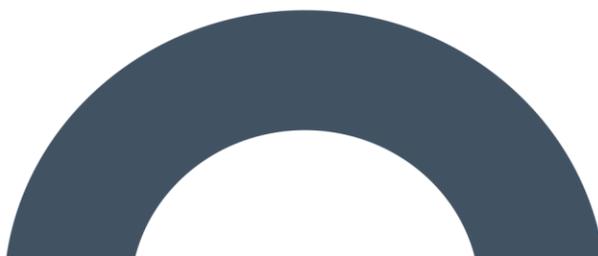


Environmental Impact Assessment Report

Proposed Clonberne Wind
Farm Development, Co.
Galway

Chapter 16 – Major Accidents and
Natural Disasters





DOCUMENT DETAILS

Client: **Clonberne Windfarm Limited**

Project Title: **Proposed Clonberne Wind Farm Development, Co. Galway**

Project Number: **180740**

Document Title: **Environmental Impact Assessment Report**

Document File Name: **Ch 16. Major Accidents and Natural Disasters F - 2024.06.20 - 180740**

Prepared By: **MKO
Tuam Road
Galway
Ireland
H91 VW84**



Rev	Status	Date	Author(s)	Approved By
01	Final	20/06/2024	JS	OC

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 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 (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 those projects.

"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 or could cause;
- 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', 'the Site', 'Proposed Wind Farm' and 'Proposed Grid Connection'.

16.1.1 Statement of Authority

This section of the EIAR has been prepared by Jack Smith and Jonny Fearon and reviewed by Owen Cahill, all of MKO. The Statement of Authority for Jack, Jonny and Owen are detailed in Section 1.8.2.1 in Chapter 1 of this EIAR.

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
- Regional Planning Guidelines for the West Region (2010 – 2022)
- Regional Spatial and Economic Strategy (RSES) Northern and Western Regional Assembly 2020 – 2032
- Galway County Development Plan (2022 – 2028)
- Galway County Council Major Emergency Plan (2021),
- Galway 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 or indirectly. These include accidents during construction, operation and decommissioning of the Proposed Project caused by operational failure and/or natural hazards. The assessment of the risk of major accidents and/or disaster is considered in relation to the information required to be provided in the EIAR, i.e. population and human health, biodiversity, land, soil, water, air, climate and material assets, cultural heritage and the landscape.

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 (2014/52/EU):

- The vulnerability of the Proposed Project to potential accidents and disasters
- The Proposed Project 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 Section 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 following guidance documents have been consulted in the preparation of this section:

- 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*
- Environmental Protection Agency (2014) Guidance on Assessing and Costing Environmental Liabilities
- Department of Defence (2020) A National Risk Assessment for Ireland
- Health Service Authority advice for Health and Safety in the Renewable Sector.¹
- Rialtas na hÉireann 2021-2022 National Risk Assessment: Overview of Strategic Risks²
- Galway County Emergency Plan 2021

On a regional scale, Galway falls under the scope of the Western Major Emergency Plan (MEM)³.

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 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 (Proposed Wind Farm Site and Proposed Grid Connection). 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

¹ Health Service Authority advice for Health and Safety in the Renewable Sector
https://www.hsa.ie/eng/your_industry/renewable_energy/

² Rialtas na hÉireann 2021-2022 National Risk Assessment: Overview of Strategic Risks.

<https://www.gov.ie/pdf/?file=https://assets.gov.ie/220847/1291534a-9b27-4c05-92ed-d3bd21adc89a.pdf#page=null>

³ HSE Emergency Management Area 2 Crisis Management Team Major Emergency Plan (Covering Geographical Areas of Counties Galway, Mayo and Roscommon) July 2023

Dangerous Substances Regulations i.e. SEVESO sites and so there are no potential effects from this source.

The Proposed Project has low potential to cause natural disasters or major accidents. As detailed in Section 8.3.3 in Chapter 8 of this EIAR, the published soil map (www.epa.ie) for the area shows that Wind Farm site is predominantly covered by cutaway/cutover peat and peaty poorly drained mineral soil (BminPDPT) along with some localised deep well drained mineral soil (BminDW). Geomorphologically, the peat at the Site is raised bog, also known as basin peat.

