been involved in a range of wind farm projects. In his role as an 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. Eoin McCarthy holds a BSc. (Env.) in Environmental Science and is a Project Director with 14 years’ experience in the

consultancy sector. His project experience includes a significant range of energy infrastructure, tourism, waste permit, flood relief scheme and quarrying projects in addition he has been involved in the project management of the production of EIARs for almost 1GW worth of wind energy projects. Eoin has completed the Major Accidents section for numerous EIARs for wind energy projects.

16.2 Assessment Methodology

16.2.1 General

The following sources of information and literature pertinent to the area were used in the preparation of this section:

- Census of Ireland 2016; 2022
- Regional Planning Guidelines for the South-East Region 2010-2022
- Regional Planning Guidelines for the Mid-West Region 2010-2022
- Regional Spatial and Economic Strategy (RSES) 2019-2031, adopted by the Eastern and Midland Regional Assembly (EMRA) in June 2019 and published by the Southern Regional Assembly (SRA) on 31st January 2020.
- Tipperary County Development Plan 2022-2028
- Limerick County Development Plan 2022-2028
- Tipperary County Council Website, Limerick County Council Website, and
- Fáilte Ireland

Major accidents or natural disasters are hazards which have the potential to affect the Proposed Project and lead to environmental effects 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 risk of major accidents and/or disaster is considered in relation to the information required to be provided in the EIAR, i.e., population and human health, biodiversity, land, soils, water, air and climate, material assets and cultural heritage. This is addressed through determining the legislative context, categorising the baseline environment, and determining a methodology for the impact assessment of the vulnerability of the Proposed Project to risks of major accidents and/or natural disasters, as well as the potential of the Proposed Project itself to cause potential major accidents and/or natural disasters.

16.2.2 Legislative Context

16.2.2.1 Legislation

An assessment of the following key elements was undertaken in accordance with the EIA Directive 2011/92/EU, as amended by 2014/52/EU:

- The vulnerability of the Proposed Project to potential accidents and disasters.
- The Proposed Project's potential to cause major accidents or disasters which pose a risk to human health, cultural heritage and/or the environment.

The information relevant to major accidents and/or disasters to be included in the EIAR is set out in paragraph 8 of Annex IV of the EIA Directive as follows:

“(8) A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European

Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies”.

16.2.2.2 Guidance Documents

The below guidance documents have been followed in the preparation of this chapter:

- European Commission (2017). *Environmental Impact Assessment of Projects – Guidance on the preparation of Environmental Impact Assessment Reports.*
- Environmental Protection Agency (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.*
- Department of Environment, Heritage and Local Government (2010) *A Guide to Risk Assessment in Major Emergency Management.*
- Department of Housing, Local Government and Heritage (2024). *A Framework for Major Emergency Management – A Guide to Regional Risk Assessment.*
- Environmental Protection Agency (2014) *Guidance on Assessing and Costing Environmental Liabilities.*
- Department of the Taoiseach (2024) *National Risk Assessment 2024 – Overview of Strategic Risks.*
- Government of Ireland (2024) *National Risk Assessment 2024*
- Tipperary County Council (2014) *Major Emergency Plan.*
- Limerick City and County Council (2014) *Major Emergency Plan.*

16.2.3 Categorisation of the Baseline Environment

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

Further detail on the baseline environment is provided in Section 16.3.

16.2.4 Impact Assessment Methodology

16.2.4.1 Introduction

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

There is low potential for significant natural disasters to occur at the Proposed Project. Ireland is a geologically stable country with a mild temperate climate. The potential natural disasters that may occur are therefore limited to issues such as flooding and fire and are described in the Sections below.

Major industrial accidents involving dangerous substances pose a significant threat to humans and the environment; such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the Site of the accident. The Proposed Project is not regulated or connected to or close to any site regulated under the Control of Major Accident Hazards Involving Dangerous Substances Regulations i.e., SEVESO sites and so there are no potential effects from this source. The nearest SEVESO site to the Proposed Wind Farm is MSD Ireland (Upper Tier SEVESO site) which is located approximately 45.7km southeast from the Proposed Wind Farm. There are two SEVESO sites located within 10km to the Proposed Grid Connection Route. Analog Devices International (Lower Tier SEVESO site) is located approximately 8km south west of the Proposed Grid Connection Route and Grassland Agro (Upper Tier SEVESO site) is located approximately 7.6km west from the Proposed Grid Connection Route. Given the distance between the Proposed Project and the SEVESO sites the potential for interaction or impact is considered negligible.

The Proposed Wind Farm site has low potential to cause natural disasters or major accidents. As detailed in Section 8.6.5 in Chapter 8 of this EIAR, the EPA published soil map (www.epa.ie) and the GSI subsoil mapping (www.gsi.ie) shows the mapped distribution of subsoil deposits around the Proposed Wind Farm. Poorly drained mineral soils derived from mainly non-calcareous parent materials (AminPD) is the dominant soil type mapped at the Proposed Wind Farm site. There is no peat mapped at or locally to the Proposed Wind Farm site. Smaller areas further on the north of the Proposed Wind Farm site are mapped to comprise deep well drained mineral (Mainly acidic) soils (AminDW) and shallow well drained (mainly acidic) soils (AminSW). These soils are also sparsely mapped along the boundaries of the Proposed Wind Farm site on the east, west and south. Alluvium soil is mapped along the Lackenacoombe Stream and Glasheenreagha Stream within the Proposed Wind Farm site and also along the Aughnaglanny River and Multeen River to the east and west of the Proposed Wind Farm site respectively. Due to the absence of peat and the absence of any significant karst features, there is a low risk of a landslide occurring

The Proposed Grid Connection Route is located predominantly within the public road network. Soils along the Proposed Grid Connection underground cabling route are broadly mapped as deep well drained mineral (Mainly acidic) (AminDW), mineral poorly drained (Mainly acidic) (AminPD) and mineral poorly drained (Mainly basic) (BminPD) (www.gsi.ie). Cut over raised peat can be found along the Proposed Grid Connection route in the townlands of Cooga Lower, Gortavalla North, Knockacarriga, Ballycoshown, Dromsallagh, Dromcluhur, Eyon, Clooncunna North and Cunnihoe Co. Limerick. The Proposed Grid Connection is within the curtilage of the public road network in these townlands and therefore there is no risk of peat instability along the Proposed Grid Connection underground cabling route.

Any risks associated with flooding, impacts on infrastructure, accidents etc are addressed in the sections below.

Current EIA practice already includes an assessment of some potential accidents and disaster scenarios such as pollution incidents to ground and watercourses as well as assessment of flooding events. These are described in detail below and in the relevant EIAR assessment chapters (Refer to Chapters 5 to 15 for further detail).

16.2.4.2 Site-Specific Risk Assessment Methodology

A site-specific risk assessment identifies and quantifies risks focusing on unplanned, but possible and plausible events occurring during the construction, operation and decommissioning of the Proposed Project. The approach to identifying and quantifying risks associated with the Proposed Project by means of a site-specific risk assessment is derived from the DoEHLG 'A Framework for Major Accident

Emergency Management – A Guide to Regional Risk Assessment' 2024 document¹. The following steps were taken as part of the Site-specific risk assessment:

- > Risk identification
- > Risk, Analysis of likelihood and impact; and
- > Risk evaluation

16.2.4.2.1 **Risk Identification**

Risks have been reviewed through the identification of reasonably foreseeable risks in consultation with relevant contributors to this EIAR and relevant major emergency response plans. The identification of risks has focused on non-standard but plausible incidents that could occur at or as a result of the Proposed Project during construction, operation and decommissioning.

In accordance with the European Commission EIAR Guidance², risks are identified in respect of the Proposed Project:

1. *Potential to cause accidents and/or disasters,*
2. *Vulnerability to potential disaster/accident*

16.2.4.2.2 **Risk Analysis**

Identify the Reasonable Worst-Case Scenario (RWCS)

The RWCS is defined in BS EN 31010:2010 p85/3 as “The most serious credible outcomes consequences” for each risk.

