18. MAJOR ACCIDENTS AND DISASTERS

18.1 INTRODUCTION

This chapter assesses the likely significant negative effects of the proposed project deriving from its vulnerability to risk of Major Accidents and/or Natural Disasters, as well as the likelihood of the proposed project itself to cause potential Major Accidents and/or Natural Disasters during the construction, operation and decommissioning phases.

The assessment of vulnerability of the proposed project to major accidents and natural disasters, as well as the likelihood of the proposed project itself to cause potential major accidents and/or natural disasters is carried out in compliance with the European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU)(the EIA Directive), 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."*

Recital 15 of the EIA Directive states that for projects:

> *"It is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment."*

Annex IV of the EIA Directive states, where appropriate, the assessment 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."*

This chapter has also been carried out in compliance with Schedule 6 paragraph 2(h) of the Planning and Development Regulations 2001 (as amended) which requires:

> *"a description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment 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, emergencies arising from such events."*

The structure and assessment methodology of this chapter is guided by the Institute of Environmental Management and Assessment (IEMA) 'Major Accidents and Disasters in EIA: A Primer' guidance (IEMA, 2020). The IEMA guidance defines a major accident as:

> *"An event (for instance, train derailment or major road traffic accident) that threatens immediate or delayed serious environmental effects to human health, welfare and/or*

the environment and requires the use of resources beyond those of the client or its appointed representatives (i.e. contractors) to manage."

The IEMA guidance defines the likely significant effects (in relation to a major accident and/or natural disasters assessment) as something that:

'...could include the loss of life, permanent injury and temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration.'

18.1.1 Statement of Authority

This chapter was prepared by Oonagh Fleming of TOBIN. Oonagh Fleming is an Assistant Project Manager in TOBIN. Oonagh holds a B.A. in Geography and Sociology. She has over three years' experience as an environmental consultant and has considerable experience in carrying out associated impact assessments including in preparing assessments in relation to major accidents and natural disasters. Oonagh has worked on serval renewable energy projects such as Cloghercor Wind Farm and Scart Mountain Wind Farm.

This chapter has been reviewed by John Dillon (BSc, MSc, MCIWM, PGeo), an environmental and hydrogeological specialist with over 18 years of experience in geological and hydrogeological assessment for Environmental Impact Assessment (EIA)s. He holds a master's degree in environmental engineering from Imperial College London and is a Chartered Member of the Chartered Institution of Wastes Management (MCIWM) and a Professional Geologist (PGeo). He has contributed to over 30 EIARs across sectors such as infrastructure, extractive industries, renewable energy, and land development.

18.1.2 Legislation, Policy and Guidance

The legislation, policy and guidance that was used to inform the assessment of risk of major accidents and natural disasters is listed below.

Legislation

- Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013) (as amended);
- No. 10 of 2005 – Safety, Health and Welfare at Work Act 2005;
- No. 46 of 2015 - Climate Action and Low Carbon Development Act 2015 (as amended);
- S.I. No. 209 of 2015 - Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (the "COMAH Regulations").

Policy

- Offaly County Council, Offaly County Development Plan 2021 – 2027;
- Tipperary County Council, Tipperary County Development Plan 2022-2028;
- Offaly County Council Major Emergency Plan 2019;
- Tipperary County Council Major Emergency Plan 2014.

Guidance

- 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;
- IEMA 2020 – Major Accidents and Disasters in EIA: A Primer;
- Department of Environment, Heritage and Local Government (2010) A Guide to Risk Assessment in Major Emergency Management;
- Department of Defence (2020) A National Risk Assessment for Ireland;
- Department of Environment, Community and Local Government (DECLG), (August 2018); Guidelines for Planning Authorities and An Bord Pleanála [now An Coimisiún Pleanála] on carrying out Environmental Impact Assessment).

18.1.2.1 EIA Directive

The EIA guidance document: EIA Guidance – EIA report (2017) identified key considerations in relation to major accidents and natural disaster risks and identified that EIARs should address issues such as:

- What can go wrong with a Project?
- What negative consequences might occur to human health and to the environment?
- What is the range of magnitude of negative consequences?
- How likely are these consequences?
- What is the Project's state of preparedness in case of an accident/disaster?
- Is there a plan for an emergency situation?

This chapter has considered each of the above points within this chapter as highlighted in Table 18-1 below.

Table 18-1 Key Considerations as Described in EIA Directive

Key Considerations	Location Within this Chapter
What can go wrong with a Project?	A risk assessment of all potential major accidents and natural disasters which are relevant to the project is carried out in Section 18.4. Risks that are described and assessed elsewhere in the EIAR are discussed in Section 18.4.
What negative consequences might occur to human health and to the environment?	Potential negative consequences discussed in Table 18-5.
What is the range of magnitude of negative consequences?	Section 18.4 classifies and assesses each of the risks considered within this chapter. In Table 18-6 a consequence rating is assigned to each potential risk which describes the magnitude of negative consequences. Where risks have been assessed elsewhere in the EIAR and are summarised within Section 18.3, the key findings and

	magnitude of negative consequences of these risks are discussed within this section and in the relevant EIAR chapter.
How likely are these consequences?	Section 18.4 and Table 18-6 assigns a likelihood rating to each potential risk. Where risks have been assessed elsewhere in the EIAR and are summarised within Section 18.3, the likelihood of these risks are discussed within this section and in the relevant EIAR chapter.
What is the Project's state of preparedness in case of an accident/disaster?	Mitigation measures are discussed within Table 18-6 to describe the proposed project's state of preparedness.
Is there a plan for an emergency situation?	The Environmental Emergency Response Procedures are detailed in the Construction Environmental Management Plan (CEMP). As noted in the CEMP, The Contractor will be responsible for developing a detailed environmental Emergency Response Plan (ERP) for the proposed construction works, environmental emergencies, as part of the H&S Plan.