The majority of the grassland and forestry areas within the Proposed Wind Farm site are mapped to have BminPDPT soil. Deep well drained mineral soils are limited to a small area on the north-east of the Wind Farm site, which comprises grassland.

The GSI subsoils map (www.gsi.ie) also shows that the Proposed Wind Farm site has a large coverage of cutover raised peat (67%) which in turn is surrounded predominately by limestone tills (30%). An isolated pocket of limestone gravels is mapped in the central area of the Wind Farm site and also at the area of the proposed borrow pit (3%). The GSI mapped cutover bogs areas also includes areas of grasslands which suggests these grassland areas are improved/reclaimed.

Based on the GSI subsoils mapping, proposed turbine locations T2 and T9 are located on limestone tills and the other no. 9 proposed turbines are located on cutover raised peat. All proposed 4 no. peat repositories and the 1 no. spoil deposition area are also located on cutover raised peat.

With regard the Proposed Grid Connection, the proposed substation is mapped to be underlain by limestone tills including the section of grid cable along public roads and 2 no. end masts. The section of grid cable within the Wind Farm site is mapped mainly as cutover raised peat. 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 in the relevant EIAR assessment chapters (refer to Chapters 5-15 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 EPA 'Guidance on Assessing and Costing Environmental Liabilities' 2014 document. The following steps were taken as part of the site specific risk assessment:

- Risk Identification
- Risk Classification, likelihood and consequence, 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. The identification of risks has focussed on non-standard but plausible incidents that could occur at the Proposed Project during construction, operation and decommissioning.

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

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

16.2.4.2.2 Risk Classification

Classification of Likelihood

After identifying the potential risks, 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, 2010)

Ranking	Likelihood	Description
1	Extremely Unlikely	May occur only in exceptional circumstances; once every 500 or more years.
2	Very Unlikely	Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities, or communities; and / or little opportunity, reason or means to occur; may occur once every 100-500 years.
3	Unlikely	May occur at some time; and /or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisation's worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years.
5	Very Likely	Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.

Classification of Consequence

The consequence 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 Galway County Major Emergency Plan will work to reduce the consequences of any major accident or disaster. The consequence of the impact if the event occurs has been assigned as described in Table 16-2.

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, 2010)

Ranking	Likelihood	Impact	Description
1	Minor	Life, Health, Welfare Environment Infrastructure Social	Small number of people affected; no fatalities and small number of minor injuries with first aid treatment. No contamination, localised effects <€0.5M Minor localised disruption to community services or infrastructure (<6 hours).
2	Limited	Life, Health, Welfare Environment Infrastructure Social	Single fatality; limited number of people affected; a few serious injuries with hospitalisation and medical treatment required. Localised displacement of a small number of people for 6-24 hours. Personal support satisfied through local arrangements. Simple contamination, localised effects of short duration €0.5-3M Normal community functioning with some inconvenience.
3	Serious	Life, Health, Welfare Environment Infrastructure Social	Significant number of people in affected area impacted with multiple fatalities (<5), multiple serious or extensive injuries (20), significant hospitalisation. Large number of people displaced for 6-24 hours or possibly beyond; up to 500 evacuated. External resources required for personal support. Simple contamination, widespread effects or extended duration €3-10M Community only partially functioning, some services available.
4	Very Serious	Life, Health, Welfare Environment Infrastructure Social	5 to 50 fatalities, up to 100 serious injuries, up to 2000 evacuated Heavy contamination, localised effects or extended duration €10-25M

Ranking	Likelihood	Impact	Description
			Community functioning poorly, minimal services available
5	Catastrophic	Life, Health, Welfare Environment Infrastructure Social	Large numbers of people impacted with significant numbers of fatalities (>50), injuries in the hundreds, more than 2000 evacuated. Very heavy contamination, widespread effects of extended duration. >€25M Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support.

Risk Evaluation

Once classified, the likelihood and consequence ratings have been multiplied to establish a ‘risk-score’ to support the evaluation of risks by means of a risk matrix.