Classification of Likelihood

After identifying the potential risks and RWCS, the likelihood of occurrence of each risk has been assessed. An analysis of safety procedures and proposed environmental controls was considered when estimating likelihood of identified potential risks occurring. Table 16-1 defines the likelihood ratings that have been applied.

The approach adopted has assumed a ‘risk likelihood’ where one or more aspects of the likelihood description are met.

Table 16-1 Classification of Likelihood (Source: DoEHLG, 2024)

Ranking	Classification	Average Recurrence Interval*
1	Extremely Unlikely	100 or more years between occurrences
2	Very Unlikely	51-100 years between occurrences
3	Unlikely	11-50 years between occurrences

¹ EPA (2014) *Guidance on assessing and costing environmental liabilities*. Available at https://www.epa.ie/publications/compliance-enforcement/licenses/reporting/financial-provisions/EPA_OEE-Guidance-and-Assessing-WEB.pdf

² European Commission (2017). *Environmental Impact Assessment of Projects – Guidance on the preparation of Environmental Impact Assessment Reports*

4	Likely	1-10 years between occurrences
5	Very Likely	Ongoing/Less than one year between occurrences

**Note: statistical estimate of the average period of time between occurrences of an event of given scale*

Classification of Impact

The Impact rating assigned to each risk has assumed that all proposed mitigation measures and/or safety procedures have failed to prevent the major accident and/or disaster. Furthermore, the Limerick City and County Council Major Emergency Plan (2014) and the Tipperary County Council Major Emergency Plan (2014), will work to reduce the consequence of any major accident or disaster. The consequence of the impact if the event occurs has been assigned as described in Table 16-2, which is used to position all the identified hazards on the risk matrix described below.

The consequence of a risk to/from the Proposed Project has been determined where one or more aspects of the consequence description are met, i.e., risks that have no consequence have been excluded from the assessment.

Table 16-2 Classification of Impact (Source: DoEHLG, 2024)

Impact Category	People	Environment	Essential Services	Social
1 Very Low Impact	Deaths less than 1 in 250,000 people for population of interest OR Critical injuries/illness less than 1 in 250,000 OR Serious injuries less than 1 in 100,000 OR Minor injuries only	Simple localised contamination	Very low disruption to the delivery of services essential for the maintenance of vital societal functions or economic activities	Limited disruption to community
2 Low Impact	Deaths greater than 1 in 250,000 people for population of interest OR Critical injuries/illness greater than 1 in 250,000 OR Serious injuries greater than 1 in 100,000	Simple, regional contamination, effects of short duration	Low disruption to the delivery of services essential for the maintenance of vital societal functions or economic activities	Community functioning with considerable inconvenience
3 Moderate Impact	Deaths greater than 1 in 100,000 people for population of interest	Heavy contamination localised effects of extended duration	Medium disruption to the delivery of services essential for the maintenance	Community functioning poorly

Impact Category	People	Environment	Essential Services	Social
	OR Critical injuries/illness greater than 1 in 100,000 OR Serious injuries greater than 1 in 40,000		of vital societal functions or economic activities	
4 High Impact	Deaths greater than 1 in 100,000 people for population of interest OR Critical injuries/illness greater than 1 in 100,000 OR Serious injuries greater than 1 in 40,000	Heavy contamination, widespread effects or extended duration	High disruption to the delivery of services essential for the maintenance of vital societal functions or economic activities	Community only partially functioning
5 Very High Impact	Deaths greater than 1 in 40,000 people for population of interest OR Critical injuries/illness greater than 1 in 40,000 OR Serious injuries greater than 1 in 20,000	Very heavy contamination, widespread effects of extended duration	Loss of delivery of services essential for the maintenance of vital societal functions or economic activities	Community unable to function without support

Risk Evaluation

Once classified, the likelihood and consequence rankings have been multiplied to establish a ‘risk score’ to support the evaluation of risks within the Risk Matrix Zone.

The Risk Matrix Zone sourced from the DoEHLG (2024) ‘*A Framework for Major Emergency Management – A Guide to Regional Risk Assessment*’ has been amended to align with the EPA (2014) Guidance on assessing and costing environmental liabilities’ risk matrix (and as outlined in Table 16-3) indicates the critical nature of each risk. This Risk Matrix Zone has then been applied to evaluate each of the risks associated with the Proposed Project. The Risk Matrix Zone is colour coded to provide a broad indication of the critical nature of each risk:

- The red zone represents ‘high risk scenarios’;
- The amber zone represents ‘medium risk scenarios’; and
- The green zone represents ‘low risk scenarios.’

Table 16-3 Risk Matrix Zone (Source: EPA, 2014)

		Consequence Rating				
		1.Minor	2.Limited	3. Serious	4.Very Serious	5.Catastrophic
Likelihood Rating	5.Very Likely	Green	Amber	Red	Red	Red
	4. Likely	Green	Amber	Amber	Red	Red
	3. Unlikely	Green	Green	Amber	Amber	Red
	2. Very Unlikely	Green	Green	Green	Amber	Amber
	1. Extremely Unlikely	Green	Green	Green	Green	Green

16.3

Baseline Conditions

The Major Emergency Plan prepared by Tipperary County Council (2014) outlines the following potential major emergency scenario in the county (Tipperary):

1. **Urban Flooding:** Applicable to urban areas within the functional areas of Tipperary County Council.
2. **Aircraft Collision/Loss:** Relevant to all air strips or aircraft within the functional area of Tipperary County Council.
3. **Water Contamination:** Tipperary County Council Functional Areas.
4. **Credible scenario incidents at Merck Sharp & Dohme:** Applicable to Ballydine area Co. Tipperary.
5. **Fire/Major Crowd Safety and Civil Disorder:** Tipperary County Council Functional Areas.
6. **Major Road Traffic Accident/ Hazardous Material (Hazmat):** M7 Motorway, National Primary Routes, Iarnród Eireann.
7. **Natural Gas Explosion along the main Cork-Dublin Gas Line:** Applicable to sections of the line that reach Co. Tipperary.
8. **Loss of Critical IT Infrastructure:** Tipperary County Council Functional Area.
9. **Rail Incident:** Applicable to Irish Rail infrastructure such as the Cork to Dublin Line within Tipperary County Council Functional Area.

The Major Emergency Plan prepared by Limerick City and County Council (2014) outlines the following potential major emergency scenario in the county (Limerick):

1. **Flooding/ Severe Weather** - Applicable to urban areas within the functional areas of Limerick City and County Council.
2. **Major Road Traffic Accident**, National Primary Routes, Iarnród Eireann.
3. **Large Forest Fire** – Limerick City and County Functional Areas.
4. **Public Water Supply (Contamination / Reduction in Supply)** – Nearby watercourses.
5. **Civil Disorder at Large Events** – Limerick City and County Council Functional Areas.
6. **Adverse Weather Conditions** – Limerick City and County Council Functional Areas

The HSE Emergency Management: Area 5 Crisis Management Team Major Emergency Plan and the HSE Mid-West Regional Major Emergency Plan (Clare, Limerick, North Tipperary) outlines several hazard categories which may have the potential to lead to a major emergency in Area 5 Covering Geographical Areas of Counties Carlow, Kilkenny, South Tipperary, Waterford and Wexford. The hazard categories include Natural, Transportation, Technological and Civil. The hazard categories, types and subtypes, and their relevance to the Proposed Project during all stages (i.e., construction, operation and decommissioning stage), prior to the implementation of mitigation measures, are listed below in Table 16-4.