The risk matrix sourced from the DoEHLG *Guide Assessment in Major Emergency Management* and as outlined in Table 16-3 indicates the critical nature of each risk. The risk matrix has therefore been applied to evaluate each of the risks associated with the Proposed Project. The risk matrix 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 Classification of Impact (Source: DoEHLG, 2010)

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

Baseline Conditions

The functional area of Galway County Council fall under the West Major Emergency Region. The Major Emergency Plan prepared by Galway County Council (2021)⁴ outlines the following potential major emergency scenarios in the county:

- Transport Emergencies:
 - M6, M17, M18 Motorways
 - National Primary Routes N6, N17 & N18
 - Iarnród Éireann: Galway – Athlone, Galway – Ennis Rail Lines
 - Airports including Island Airports
 - Galway Harbour
 - Ros an Mhíl Harbour
 - Offshore Inhabited Island and Ferries
- Natural Emergencies:
 - Flooding
 - Severe Weather
 - Landslide/ Tsunami
- Technological Emergencies
 - COMAH Sites
 - Large Fires/Lakes
 - Hazardous Materials Incidents
 - Environmental Pollution
- Civil Emergencies:
 - Terrorism
 - Large Crowd Events
 - Loss of Critical Infrastructure
 - Pollution of Water Supplies
 - Communicable Diseases/ Public Health Emergencies
- Utility Company Emergencies
 - Bord Gáis Networks
 - E.S.B. Networks
- Site/Event Specific Internal Emergency Plans
 - Galway Harbour Major Emergency Incident Plan (GFRS)
 - Island Response Major Incident Plan (GFRS)
 - M6, M17 & M18 Motorway Plans (GFRS)
 - Severe Weather (Excluding Flood Events) Plan
 - Flood Response Plan
 - Mortality Management Plan
 - Marine and Inland Pollution Plans
 - GCC Business Continuity Plan
- Site/Event Specific External Emergency Plans
 - Circle K Oil Terminal, Galway Harbour
 - Colas Bitumen Emulsion West, Oranmore
 - Inter-Agency Island Response Plan
 - Inter-Agency Plan for Galway Racecourse
 - Tynagh Energy, Tynagh
 - Galway Harbour – GALFIRE
 - Ros an Mhíl Harbour Plan
 - Coillte Forestry Emergency Plans.

The risks which are most relevant to this assessment are described below:

⁴ <https://www.galway.ie/en/media/GCC%20MEP%20Revised%202021%2013%20Jan%202021.pdf>

Transport Emergencies

As detailed in Chapter 15: Material Assets, the Proposed Project will utilise both the N17 National Road, N83 National Road and Galway Harbour in order to facilitate construction. There is a detailed Traffic and Transport assessment included in Chapter 15 of this EIAR which details exactly how both the Harbour and the National Primary Route will be utilised.

Natural Emergencies

Chapter 9 Hydrology of this EIAR provides detailed assessment regarding the susceptibility of the Proposed Project to flooding and landslide events. A Flood Risk Assessment was undertaken for the Proposed Project to identify the existing potential flood risks associated with the Site. Identifiable map text on local available historical 6" or 25" mapping for the Site area do not identify any lands that are "liable to flood".

There is no OPW River Flood Extents Mapping available for the area of the Site and therefore the National Indicative Fluvial Mapping (NIFM) was consulted which has estimated current and future scenario 100-year and 1000-year fluvial flood zones for the Levally Stream at the location of the Site.

Based on the National Indicative Fluvial Mapping (NIFM), the 100-year and 1000-year flood zones of Stream A (tributary of Levally Stream) extends into localised low-lying cutaway bog areas mainly in the central area of the Wind Farm site. The most extensive mapped fluvial flooding occurs along Stream A between proposed turbine locations T6 and T7 within the bog. The flooding on the grasslands on the north of the Wind Farm just affects localised areas close to the watercourse channel.

These flood zone constraints were considered during the early stages of the Wind Farm site layout design and therefore no turbines or associated hardstand areas are located inside an NIFM flood zones.

However, watercourse crossings were unavoidable and along this stretch of Stream A there are 2 no. existing bridge/culvert crossings on Stream A associated with bog roads that will be utilised by the Proposed Project. Approximately 0.26km of existing bog roads (proposed for upgrade as part of the Proposed Project) are also located within mapped 1000-year fluvial flood zone.

Also located within 1000-year mapped fluvial flood zone in this same general area is approximately 100m of proposed access road and 1 no. proposed watercourse on Stream A that will allow access to proposed turbine location T6.

Further upstream there is 1 no. proposed watercourse crossing near proposed turbine T2 and 1 no. existing crossing for upgrade at T5 where the proposed access roads will encroach mapped 1000-year fluvial flood zones. The proposed total length of this new access roads only amounts to 110m.

The GSI Groundwater Flood Maps and Winter 2015/2016 Surface Water Flooding Maps have no flood zones mapped within the Site.

All potential vulnerable Proposed Project infrastructure, including all 11 no. turbines, the substation, end masts, construction compounds, peat repositories, spoil storage area and borrow pit are located above the mapped 1000-year flood level and therefore all this infrastructure is located in Flood Zone C (Low Risk).

Gavin and Doherty Geosolutions (GDG) were engaged to undertake a Peat Stability Risk Assessment of the Proposed Project site. A Peat Stability Risk Assessment Report (GDG, 2024) is attached as Appendix 8-1.

Based on the available data, the fieldwork, and GDG's professional judgement, it is concluded that significant peat slides are unlikely on the site with diligent peat management and careful consideration of the peat conditions at the site at the design and construction stage.

A deterministic Factor of Safety was calculated across the proposed element locations, and from this, a robust peat stability risk assessment (PSRA) was performed. The findings of the peat assessment showed that the site has an acceptable margin of safety and is suitable for the Proposed Project, provided appropriate mitigation measures, as outlined in the Peat Stability Risk Assessment in Appendix 8-1.

The peat stability risk for the proposed infrastructure is negligible. However, the results of the factor of safety deterministic calculation and the site walkover allowed for the identification of safety buffer areas outlined in Section 4.6 and shown in Appendix L in the Peat Stability Risk Assessment report in Appendix 8-1.

Technological Emergencies

The nearest SEVESO site to the Proposed Project site is the Colas Bitumen Emulsion (West) Ltd, located in Oranmore, Co. Galway. This facility is located approximately 34km southwest of the Proposed Project, therefore, the probability of this major emergency having an effect on the Proposed Project, whether during the construction, operational or decommissioning phase, is low.

Civil Emergencies

The likelihood of a civil emergency, as described above, occurring at the Site is anticipated to be low. During construction of the infrastructure associated with the Wind Farm Site, there is a possible risk of contamination of drinking water supplies in the absence of mitigation. Chapter 9 of this EIAR has put forward detailed mitigation measures which, once implemented, will ensure that no negative impact to surface or ground water quality occurs.

Utility Company Emergencies

The likelihood of a utility company emergency, as described above, occurring at the Site is considered to be low. There is no Bord Gáis Networks infrastructure present on the Site and so the possibility of disturbance to this type of infrastructure is deemed to be low.

The ESB network supplies homes and business in Ireland. 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.

There may be ESB Network services located within the public road in which the underground cable forming part of the Grid Connection is located. As outlined in Section 4.6, prior to works commencing, surveying will take place along the proposed cable route, and ESB Networks will be contacted and all drawings for all existing services sought. Any underground services encountered along the cable routes will be surveyed for level and the ducting will pass over the service provided adequate cover is available. Given the measures outlined in Chapter 4 in relation these services, the possibility of disturbance to this type of infrastructure is deemed to be low.

Site/Event Specific Internal Emergency Plans

It is proposed that all turbine components to be used for the construction of the Proposed Wind Farm site will be delivered from Galway Harbour. Due to the fact that Galway Harbour is being utilised to facilitate the construction of the Wind Farm Site, there is potential for a Site/Event Specific Internal Emergency Plan to be utilised during this process. It is considered, however, that the likelihood of this occurring is low.

There is also the possibility that the Severe Weather Plan may need to be implemented during the construction, operational and/or decommissioning phase of the Proposed Project due to emerging and forecasted trends in climate change associated weather patterns.