Table 16-4 - HSE Emergency Plan hazard identification (Area 5 Crisis Management Team Major Emergency Plan)

Natural Hazards			
Category	Type	Subtype	Relevant Hazard to the Proposed Project
Meteorological	Storm / Gale Both coastal and inland areas can be affected by high winds	Both coastal and inland areas can be affected by high winds	Poor driving conditions Flooding Falling Trees

	Heavy Snow	Blizzards- Poor visibility	Poor Driving conditions Ice falling from turbine blades
	Severe Cold / Frost extremes of Temperature	Icy Roads /Impassable Roads Hypothermia Freezing of Supply Network	Poor Driving Conditions Public Health Risk Lack of Road Grit
	Thunder & Lightning Dense/ Persistent Fog Heat Wave /Drought	Road Traffic collisions	Loss of Infrastructure Poor driving conditions Public Health Risk Water Shortage
Hydrological	Flooding	Coastal / Inland	The risk of flooding at the Proposed Wind Farm site is low due to the elevated and sloping nature of the Site and the presence of streams which flow rapidly downslope. The Proposed Grid Connection is generally at a low risk of flooding. Refer to Appendix 9-1 of this EIAR for a site-specific flood risk assessment.
	Heavy Rain		As noted in Section above, risk of flooding at the Proposed Wind Farm site and Proposed Grid Connection is low. Furthermore, based on the CFRAM rainfall (pluvial) flood mapping, surface water ponding/flooding is not a notable issue at the Proposed Wind Farm site. Please see Section 9.3.2 of Ch. 9: Water and Appendix 9-1 for further detail.
Geological	Landslide		As outlined in Section 8.6.5 of Chapter 8, due to the Proposed Wind Farm site ground conditions (i.e. absence of blanket peat, the firm nature of thin overburden/glacial till coverage, the competency of the underlying bedrock, the lack of recorded historic landslide events along with the predominately Low Landslide Susceptibility rating from the GSI) the risk of ground

			instability/landslide occurring at the Proposed Wind Farm site is low.
	Forest / Wilderness fire - Air Pollution		Majority of the Proposed Wind Farm site and some of surrounding area is forested. Potential for mechanical fire within turbine. With mitigation measures in place the risk of a forest fire at the Proposed Wind Farm site and the Proposed Grid Connection is not significant.
Transportation Hazards			
Category	Type	Subtype	Relevant Hazard to the Proposed Project
Aviation	Aircraft Collision /Loss	Mid Air and Land	Shannon Airport – Approximately 55km from the Proposed Wind Farm site. All turbines will be fitted with Aviation warning lights
Rail	Mainline		Not Applicable
	Bridge		Not applicable
Road	Multiple Road Traffic Collision		Public Roads via which construction staff and materials access the Site.
	Hazmat		Fuel Transport to/from site.
	Bridge		23 no. watercourse crossings on Proposed Grid Connection route.
Water	Inland Water ways	Pleasure Craft/Cruises Pollution from above	Potential for pollution to waterways during transportation of material to the Proposed Wind Farm site and along the Proposed Grid Connection.
	Coastal	Car Ferry/ passenger Ferries	Not Applicable
Technological Hazards			

Category	Type	Subtype	Relevant Hazard to the Proposed Project
Industrial Accidents	Explosions		Damage to Infrastructure Personal Injuries/ fatalities.
	Petrochemical Fires		Personal Injuries, severe burns/ fatalities. Air Pollution
	Industrial Fires	LPG Tank Fire	Not Applicable
	Gas Emission		Not Applicable
	Fluid/ Fuel Emission		Refuelling on site
Explosions	Domestic	Natural Gas explosion	Not Applicable
	Bomb		Controlled blasting at Borrow Pit locations
	LPG		Not Applicable
	Pipeline		Not Applicable
Fires			Air Pollution
Building Collapse			Collapse of substation building.
Hazardous substance		Accident at site	Release of hydrocarbons on-site
		Transportation accident	Hazmat on roads
		Weapons	Not Applicable
	Biological	Leak/Weapons	Not Applicable
	Radiological	“Dirty Bomb”	Not Applicable
		Industrial Accident	Not Applicable
		Health facilities	Not Applicable
Pollution/Contamination	Air/Water Pollution		Fire Sediment-laden Water Run Off Fuel/hydrocarbon spill/leak.
	Extractive Mining Sites	Category A Extractive Sites	Not Applicable
Civil Hazards			

Category	Type	Subtype	Relevant Hazard to the Proposed Project
Civil Disorder / Disturbance	Protest		Not Applicable
	Rioting		
Major Crowd Safety	(Movement, crushing etc.)	Pop Concerts Sports Events Fireworks Air shows	Not Applicable
Loss of Critical Infrastructure	Energy and Power Supply	Electricity	Connection to national grid
		Natural Gas	Not Applicable
		Fuel Oil	Not Applicable
		Communications	Telecom operators, mobile phone networks.
Food Situation Crisis		Food Contamination Drought	Not Applicable
Water Supply		Shortage/ Contamination Freezing /Flooding	Not Applicable
Epidemics and pandemic		Communicable diseases	Not Applicable
Animal Disease		Foot & Mouth Avian Influenza	Not Applicable
Terrorism	Bombs	Car-bombs	Not Applicable
		Bombs in buildings	Not Applicable
		Fire-bombing	Not Applicable
	CBRNE		Not Applicable
	Disruption	Bomb scares	Not Applicable

16.3.1 Risks to the Proposed Project (Tipperary)

The risks, outlined in the Tipperary Major Emergency Plan, which are most relevant to this assessment are described below:

Urban Flooding

The Proposed Project is not located within an urban area; therefore, the urban flooding scenario is not applicable.

Chapter 9 and the accompanying Appendix 9-1 Flood Risk Assessment (FRA), detail the flood risk of the Proposed Project site. Based on the information provided in the stated documents, the areas of the Proposed Project at risk of flooding were identified.

Through an iterative process of flood modelling and the design of the infrastructure locations around the modelled flood zones, the layout of the Proposed Project has been optimized.

No recorded historic or recurring flooding is within the Proposed Wind Farm site. The nearest historic flooding occurs approximately 3.6km southeast of the Proposed Wind Farm site along the Multeen (East) River and at nearby lake segments. While low and medium probability fluvial flood zones are mapped along the Aughnaglanny River at the Site boundary, these are largely confined to the river channel and do not significantly encroach into the Site. Overall, the Proposed Wind Farm site is located in Flood Zone C, indicating a low risk of fluvial flooding, with no identified groundwater or significant surface water flood risk.

NIFM and CFRAM fluvial flood zones were mapped along the Proposed Grid Connection cable route at major watercourse crossing locations, but this potential flooding has no consequence for the Proposed Grid Connection cable due to the underground nature of the cabling. The 110kV substation element of the Proposed Grid Connection within the Proposed Wind Farm site is located in Flood Zone C (low risk) as described in Section 9.3.2 of Chapter 9 in this EIAR.

Furthermore, the Proposed Project will be constructed with its own drainage system which will provide additional surface water attenuation. The overall risk of flooding posed at the Proposed Wind Farm site is assessed to be low, and all proposed infrastructure will be located at or above Flood Zone C elevations. Please refer to the Chapter 9 Water of this EIAR for further details.

Aircraft Collision/ Loss

The Proposed Project will not utilise air strips or aircraft for the delivery of turbine components. Delivery of turbines and their associated components will be via the national and local road network.

The Proposed Project has the potential to affect aviation due to the erection of manmade structure in excess of 45 metres that may constitute an obstacle to air navigation. These impacts are addressed in detail in Section 15.2 in Chapter 15 of this EIAR: Material Assets. The scoping response from the Irish Aviation Authority (IAA) set out that in the event of planning consent being granted, the applicant should be conditioned to contact the IAA to (1) agree an aeronautical obstacle warning light scheme for the wind development, (2) provide as-constructed coordinates in WGS84 format together with ground and blade tip height elevations at each wind turbine location and (3) notify the IAA of intention to commence crane operations with at least 30 days prior notification of their erection. The coordinates and elevations for built turbines will be supplied to the IAA, as is standard practice for wind farm developments.

Following the guidance above, consultation with the IAA and the Department of Defence (DoD) has been carried out by MKO as part of the assessment of the Proposed Project and are summarised in Section 15.2.6.3.2 of Chapter 15 of this EIAR.

Water Contamination

The Proposed Project has the potential to cause contamination and pollution of groundwater and surface water from potential release of hydrocarbons, earthworks and excavations on Site. These impacts are addressed in detail in the Chapter 9 of this EIAR: Water and are not related to either the vulnerability of the Proposed Project to natural disasters or major accidents nor the potential for the Proposed Project to cause natural disasters or accidents.