Site/Event Specific External Emergency Plans

As detailed above, it is proposed that all turbine components to be used for the construction of the Proposed Wind Farm Site are to be delivered from Galway Harbour. The Galway Harbour – GALFIRE is in place as a Site/Event Specific External Emergency Plan in case of major emergency associated with the Galway Harbour. There is therefore a possibility that this emergency plan may need to be implemented during the construction phase of the Wind Farm Site. However, the likelihood of this occurring is deemed to be low.

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 classifications 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 Wind Farm of small scale agricultural farming practices and peat extraction would continue, and public road corridor, agriculture and one-off rural housing along the Proposed Grid Connection.

If the Proposed Project were not to proceed, the opportunity to capture a significant part of County Galway's and Ireland's valuable renewable 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. It is likely that the trends of population growth that have been recorded in the Population Study Area, as outlined in Chapter 5, would continue in the absence of investment.

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. Risks specific to the construction of the Proposed Project have been identified and are presented in Table 16-4.

Table 16-4 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	Flooding Risk of flooding in areas surrounding the Site impacting the construction 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.		
D	Utility emergencies Risk of construction activity along the Proposed Grid Connection underground electrical cabling route	Construction activity along grid and road network impacting on local services and utilities
E	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
F	Contamination Discharge or spillage of fuel, chemical solvents into watercourse or percolated to groundwater. Discharge due to horizontal directional drilling (HDD) frack out on the Proposed Grid Connection works area.	Accidental fuel spillage during delivery to site. Failure of fuel storage tank or tanks in plant and machinery and vehicles leading to uncontrolled emissions. Drainage and seepage water resulting from accident during infrastructure excavation;

Risk ID	Potential Risk	Possible Cause
		<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	Fire / Gas Explosion	<p>Equipment or infrastructure failure;</p> <p>Electrical problems; and</p> <p>Employee negligence.</p>

16.4.1.3 Identification of Effect During Operation

Risks specific to the operation of the Proposed Project have been identified and are presented in Table 16-5.

Table 16-5 Risk Register – Operational Phase

Risk ID	Potential Risk	Possible Cause
Potential vulnerability to disaster risks		
H	<p>Severe Weather</p> <p>Risk to operational activity on site, blade or turbine damage</p>	<p>Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.</p>
I	<p>Contamination</p> <p>Discharge or spillage of fuel, chemical solvents, sewage or wastewater into watercourse or percolated to groundwater</p>	<p>A vehicular incident on the public road involving fuel, wastewater or sewage transportation in the operational phase.</p> <p>Spill or leak of oil during operational maintenance.</p>
Potential to cause accidents and / or disasters.		
J	Fire / Gas Explosion	<p>Equipment or infrastructure failure;</p> <p>Electrical problems; and</p> <p>Employee negligence.</p>

Risk ID	Potential Risk	Possible Cause
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

Risks specific to the decommissioning of the Proposed Project have been identified and are presented in Table 16-6.

Table 16-6 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	Accidental fuel spillage during delivery to site.

Risk ID	Potential Risk	Possible Cause
	Discharge or spillage of fuel, chemical solvents into watercourse or percolated to groundwater	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 with the Proposed Project. As outlined in Section 16.2.4.2, the consequences 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 Assessment of Effect - Summary