There is potential for hazardous materials in the form of hydrocarbons to be transported to and used on the Proposed Project. Mitigation measures as best practise as detailed in Chapter 9 Water and the Construction and Environmental Management Plan (CEMP) (Appendix 4-3), respectively, will minimise the potential for leaks and will break the potential pathways between any source and receptor therefore resulting in no residual effects. The removal of hazardous materials will be done so by licenced operators for disposal at licenced waste facilities. There will be no potential for hazardous material release during the operational phase of the Proposed Project.

The release of wastewater at the Proposed Project and along the grid connection underground electrical cabling route can pose a risk to down gradient groundwater wells, groundwater quality and surface water quality. Proven and effective methods to mitigate against these potential impacts have been outlined above which will break the potential pathways between any source and receptor therefore resulting in no residual effects. Indirect impacts associated with major accidents and / or natural disasters on contamination are considered further in Section 16.4.1.6.

Credible scenario incidents at Merck Sharp & Dohme

The European Communities Control of Major Accident Hazards Involving Dangerous Substance Regulations, 2000, applies to sites where certain quantities of specified dangerous substances are present. These sites (SEVESO Sites) are classified as upper tier and lower tier. There are two SEVESO sites both are approximately 10km from the Proposed Grid Connection, Grassland Agro (Upper Tier SEVESO site) and Analog Services International (Lower Tier SEVESO site). There is one Upper Tier SEVESO located in Ballydine, Kilsheelan, Clonmel, Co. Tipperary, MSD Ireland, located approximately 45.7km southeast from the Proposed Wind Farm. Given this distance, it is considered that neither the Proposed Project nor the SEVESO site have the opportunity to negatively impact the other.

Fire / Major Crowd Safety and Civil Disorder

The likelihood of fire occurring at the Proposed Project is anticipated to be low. The likelihood of fire occurring will be further lowered by the implementation of good site management practices during the construction, operational and decommissioning phases. Appendix 4-4 of the EIAR details the Fire Risk Management and Emergency Response Plan details in relation to the proposed Battery Energy Storage System (BESS). The Plan has been developed in relation to the effects on the environment and health and safety of the proposed Battery Energy Storage System following a fire emergency. The report outlines the mitigation design, procedures and actions to protect lives and safety of site and emergency services personnel, the protection of the environment, minimisation of damage and disruption and the return to normal operations. The report states the design factors which contribute to reducing the escalation in the severity of a potential incident, facilities for the emergency services and the safeguarding of the environment through fire water retention.

Major crowd safety and civil disorder are not relevant to the Proposed Project. Access to the Proposed Project will only be permitted for authorised operation and maintenance personnel and relevant local landowners only during the construction, operational and decommissioning phases.

Major Road Traffic Accident/ Severe Weather and Loss of Critical Transport Infrastructure

The Proposed Project will utilise the existing road network during the construction phase. Construction related traffic will comprise both turbine component and construction materials delivery and the subsequent return of empty vehicles, and daily construction staff movements to and from the Site.

It is proposed that large wind turbine components will be delivered to the Site, under Garda escort and mainly at night.

Potential impacts that may occur on the identified road networks could be caused by an accident during the delivery of the turbines, collisions onsite and offsite with vehicles involved in construction and operation of the Proposed Project. As detailed in Section 15.1 of this EIAR: Material Assets, the localised traffic disruptions due to other proposed works will be mitigated using industry standard traffic management measures. These traffic management measures will be designed in accordance with the Department of Transport's *'Guidance for the Control and Management of Traffic at Roadworks – Second Edition (2010)'*.

A strict speed limit will be imposed on the internal Wind Farm road network to reduce the likelihood of any collisions or traffic incidents. The internal Wind Farm road network and site access junctions have all been designed to reduce the likelihood of traffic incidents or collisions, with appropriate sightlines in place at all Site junctions.

A Traffic Management Plan (TMP) has been prepared in Appendix 15-2 of Chapter 15 of this EIAR.

Natural Gas Explosion along the main Cork-Dublin Gas Line

There is a potential risk of fire/explosion at the Proposed Project site. However, as outlined in Section 16.2.1, the scope of this assessment has been based on the understanding that the Proposed Project will be designed, built and operated in line with current best practice. Further, in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2014, the Proposed Project shall be subject to a fire safety risk assessment which will assist in the identification of any major risks of fire on Site.

Loss of Critical IT Infrastructure

EirGrid operates and develops Ireland's electricity grid. This includes interconnecting to neighbouring grids and running the wholesale electricity market. The grid safely brings power from generators such as wind farms to the ESB network that supplies homes and business in Ireland. It also brings power directly to large energy users. There are two types of electricity generation: synchronous generation and non-synchronous generation. Synchronous generation produces the same amount of electricity all the time e.g., fossil fuels. Non-synchronous generation produces a varying amount of electricity depending on the energy available. Eirgrid operate the grid from National Control Centres (NCCs) in Dublin and Belfast, matching electricity production to customer demand, switching from synchronous to non-synchronous where required to ensure no power outages. Therefore, any technical fault at the Proposed Project would not impact the local or national energy supply.

Rail Incident

The Dublin-Cork railway line runs approximately 4km southeast of the Proposed Wind Farm Project in a southeast to southwest orientation. The Proposed Wind Farm does not physically interact with the railway infrastructure.

The Proposed Grid Connection will cross under the Waterford-Limerick railway line in the townland of Kishyquirk, Co. Limerick. Using Horizontal Directional Drilling as described in Section 4.8.2.6.1 of this EIAR and a minimum setback as referenced below the underground cable will cross under the Waterford-Limerick railway line with no impact to the railway infrastructure.

Works relating to the construction of the Proposed Project, which will be confined to a minimum 20m set back from the railway line, will not interfere with the track, track drainage or embankment. Nonetheless, during the construction phase, the requirements for third parties as set out in 'CCE Department Technical Guidance Document CCE-TMS-310 Guidance on Third Party Works' and 'CCE Departmental and Multidisciplinary Standard I-DEP-0121 Third Party Works: Additional Details of Railway Safety Requirements' will be adhered to. Furthermore, contact will be made to IEDR 30 days prior to the works that will take place at a minimum of 20m northwest of CIE infrastructure.

16.3.2 Risks to the Proposed Project (Limerick)

The risks, outlined in the Limerick City and County Major Emergency Plan, which are most relevant to this assessment are described below:

Flooding/Severe Weather

As detailed in Chapter 9 and the accompanying Appendix 9-1 Flood Risk Assessment (FRA), detailed site-specific flood modelling was carried out on the Proposed Project.

NIFM and CFRAM fluvial flood zones were mapped along the Proposed Grid Connection cable route at major watercourse crossing locations, but this potential flooding has no consequence for the Proposed Grid Connection cable due to the underground nature of the cabling. The 110kV substation element of the Proposed Grid Connection within the Proposed Wind Farm site is located in Flood Zone C (low risk) as described in Section 9.3.2 of Chapter 9 in this EIAR.

Furthermore, the Proposed Project will be constructed with its own drainage system which will provide additional surface water attenuation. The overall risk of flooding posed at the proposed site is assessed to be low, and all proposed infrastructure will be located at or above Flood Zone C elevations. Please refer to the Chapter 9 Water of this EIAR for further details.

Major Road Traffic Accident

The Proposed Grid Connection will utilise the existing local road network during the construction phase. Construction related traffic will originate from the delivery of materials to site, removal of surplus excavated material from site and transport of employees to, from and throughout the Site. The localised traffic disruptions will be mitigated through the use of industry standard traffic management measures. Please see Chapter 15 Material Assets and Appendix 15-2: Traffic Management Plan for details.