Table 16-7 Risk Assessment

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence 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 severe weather conditions impacting the identified road network is unlikely when considering the assessment in Chapter 11 (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 minor consequence in that ‘small number of people would be affected’ should a severe weather occur, with ‘no fatalities and a small number of minor injuries with first aid treatment’.	1
B	Severe Weather	Extreme weather-periods of heavy rainfall, taking into account climate change	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.	1	The risk of severe weather conditions during the construction phase will result in a minor consequence in that ‘small number of people would be affected’ should a severe	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
		and strong winds			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, as outlined in the Construction and Environmental Management Plan (CEMP) contained in Appendix 4-4).		weather occur, with 'no fatalities and a small number of minor injuries with first aid treatment'. Severe weather may cause increased mobilisation of sediment which will be controlled via the Proposed Project design and mitigation measures.	
C	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 detailed in Stage II Flood Risk Assessment (FRA) Appendix 9-1, site-specific flood modelling was carried out for the Proposed Project site. No instances of historical flooding were identified in historic OS maps. No instances of recurring or historic flooding were identified on OPW maps within or immediately	1	The risk of flooding during the construction phase will result in a minor consequence in that 'small number of people would be affected' should a severe weather occur, with 'no fatalities and a small number of minor injuries with first aid treatment' Flooding has the potential to cause increased sediment	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
			aquatic habitats and species;		<p>downstream of the Proposed Project site on OPW maps.</p> <p>As detailed in Section 4.3.5 of the FRA in Appendix 9-1, the majority of the Proposed Project site is located in Flood Zone C. It is outlined that infrastructure such as a proposed watercourse crossing, approximately 0.26km of proposed road upgrades and 210m of proposed new access roads are located in Flood Zone A/B.</p>		mobilisation however flooding is not anticipated and should any flooding occur it would be localised.	
D	Utility emergencies	Construction activity along road network during Grid Connection installation impacting on local services and utilities	<p>Illness or loss of life;</p> <p>Disruption to services</p>	2	Confirmatory surveys will be carried out by the Contractor to ensure that the Proposed 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 minor consequence in that 'small number of people would be affected, with 'no fatalities and a small number of minor injuries with first aid treatment'.	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
E	Traffic Incident	<p>Driver negligence or failure of vehicular operations on Site roads (Proposed Wind Farm Site access roads and public road network in which the Proposed Grid Connection is proposed).</p> <p>Traffic Management not implemented</p>	Injury or loss of life.	3	<p>The Traffic and Transport section of Chapter 15: Material Assets of this EIAR details traffic movements which relate to the Construction Phase of the Proposed Project. The Traffic Management Plan included as Appendix 15-1 details proposals for traffic movements entering and leaving the site, and within the internal access roads.</p> <p>The internal road network within the Proposed Wind Farm has been designed to allow for 2 vehicles to pass on the road, and/or in passing bays, which will reduce the likelihood of a traffic incident or collision occurring within the Proposed Wind Farm. There will also be a speed limit imposed on the internal Proposed Project road network, which will also reduce the</p>	1	A minor consequence is predicted. Having regard to on-site speed limits and vehicular movements, a 'small number of people would be affected' should a vehicular collision occur, with 'no fatalities and small number of minor injuries with first aid treatment.'	3

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					<p>likelihood of any traffic incident or collision.</p> <p>As such, it can be determined that there is some 'opportunity, reason or means' for a vehicle collision to occur on the Proposed Project site or public roads, 'at some time.' An unlikely risk is therefore predicted.</p>			
F	<p>Contamination – Fuel storage and handling</p> <p>-General Construction</p>	<p>Fuel spillage during delivery to Site.</p> <p>Failure of fuel storage tank or tanks in plant and machinery and vehicles.</p> <p>Drainage and seepage water resulting from</p>	<p>Release of suspended solids to groundwater.</p> <p>Contamination of local drinking water supplies and groundwater aquifers.</p> <p>Groundwater and surface water emissions from construction activities including trench</p>	2	<p>As outlined in Chapter 4 and Chapter 9, fuel will be stored on-the Wind Farm Site but in a bunded area to ensure containment and prevent spillages of fuel. No fuels, chemicals or solvents will be stored inside the Gurteen/Cloonmore Group Water Scheme area.</p> <p>Setback distances from sensitive hydrological features means that</p>	2	<p>The risk of a fuel spillage or impact on surround drainage during the construction will result in a limited consequence in that there would be 'a limited number of people affected' with 'localised effects of short duration' on environmental receptors through the use of bunded containment areas during construction.</p> <p>The majority of the infrastructure associated</p>	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
		<p>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 from the excavations or HDD locations.</p>	excavations and HDD (frack out).		<p>adequate room is maintained for the proposed drainage mitigation measures as detailed in Chapter 9.</p> <p>Detailed mitigation measures and methodologies for the control of emissions from the Grid Connection works including the potential for Frack Out 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>with the underground cable route is located in the existing road network which is of low value environmental receptor.</p> <p>HDD is planned for a limited number of locations and will be controlled to prevent significant environmental effects should frack out occur.</p> <p>The potential residual environmental effects are described in detail in Chapter 9 which concludes that there will be no significant environmental effects.</p>	
G	Fire / Gas Explosion	Equipment or infrastructure failure;	<p>Illness or loss of life;</p> <p>Damage to, or depletion of</p>	2	As outlined in Chapter 4, fuel will not be stored on-site post construction therefore fuel is not	2	Should a fire/explosion occur at the Site, a limited consequence in that there would be 'a limited number of people affected' with	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
		Fuel spillage/storage Electrical problems; and Employee negligence	habitats and species; and Impacts on ambient air quality.		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.		'localised effects of short duration' on people and environmental receptors 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. There will be 'normal community functioning' in the area with 'some inconvenience' The 'generic command, control & co-ordination systems' as well as the 'common elements of response' detailed in the Galway County Council Major Emergency Plan will work to reduce the consequence (both on people and the environment) of potential fire/explosions at the Site.	
Operational Phase								