Appendix 15-2: Traffic Management Plan (TMP) is provided specifying details relating to traffic management. Prior to the commencement of the construction phase of the Proposed Grid Connection a detailed Traffic Management Plan will be prepared by the Contractor for agreement with the relevant local authorities and An Garda Síochána. The TMP includes requirements for the following:

- > Traffic Management Coordinator.
- > Delivery Programme

- > Information to locals
- > A Pre and Post Construction Condition Survey
- > Liaison with the relevant local authority
- > Identification of delivery routes
- > Travel plan for construction workers
- > Additional measures
- > Re-instatement works

Please see Chapter 15: Material Assets and Appendix 15-2: Outline Traffic Management Plan for details.

There will be no traffic risk during the operational phase of the Proposed Grid Connection, as all works will be completed during the construction phase. Occasional maintenance or fault repair along the Proposed Grid Connection route may require short-term, localised road closures. Such events will be infrequent and are expected to result in temporary, slight, and negative effects on the local road network. Following completion of the Proposed Grid Connection works, all road corridors will be fully reinstated in accordance with a plan agreed with Limerick County Council, leaving no visible above-ground evidence of the works. Please see Chapter 15: Material Assets and Appendix 15-2: Outline Traffic Management Plan for details.

Large Forest Fire

The likelihood of fire occurring at the Proposed Project is anticipated to be low. The likelihood of fire occurring will be further lowered by the implementation of good site management practices during the construction, operational and decommissioning phases.

Public Water Supply (Contamination / Reduction in Supply)

The Proposed Project has the potential to cause contamination and pollution of groundwater and surface water from potential release of hydrocarbons, earthworks and excavations on site. A Construction Environment Management Plan (CEMP) has been prepared in conjunction with the Environmental Impact Assessment Report (EIAR) and the Natura Impact Statement (NIS) which accompanies the planning application for the Proposed Project.

Section 3 of the CEMP sets out details of the environmental controls to be implemented on site. The CEMP provided details on site drainage measures, waste management and pollution prevention measures for refuelling and managing hazardous materials and cement-based products. The CEMP also sets out the Emergency Response Procedure to be adopted in the event of an emergency including contamination, health and safety and environmental protection. The CEMP provides details on all mitigation and monitoring measures to be actioned prior to construction, during the construction and operation phase. The CEMP will be subject to ongoing review through regular environmental auditing and site inspections during the construction phase. This will confirm the efficacy and implementation of all mitigation measures and commitments identified in the application documentation. Please see Chapter 4 Description and Appendix 4-3 CEMP for details.

Civil disorder at large events

Major crowd safety and civil disorder are not relevant to the Proposed Project. Access to the Proposed Project will be to authorised personnel and local landowners only during the construction, and decommissioning phases. Access to the Proposed Project will be to authorised personnel and the public.

Adverse weather conditions

Potential impacts that may occur on the identified road networks could be caused by an accident during the delivery of the turbines, collisions onsite and offsite with vehicles involved in construction and operation of Proposed Project, and damage to critical transport infrastructure caused by extreme weather i.e., periods of heavy rainfall, taking into account climate change and strong winds

As detailed in Section 15.1 Traffic and Transport in Chapter 15 of this EIAR: Material Assets, the localised traffic disruptions as a result of other proposed works will be mitigated through the use of industry standard traffic management measures. These traffic management measures will be designed in accordance with the Department of Transport's '*Guidance for the Control and Management of Traffic at Roadworks – Second Edition (2010)*'.

16.4 Risk Assessment

This section outlines the possible risks associated with the Proposed Project for the construction, operational and decommissioning phases.

These risks have been assessed in accordance with the relevant classification as outlined in Table 16-1 and 16-2.

As outlined in Section 16.2.4.2.2, the consequence rating assigned to each potential risk assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster i.e., pre-mitigation.

16.4.1 Likely Significant Effects

16.4.1.1 Do-Nothing Scenario

If the Proposed Project were not to proceed, the existing uses for the Proposed Project site of small-scale agricultural farming practices, turbary harvesting and forestry would continue, and public road corridor, public open space, discontinuous urban fabric and agriculture along the grid connection route.

If the Proposed Project were not to proceed, the opportunity to capture a significant part of Tipperary, Limerick and Ireland’s valuable renewable energy resource would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions.

The opportunity to generate local employment and investment would also be lost. This loss of employment and investment would negatively impact the local economy.

16.4.1.2 Identification of Effects During Construction

A risk register has been developed which contains all potentially relevant risks identified during the construction phase of the Proposed Project. Seven risks specific to the construction of the Proposed Project have been identified and are presented in Table 16-5.

Table 16-5 Risk Register - Construction Phase

Risk ID	Potential Risk	Possible Cause
Potential vulnerability to disaster risks		
A	Critical Infrastructure Emergencies Risk of delivery of turbines and infrastructure to site.	Traffic accident during turbine delivery or extreme weather periods of heavy rainfall, taking into account climate change and strong winds
B	Severe Weather Risk to construction activity on site	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds

C	<p>Flooding</p> <p>Risk of flooding in areas surrounding the Site impacting the construction phase and leading to environmental emissions</p>	<p>Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds</p>
<p>Potential to cause accidents and / or disasters.</p>		
D	<p>Utility emergencies</p> <p>Risk of construction activity along the Proposed Grid Connection underground electrical cabling route</p>	<p>Construction activity along grid and road network impacting on local services and utilities</p>
E	<p>Traffic Incident</p> <p>Collisions onsite and offsite with vehicles involved in construction of Proposed Project</p>	<p>Driver negligence or failure of vehicular operations on site roads.</p> <p>Traffic Management not implemented</p>
F	<p>Contamination</p> <p>Discharge or spillage of fuel, chemical solvents into watercourse or percolated to groundwater.</p> <p>Discharge due to horizontal directional drilling (HDD) frack out on grid connection works area.</p>	<p>Accidental fuel spillage during delivery to site.</p> <p>Failure of fuel storage tank or tanks in plant and machinery and vehicles leading to uncontrolled emissions.</p> <p>Drainage and seepage water resulting from accident during infrastructure excavation;</p> <p>Stockpiled excavated material becoming unstable and providing a point source of exposed sediment;</p> <p>Excavation works during the construction of the Proposed Project which may result in entrainment of sediment from the excavations during construction; and,</p> <p>Frack Out associated with HDD along the Proposed Grid Connection underground electrical cabling route which may result in sediment release to surface water.</p>
G	<p>Fire / Gas Explosion</p>	<p>Equipment or infrastructure failure;</p> <p>Electrical problems; and</p> <p>Employee negligence.</p>

16.4.1.3 Identification of Effect During Operation

Four risks specific to the operation of the Proposed Project have been identified and are presented in Table 16-6.

Table 16-6 Risk Register – Operational Phase

Risk ID	Potential Risk	Possible Cause
Potential vulnerability to disaster risks		
H	Severe Weather Risk to operational activity on site, blade or turbine damage	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.
I	Contamination Discharge or spillage of fuel, chemical solvents, sewage or wastewater into watercourse or percolated to groundwater	A vehicular incident on the public road involving fuel, wastewater or sewage transportation in the operational phase. Spill or leak of oil during operational maintenance.
Potential to cause accidents and / or disasters.		
J	Fire / Gas Explosion	Equipment or infrastructure failure; Electrical problems; and Employee negligence.
K	Collapse / damage to structures	Earthquake, extreme weather events; and Vehicular collisions due to driver negligence on public roads.
L	Traffic Incident Collisions onsite and offsite with vehicles involved in operation of Proposed Project	Driver negligence or failure of vehicular operations on site roads. Traffic Management not implemented

16.4.1.4 Identification of Effect During Decommissioning

Four risks specific to the decommissioning of the Proposed Project have been identified and are presented in Table 16-7.

Table 16-7 Risk Register – Decommissioning Phase

Risk ID	Potential Risk	Possible Cause
Potential vulnerability to disaster risks		
M	Severe Weather Risk to decommissioning activity on Site leading to environmental emissions	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.
N	Flooding of site Risk of flooding in areas surrounding the Site impacting the decommissioning phase and leading to environmental emissions	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.
Potential to cause accidents and / or disasters.		
O	Traffic Incident Collisions onsite and offsite with vehicles involved in construction of Proposed Project	Driver negligence or failure of vehicular operations on site roads. Traffic Management not implemented.
P	Contamination Discharge or spillage of fuel, chemical solvents into watercourse or percolated to groundwater	Accidental fuel spillage during delivery to site. Failure of fuel storage tank or tanks in plant and machinery and vehicles leading to uncontrolled emissions.