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
H	Severe Weather	Extreme weather-periods of heavy rainfall, taking into account climate change and strong winds	Illness or loss of life;	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.	1	The risk of severe weather conditions during the operational phase will result in a minor consequence in that ‘small number of people would be affected’ should a severe weather occur, with ‘no fatalities and a small number of minor injuries with first aid treatment’.	2
I	Contamination	A vehicular incident on the public road or on the Proposed Project road network involving fuel, wastewater or sewage transportation in the operational phase.	Damage to, or depletion of aquatic habitats and species Contamination of local drinking water supplies, Group Water Schemes, and groundwater aquifers.	2	As outlined in Chapter 4 and Chapter 9, fuel will be stored on-the Wind Farm Site but in a bunded area to ensure containment and prevent spillages of fuel. No fuels, chemicals or solvents will be stored inside the Gurteen/Cloonmore Group Water Scheme zone of contribution.	1	The risk of a fuel spillage or impact on surround drainage during the operational stage will result in a limited consequence in that there would be ‘a limited number of people affected’ with ‘localised effects of short duration’ through the use of bunded containment areas during operation. The potential residual environmental effects are described in detail in Chapter 9 which concludes that there will be	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
							no significant environmental effects.	
J	Fire / Gas Explosion	<p>Equipment or infrastructure failure;</p> <p>Fuel spillage/storage</p> <p>Electrical problems; and</p> <p>Employee negligence</p>	<p>Illness or loss of life;</p> <p>Damage to, or depletion of habitats and species; and</p> <p>Impacts on ambient air quality.</p>	2	<p>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.</p> <p>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.</p>	2	Should a fire/explosion occur at the site, a limited consequence in that there would be 'a limited number of people affected' with 'localised effects of short duration' on people and environmental receptors 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. There will be 'normal community functioning' in the area with 'some inconvenience' The 'generic command, control & co-ordination systems' as well as the 'common elements of response' detailed in the Galway County Council Major Emergency Plan will work to reduce the consequence (both on people and the	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
							environment) of potential fire/explosions at the site.	
K	Collapse/ damage to structures	<p>Earthquakes, extreme weather events; and</p> <p>Vehicular collisions due to driver negligence on public roads.</p>	Injury or loss of life.	1	<p>According to the Irish National Seismic Network (INSN), earthquakes measuring ~2 on the Richter Scale 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 Wind Farm Site, it is not predicted that any collision of vehicles and any infrastructure would result in significant damage/collapse.</p>	1	The risk of infrastructure collapse during the operational phase will result in a minor consequence in that ‘small number of people would be affected’ and no real likelihood of any impact on any environmental receptors.	1