These risks have been assessed in accordance with the relevant classification (Refer to Table 16-1 and Table 16-2), and the resulting risk analysis is given in Table 16-7.

The risk register is based upon possible risks associated the Proposed Project. As outlined in Section 16.2.4.2, the consequence rating assigned to each potential risk assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster.

16.4.1.5 Risk Assessment Summary

Table 16-7: Assessment of Likely Significant Effects contains a risk assessment which has been developed and contains all potentially relevant risks identified during the construction, operation and decommissioning phases of the Proposed Project.

16.4.1.6 Assessment of Effect – Summary

Table 16-8 Risk Assessment

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
Construction Phase								
A	Critical Infrastructure Emergencies	Extreme weather-periods of heavy rainfall, taking into account climate change and strong winds	Illness or loss of life;	1	The risk of traffic accident during turbine delivery and severe weather conditions impacting the identified road network is unlikely when considering the assessment in Chapter 11 Climate (weather conditions recorded over the last 30 years within the area) and Chapter 15.1 – Traffic Assessment (turbine delivery occurring during the night, Garda patrolled, etc)	1	The risk of a traffic accident due to severe weather conditions during the construction phase will result in a Very Low Impact minor consequence in that ‘Very low disruption to the delivery of services essential for the maintenance of vital societal functions or economic activities’ should a severe weather event occur with ‘minor injuries only’.	1
B	Severe Weather	Extreme weather-periods of heavy rainfall,	Illness or loss of life; Damage to, or depletion of	2	The risk of severe weather is unlikely when considering the assessment in Chapter 11 and weather	1	The risk of severe weather conditions during the construction phase will result in a Very Low Impact in that a ‘ <i>very low disruption to the delivery of services essential for the maintenance of vital societal functions or</i>	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		taking into account climate change and strong winds	aquatic habitats and species;		<p>conditions recorded over the last 30 years within the area.</p> <p>The works programme for the groundworks part of the construction phase of the Proposed Project will take account of weather forecasts and predicted rainfall in particular and construction will be paused if required.</p>		<p><i>economic activities</i>' should a severe weather event occur, with '<i>minor injuries only</i>'</p> <p>Severe weather may cause increased mobilisation of sediment or '<i>simple localised contamination</i>' which will be controlled via the Proposed Project design and mitigation measures. .</p>	
C	Flooding	Extreme weather-periods of heavy rainfall, taking into account climate change and strong winds	<p>Illness or loss of life;</p> <p>Groundwater Flooding</p> <p>Flooding to surrounding properties</p> <p>Damage to, or depletion of aquatic habitats and species;</p>	2	As outlined in Chapter 9 Water, due to the uneven topography of the wind farm site, and with the implementation of the proposed mitigation measures, flood damage at the Proposed Project site is negligible/none.	1	<p>The risk of flooding during the construction phase will result in a Very Low Impact. There will be a '<i>limited disruption to community</i>' should a severe weather event occur, with '<i>minor injuries only</i>'.</p> <p>Flooding has the potential to cause increased sediment mobilisation however flooding is not anticipated, and should any flooding occur, it would be localised.</p>	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
D	Utility emergencies	Construction activity along road network during grid connection installation impacting on local services and utilities	Illness or loss of life; Disruption to services	2	Confirmatory surveys will be carried out by the Contractor to ensure that the grid connection is designed to take into consideration any services and utilities with the road network.	1	The risk of impact on utilities and services during the construction phase will result in a Very Low Impact in that there would be ' <i>limited disruption to community</i> '.	2
E	Traffic Incident	Driver negligence or failure of vehicular operations on Site roads (Proposed Project access roads and public road network in which grid connection is proposed).	Injury or loss of life.	3	Construction vehicles, HGVs and staff vehicles will be present within the Site of the Proposed Project during the construction phase. They will access the Site via the public road network and will therefore interact with local road users. As such, it can be determined that there is some 'opportunity, reason or means' for a vehicle collision during	1	A Very Low Impact is predicted for traffic incidents. Having regard to on-site speed limits and vehicular movements, a 'small number of people would be ' <i>Serious injuries less than 1 in 100,000</i> ' should a vehicular collision occur.	3

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		Traffic Management not implemented			the construction of the Proposed Project, 'at some time.' Throughout the construction phase, traffic management measures will be implemented as outlined in the Traffic Management Plan (Appendix 15-2). An unlikely risk is therefore predicted.			
F	Contamination – Fuel storage and handling -General Construction	Fuel spillage during delivery to the Proposed Project Site. Failure of fuel storage tank or tanks in plant and machinery and vehicles.	Release of suspended solids to groundwater. Contamination of local drinking water supplies and groundwater aquifers. Groundwater and surface water emissions from construction	2	As outlined in Chapter 4, fuel will be stored on-the Proposed Project site but in a bunded area to ensure containment and prevent spillages of fuel. No fuels, chemicals or solvents will be stored outside of the confines of the Proposed Project. Setback distances from sensitive hydrological features means that adequate room is maintained for the proposed drainage	2	The risk of a fuel spillage at the Site causing a significant environmental effect is a Low Impact taking all and best practice measures proposed into account. There would be <i>'Simple, regional contamination, effects of short duration'</i> The grid connection route is located in the existing road network which is of low value environmental receptor. HDD is planned for a limited number of locations and will be controlled to prevent significant environmental effects should frack out occur.	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		<p>Drainage and seepage water resulting from infrastructure excavation;</p> <p>Stockpiled excavated material providing a point source of exposed sediment;</p> <p>Works during the construction of the Proposed Project which may result in entrainment of sediment</p>	<p>activities including trench excavations and HDD (frack out)</p>		<p>mitigation measures as detailed in Chapter 9.</p> <p>Detailed mitigation measures and methodologies for the control of emissions from grid connection works as described in the EIAR. Standard and specific mitigation to prevent accidents and indirect effects of accidents are included in the Proposed Project design and will be implemented.</p>		<p>The potential residual environmental effects are described in detail in Chapter 8 which concludes that there will be no significant environmental effects.</p>	