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
L	Traffic Incident	Driver negligence or failure of vehicular operations on Proposed Wind Farm Site roads. Traffic Management not implemented	Injury or loss of life.	3	A very low number of vehicles will access the Proposed Wind Farm Site as part of the operational phase. As such, it can be determined that there is some 'opportunity, reason or means' for a vehicle collision to occur on the Wind Farm Site, 'at some time.' An unlikely risk is therefore predicted.	1	A minor consequence is predicted. Having regard to on-site speed limits and vehicular movements, a 'small number of people would be affected' should a vehicular collision occur, with 'no fatalities and small number of minor injuries with first aid treatment.'	3
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	1	The risk of severe weather conditions during the decommissioning phase will result in a minor consequence in that 'small number of people would be affected' should a severe weather occur, with 'no fatalities and a small number of minor injuries with first aid treatment'.	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					warning alert be issued by Met Eireann as is standard practice		Decommissioning will not require significant excavations works. There is no real likelihood of any impact on any environmental receptors	
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 aquatic habitats and species;	2	As detailed in Stage II Flood Risk Assessment (FRA) Appendix 9-1, site-specific flood modelling was carried out for the Proposed Project site. No instances of historical flooding were identified in historic OS maps. No instances of recurring or historic flooding were identified on OPW maps within or immediately downstream of the Proposed Project site on OPW maps. As detailed in Section 4.3.5 of the FRA in Appendix 9-1, the majority of the Proposed Project site is	1	The risk of flooding during the decommissioning phase will result in a minor consequence in that 'small number of people would be affected' should a severe weather occur, with 'no fatalities and a small number of minor injuries with first aid treatment'.	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					located in Flood Zone C. It is outlined that infrastructure such as a proposed watercourse crossing, approximately 0.26km of proposed road upgrades and 210m of proposed new access roads are located in Flood Zone A/B.			
O	Traffic Incident	Driver negligence or failure of vehicular operations on site roads. Traffic Management not implemented	Injury or loss of life.	3	Vehicles will be present within the site of the Proposed Project during the decommissioning phase. They will access the site via the public road network and will therefore interact with local road users. It should be noted that the design of the windfarm should allow for 2 vehicles to pass on the internal roads and/or passing bays - this will reduce the likelihood of collision internally.	1	A minor consequence is predicted. Having regard to on-site speed limits and vehicular movements, a 'small number of people would be affected' should a vehicular collision occur, with 'no fatalities and small number of minor injuries with first aid treatment.'	3

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					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	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 and the Decommissioning Plan in Appendix 4-6, fuel will be stored on-the Wind Farm 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 Wind Farm Site</p> <p>Setback distances from sensitive hydrological features means that adequate room is maintained for the proposed drainage measures as detailed in Chapter 9</p>	2	<p>The risk of a fuel spillage or impact on surrounding drainage during the decommissioning stage will result in a limited consequence in that there would be 'a limited number of people affected' with 'localised effects of short duration' through the use of bunded containment areas during decommissioning. The potential residual environmental effects are described in detail in Chapter 9 which concludes that there will be no significant environmental effects.</p>	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 16-8 Risk Scores

Risk ID	Potential Risk	Likelihood Rating	Consequence 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 / Gas Explosion	2	2	4
Operational Phase				
H	Severe Weather	2	1	2
I	Contamination	2	1	2
J	Fire / Gas 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

Table 16-9 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			
	1. Extremely Unlikely	A, K				

Table 16-9 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.

The scenarios with the highest risk score in terms of a major accident and/or natural disaster during the construction, operation and decommissioning phase of the Proposed Project is identified below.

16.4.1.6 Contamination During Construction and Decommissioning

There is a potential risk of contamination from site activities during the construction 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 ‘limited’ consequences should it do so, representing a ‘low-risk scenario’ during the construction and decommissioning phases.

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

16.4.1.7 Fire/Explosion During Construction and Operation

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 the Site, and mitigation of the same during operation.

16.4.2 Mitigation Measures

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

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

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 4-4 of this EIAR. Upon a grant of planning permission for the Proposed Project, the CEMP will be updated to reflect the conditions stipulated in the consent 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 4-4 for the CEMP that sets out the minimum standards to be employed by the contractor.

16.4.2.2 Mitigation – Fire/Explosion During Construction and 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.

As outlined in Section 4.3.4 of the EIAR, the Construction Environmental Management Plan (CEMP) will be reviewed and updated 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 4-4 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 ‘*Guide to Risk Assessment in Major Emergency Management*’ (DoEHLG, 2010).

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

16.4.4 Monitoring

16.4.4.1 Monitoring During Construction

As outlined in Section 4.3.4 of the EIAR, the Construction Environmental Management Plan (CEMP) will be reviewed and updated 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 4-4 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 4.9 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 finalised with the competent authority at that time.

16.4.5 **Impacts of Cumulative and In Combination Impacts**

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 Projects 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.