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		from the excavations or HDD locations;						
G	Fire / Explosion	Equipment or infrastructure failure; Fuel spillage/storage Electrical problems; and Employee negligence	Illness or loss of life; Damage to, or depletion of habitats and species; and Impacts on ambient air quality.	2	As outlined in Chapter 4, fuel will not be stored on-site post construction therefore fuel is not considered to be a significant fire risk. In accordance with Chapter 19 of the Safety, Health and Welfare at Work Act 2005 (the 2005 Act), the development shall be subject to a fire safety risk assessment which would assist in the identification of any major risks of fire on site, and mitigation of the same during operation.	2	Should a fire/explosion occur at the Site, a Low Impact would apply in that there would be ' <i>Community functioning with considerable inconvenience</i> ' due to the nature of the Proposed Project and the lack of infrastructure or fuel storage during operation that would result in any such incident. The co-ordination systems as well as the response elements detailed in the Tipperary County Council and Limerick City and County Council Major Emergency Plans will work to reduce the impact (both on people and the environment) of potential fire/explosions at the Proposed Project.	4
Operational Phase								
H	Severe Weather	Extreme weather-	Illness or loss of life;	2	The risk of severe weather is unlikely when	1	The risk of severe weather conditions during the operational phase will result in a Very	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		periods of heavy rainfall, taking into account climate change and strong winds			considering the assessment in Chapter 11 and weather conditions recorded over the last 30 years within the area.		Low Impact in that a ‘ <i>Serious injuries less than 1 in 100,00</i> ’ would occur should a severe weather event occur.	
I	Contamination	A vehicular incident on the public road or Proposed Project road network involving fuel, firewater, wastewater or sewage transportation in the operational phase.	Damage to, or depletion of aquatic habitats and species Contamination of local drinking water supplies and groundwater aquifers.	2	As outlined in Chapter 4, fuel will be stored on-the Proposed Project site but in a bunded area to ensure containment and prevent spillages of fuel. No fuels, chemicals or solvents will be stored outside of the confines of the Site.	1	The risk of a fuel spillage, contaminated firewater or impact on surrounding drainage during the operational stage will result in a Very Low Impact in that there would be ‘Simple localised contamination’ with ‘Limited disruption to community’, through the use of bunded containment areas and a firewater tank during operation. The potential residual environmental effects are described in detail in Chapter 9 which concludes that there will be no significant environmental effects.	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
J	Fire / Explosion	Equipment or infrastructure failure; Fuel spillage/storage Electrical problems; and Employee negligence	Illness or loss of life; Damage to, or depletion of habitats and species; and Impacts on ambient air quality.	2	As outlined in Chapter 4, fuel will not be stored on-site post construction therefore fuel is not considered to be a significant fire risk. In accordance with Chapter 19 of the Safety, Health and Welfare at Work Act 2005 (the 2005 Act), the Proposed Project shall be subject to a fire safety risk assessment which would assist in the identification of any major risks of fire on site, and mitigation of the same during operation.	2	Should a fire/explosion occur at the Site, there would be a Low Impact in that there would be ‘ <i>Community functioning with considerable inconvenience</i> ’ due to the nature of the Proposed Project and the lack of infrastructure or fuel storage during operation that would result in any such incident. The co-ordination systems as well as the response elements detailed in the Tipperary County Council and Limerick City and County Council - Major Emergency Plans will work to reduce the consequence (both on people and the environment) of potential fire/explosions at the Site. As modern turbine blades are composite structures, the risk of injury arising from the malfunction of a turbine is low. Additionally, all turbines are located in excess of 500m from the nearest dwellings, again minimising the risk of injury and threat to human life.	4
K	Collapse / damage to	Earthquakes, extreme weather events; and	Injury or loss of life.	1	According to the Irish National Seismic Network (INSN), earthquakes measuring ~2 on the Richter Scale	1	The risk of infrastructure collapse during the operational phase will result in a Very Low Impact in that there would be ‘ <i>Serious injuries less than 1 in 100,000</i> ’ and no real	1

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
	structures	Vehicular collisions due to driver negligence on public roads.			<p>are “normal” in terms of seismicity in Ireland. These are known as microearthquakes; they are not commonly felt by people and are generally recorded only on local seismographs. As such, buildings in Ireland are extremely unlikely to be damaged or collapse due to seismic activity.</p> <p>Having regard to public speed limits within the Proposed Project, it is not predicted that any collision of vehicles and any infrastructure would result in considerable damage/collapse.</p>		likelihood of any impact on any environmental receptors.	
L	Traffic Incident	Driver negligence or failure of vehicular operations on Proposed	Injury or loss of life.	3	Construction vehicles, HGVs and staff vehicles will be present within the Site of the Proposed Project during the construction phase. They will access the Site via	1	A Very Low Impact is predicted. Having regard to on-site speed limits and vehicular movements, there would be ‘ <i>Serious injuries less than 1 in 100,000</i> ’ should a vehicular collision occur.	3

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		<p>Project roads.</p> <p>Traffic Management not implemented</p>			<p>the public road network and will therefore interact with local road users.</p> <p>As such, it can be determined that there is some 'opportunity, reason or means' for a vehicle collision during the construction of the Proposed Project, 'at some time.' Throughout the construction phase, traffic management measures will be implemented as outlined in the Traffic Management Plan (Appendix 15-2). An unlikely risk is therefore predicted.</p>			

Decommissioning Phase								
M	Severe Weather	Extreme weather-periods of heavy rainfall, taking into account climate change and strong winds	Illness or loss of life; Damage to, or depletion of aquatic habitats and species;	2	The risk of severe weather is unlikely when considering the assessment in Chapter 11 and weather conditions recorded over the last 30 years within the area. Decommissioning works will be paused should a Status Red weather warning alert be issued by Met Eireann as is standard practice	1	The risk of severe weather conditions during the decommissioning phase will result in a Very Low Impact in that a ' <i>Limited disruption to community</i> ' should a severe weather event occur, with ' <i>Minor injuries only</i> ' Decommissioning will not require significant excavations works. There is no real likelihood of any impact on any environmental receptors	2
N	Flooding	Extreme weather-periods of heavy rainfall, taking into account climate change and strong winds	Illness or loss of life; Groundwater Flooding Flooding to surrounding properties Damage to, or depletion of	2	As outlined in Chapter 9 Water, due to the small scale of the Proposed Project footprint, the naturally high runoff rates and with the implementation of the proposed mitigation measures, the increased flood risk associated with	1	The risk of flooding during the decommissioning phase will result in a Very Low Impact in that a ' <i>Limited disruption to community</i> ' should a severe weather event occur, with ' <i>minor injuries only</i> '.	2

			aquatic habitats and species;		the Proposed Project is negligible/none.			
O	Traffic Incident	<p>Driver negligence or failure of vehicular operations on site roads.</p> <p>Traffic Management not implemented</p>	Injury or loss of life.	3	<p>A limited number of vehicles will be permitted on the Proposed Project as part of the decommissioning phase</p> <p>As such, it can be determined that there is some 'opportunity, reason or means' for a vehicle collision to occur on site, 'at some time.' An unlikely risk is therefore predicted.</p>	1	<p>A Very Low Impact is predicted. Having regard to on-site speed limits and vehicular movements, a '<i>serious injuries less than 1 in 100,00</i>' should a vehicular collision occur.'</p>	3
P	Contamination	<p>Fuel spillage during delivery to site.</p> <p>Failure of fuel storage tank or tanks in plant and machinery and vehicles.</p>	<p>Damage to, or depletion of aquatic habitats and species</p> <p>Discharge to groundwater</p>	2	<p>As outlined in Chapter 4, fuel will be stored on-the Proposed Project but in a bunded area to ensure containment and prevent spillages of fuel. No fuels, chemicals or solvents will be stored outside</p>	2	<p>The risk of a fuel spillage or impact on surrounding drainage during the decommissioning stage will result in a Low Impact in that there would be '<i>Simple, regional contamination, effects of short duration</i>' with 'localised effects of short duration' through the use of bunded containment areas during decommissioning. The potential residual</p>	4

					of the confines of the Proposed Project. Setback distances from sensitive hydrological features means that adequate room is maintained for the proposed drainage measures as detailed in Chapter 9		environmental effects are described in detail in Chapter 9 which concludes that there will be no significant environmental effects.	
Q	Fire / Explosion	Equipment or infrastructure failure; Fuel spillage/storage; Electrical problems; and Employee negligence.	Illness or loss of life; Damage to, or depletion of habitats and species; and Impacts on ambient air quality.	2	There is a possibility of equipment failure during the decommissioning phase of the Proposed Project. In accordance with Chapter 19 of the Safety, Health and Welfare at Work Act 2005 (the 2005 Act), the Proposed Project shall be subject to a fire safety risk assessment which would assist in the identification of any major risks of fire on site, and mitigation of the same during operation.	2	Should a fire/explosion occur at the Site there would be a Low Impact in that there would be ‘ <i>Community functioning with considerable inconvenience</i> ’ due to the nature of the Proposed Project and the lack of infrastructure or fuel storage during operation that would result in any such incident. The co-ordination systems as well as the response elements detailed in the Tipperary County Council and Limerick City and County Council – Major Emergency Plans work to reduce the consequence (both on people and the environment) of potential fire/explosions at the Site.	4

The risk assessment for each of the potential risks identified are consolidated in Table 16-8 which provides their ‘risk score.’ A corresponding risk matrix is provided in Table 16-9, which is colour coded in order to provide an indication of the critical nature of each risk. As outlined in Section 16.2.4.2, the red zone represents ‘high risk’ scenarios’, the amber zone represents ‘medium risk scenarios’ and the green zone represents ‘low risk scenarios’.

Table 16-9 Risk Scores

Risk ID	Potential Risk	Likelihood Rating	Impact Rating	Risk Score
Construction Phase				
A	Critical Infrastructure Emergencies	1	1	1
B	Severe Weather	2	1	2
C	Flooding	2	1	2
D	Utility company emergencies	2	1	2
E	Traffic Incident	3	1	3
F	Contamination	2	2	4
G	Fire / Explosion	2	2	4
Operational Phase				
H	Severe Weather	2	1	2
I	Contamination	2	1	2
J	Fire / Explosion	2	2	4
K	Collapse/ damage to structures	1	1	1
L	Traffic Incident	3	1	3
Decommissioning Phase				
M	Severe Weather	2	1	2
N	Flooding	2	1	2
O	Traffic Incident	3	1	3
P	Contamination	2	2	4
Q	Fire/Explosion	2	2	4

Table 16-10 Risk Matrix

		Consequence Rating				
		1.Minor	2.Limited	3. Serious	4.Very Serious	5.Catastrophic
Likelihood Rating	5.Very Likely					
	4. Likely					
	3. Unlikely	E,L,O				
	2. Very Unlikely	B,C,D,H,I,M,N	F,G,J,P,Q			
	1. Extremely Unlikely	A,K				

Table 16-10 presents the potential risks identified during the construction, operation and decommissioning of the Proposed Project all of which can be classified as ‘low risk’ scenarios. On this basis none of the assessed risks have the potential to have a significant effect on the environment. Therefore, the overall effect is **Not Significant**.

The scenario with the highest risk score (risk scores of 4 or higher) in terms of a major accident and/or natural disaster during the construction, operation and decommissioning phase of the Proposed Project is identified below. It should be noted specific mitigation measures are proposed for the lower risk score scenarios (risk score of 3 or below) and are described in detail in their relevant chapters.

16.4.1.7 Contamination During Construction, Operation and Decommissioning

There is a potential risk of contamination from site activities during the construction, operational and decommissioning phases from potential release of hydrocarbons. The risk of contamination was given a risk score of 4 on a very precautionary basis. However, as outlined in Chapter 9, Section 9.5, measures will be put in place to reduce the risk of accidental spillage and contamination of pollution risk to groundwater, surface water and associated ecosystems, and to terrestrial ecology.

The risk of contamination is ‘very unlikely’ to occur and will have Low Impact when considering the RWCS, representing a ‘low-risk scenario’ during the construction and decommissioning phases.

The conclusions in the relevant chapters of the EIAR conclude that there will be no significant residual effects associated with this potential impact.

16.4.1.8 Fire/Explosion During Construction, Operation and Decommissioning

There is a potential risk of fire/explosion at the Proposed Project site. However, as outlined in Section 16.2.1, the scope of this assessment has been based on the understanding that the Proposed Project will be designed, built and operated in line with current best practice. Further, in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2014, the Proposed Project shall be subject

to a fire safety risk assessment, which will assist in the identification of any major risks of fire on Site, and mitigation of the same during operation.

16.4.2 Mitigation Measures

As outlined in Section 16.4.1, the scenario with the highest risk score in terms of the occurrence of major accident and/or disaster during construction was identified as ‘Contamination’ of the Proposed Project site and risk of ‘Fire/Explosion’ during operation.

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

16.4.2.1 Mitigation – Contamination During Construction, Operation and Decommissioning

Potential effects associated with contamination during construction, operation and decommissioning are addressed fully in Chapter 9 Hydrology. The mitigation measures outlined in Chapter 9 to protect environmental receptors as well as the procedures and measures described in the Construction and Environmental Management Plan (CEMP) will ensure that the risk from these sources is low.

A CEMP has been prepared for the Proposed Project and is included in Appendix 4-3 of this EIAR. Upon a grant of planning permission for the Proposed Project, the CEMP will be updated prior to the commencement of the development. The CEMP will be a live document maintained by the contractor that will work to ensure that potential risks of major accident and/or disaster are identified, avoided and mitigated, as necessary. Refer to Appendix 4-3 for the CEMP that sets out the minimum standards to be employed by the contractor.

16.4.2.2 Mitigation – Fire/Explosion During Operation

The Proposed Project will also be subject to a fire safety risk assessment in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2014, which will assist in the identification of any major risks of fire on site, and mitigation of the same during operation.

The Proposed Battery Energy Storage System will be subject to the Fire Risk Management and Emergency Response Plan, included in Appendix 4-4, which outlines the mitigation design, procedures and actions to protect lives and safety of site personnel and the emergency service personnel, to protect the environment, to minimize damage and disruption, and to ensure a swift return to normal operations following a critical emergency.

As outlined in Section 4.3 of the EIAR, a detailed CEMP will be prepared prior to the commencement of any works. The CEMP will be a live document maintained by the contractor that will work to ensure that potential risks of major accident and/or disaster are identified, avoided and mitigated, as necessary. Refer to Appendix 4-3 for the CEMP that sets out the minimum standards to be employed by the contractor.

16.4.3 Residual Effects

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*’ (DoEHLG, 2024).

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

16.4.4 Monitoring

16.4.4.1 Monitoring During Construction

As outlined in Section 4.3 of the EIAR, a detailed CEMP will be prepared prior to the commencement of any works. The CEMP will be a live document maintained by the contractor that will work to ensure that potential risks of major accident and/or disaster are identified, avoided and mitigated, as necessary. Refer to Appendix 4-3 for the CEMP that sets out the minimum standards to be employed by the contractor.

16.4.4.2 Monitoring During Operation

The operator of the Proposed Project will continue to assess the risk of major accidents and/or disasters on site on an on-going basis during operation.

The maintenance programme, record of reported incidents, as well as general site activities will be monitored on an on-going basis to ensure risk of major accidents does not increase over time.

16.4.4.3 Monitoring During Decommissioning

As outlined in Section 4.11 of the EIAR, a Decommissioning Plan has been prepared (Appendix 4-6) the final detail of which will be agreed with the local authority prior to any decommissioning. The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will be agreed with the competent authority at that time.

16.4.5 Cumulative Impact Assessment

A search in relation to plans and projects that may have the potential to result in a cumulative impact with the Proposed Project on the environment was carried out as part of the EIAR. The Proposed Project has been considered, in combination with existing, permitted and proposed projects and plans (wind energy or otherwise), as set out in Section 2.8 in Chapter 2 of this EIAR.

Following a detailed assessment of the potential for any further impact when considered in combination with any or all of the plans and projects set out in set out in Chapter 2, Section 2.8, the Proposed Project, with mitigation measures in place, was found to have no potential for significant in-combination or cumulative effects associated with the potential for the project to be impacted by major accidents or natural disasters or the Proposed Project potential to cause major accidents or natural disasters. This is based on the low risk associated with the Proposed Project described in this Chapter of the EIAR and a review of the nature of the surrounding land uses and projects existing or intended in the surrounding area.

16.5 EIA Classification Table

Please see the below table for a summary of all identified impacts for the Proposed Project relating to major accidents and natural disasters.

Table 16-11 EIA Classification Table

Topic	Pre-Mitigation Effect	Mitigation Section Reference	Residual Effect	Significance
Construction Phase				
Contamination	Temporary, Moderate, Negative	Section 16.4.1.7	Temporary, Slight, Negative	Not Significant
Major Fire	Temporary, Moderate, Negative	Section 16.4.1.8	Temporary, Slight, Negative	Not Significant
Operational Phase				
Contamination	Temporary, Moderate, Negative	Section 16.4.1.7	Temporary, Slight, Negative	Not Significant
Major Fire	Temporary, Moderate, Negative	Section 16.4.1.8	Temporary, Slight, Negative	Not Significant
Decommissioning Phase				
Contamination	Temporary, Moderate, Negative	Section 16.4.1.7	Temporary, Slight, Negative	Not Significant
Major Fire	Temporary, Moderate, Negative	Section 16.4.1.8	Temporary, Slight, Negative	Not Significant