18.2 Assessment Methodology

The impact assessment methodology is risk based and identifies all relevant potential unplanned risk events that the proposed project may be vulnerable to or that may occur due to the proposed project. There are three stages involved in determining such events adopted from A Guide to Risk Assessment in Major Emergency Management (DoEHLG 2010) and the Major Accidents and Disasters in EIA: A Primer guidance (IEMA, September 2020):

Stage 1: Screening/Identification – identifying potential unplanned risk events that the proposed project may be vulnerable to or that may occur as a result of the proposed project.

Stage 2: Classification – Following the initial identification and screening process, major accidents and/or natural disasters were evaluated with regard to the likelihood of occurrence and the potential impact; and

Stage 3: Assessment - This stage provides a greater understanding of the likelihood and consequence of events that have been carried forward into the EIA and defines a post mitigation risk score.

Potential hazards listed in the HSE Emergency Management: Area 1 Emergency Plan with relevance to the proposed project have also been considered within this assessment.

18.2.1 Stage 1: Screening

The screening stage of the assessment is a high-level exercise listing key relevant risk events (unplanned) that the proposed project may be vulnerable to or that may be caused by the proposed project. In accordance with the EC (2017) document; EIA of Projects – Guidance on the preparation of the EIAR guidance, risks are identified in respect of the proposed projects

- potential to cause accidents and/or natural disasters,
- and vulnerability to potential natural disasters/accidents.

The list of risks has been developed through the identification of reasonably foreseeable risks in consultation with relevant contributors to this EIAR. 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 the construction, operation and maintenance and decommissioning phases.

The list of identified risks were subject to a screening exercise to determine if the risks meet the criteria of a major accident or natural disaster as defined by the IEMA 2020 guidelines as described below.

The IEMA (2020) provide the following definitions for a major accident and disaster.

> Major Accidents are *"Events that threaten the immediate or delayed serious environmental affects to human health, welfare and/or the environment and require the use of resources beyond those of the client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g., train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events."*
>
> A Disaster *"May be a natural hazard (e.g., earthquake) or a man-made/external hazard (e.g., act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident."*

Where appropriate, risks were also screened out of the assessment according to the following criteria in line with the Major Accidents and Natural Disasters in EIA: A Primer guidance (IEMA, September 2020):

- The risk event is not applicable to a particular geographic location (e.g. volcanic or earthquake activity in Ireland); and
- Risks that have already been assessed in other areas of this EIAR, for example flood risk.

18.2.2 Stage 2: Classification

Following the screening stage any remaining major accident and/or natural disaster events were evaluated with regard to the likelihood of occurrence and the potential impact. The classification and rating of both the likelihood and impact are provided in Table 18-2 and 18-3 below. These classifications and ratings are taken from DoHELG (2010) A Guide to Risk Assessment in Major Emergency Management. The EPA Guidelines (EPA 2022) state that the risk assessment must be based on a 'worst case' approach. Therefore, the consequent rating assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or natural disaster.

Table 18-2 Classification of Likelihood (adapted[1] from DoEHLG 2010 guidance).

Rating	Classification	Likelihood
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 communications; 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 organisations 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.

Table 18-3 Classification of Consequence (adapted from DoEHLG (2010) guidance).

Rating	Classification	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 Euros. • 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 Euros. • Normal community functioning with some inconvenience.
3	Serious	Life, Health, Welfare Environment,	• 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

[1] Adapted to present the information clearly for the reader in this context, using a table format relevant to the focus of this chapter.

		Infrastructure, Social	evacuated. External resources required for personal support. • Simple contamination, widespread effects or extended duration. • 3-10M Euros. • 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 Euros. • 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 2,000 evacuated. • Very heavy contamination, widespread effects of extended duration. • >25M Euros. • Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support.

18.2.3 Stage 3: Assessment

In accordance with the DoEHLG's (2010) guidelines, the evaluated major accidents and/or natural disasters from Stage 2 were subject to a risk-based assessment to determine the level of significance of each risk for each scenario. The risk matrix, described in DoEHLG's (2010) guidelines indicates the critical nature of each risk. Each risk from. The risk matrix is described below and presented visually Table 18-4.

The risk matrix consists of three zones;

- The red zone represents '**high risk** scenarios'; having an evaluated score of 15 to 25.
- The amber zone represents '**medium risk** scenarios'; having an evaluated score of 8 to 12.
- The green zone represents '**low risk** scenarios.' having an evaluated score of 1 to 6.

Table 18-4 Impact Assessment Matrix (adapted from DoEHLG (2010) guidance)

Likelihood Rating	5 – Very Likely	5	10	15	20	25
	4 – Likely	4	8	12	16	20
	3 – Unlikely	3	6	9	12	15
	2 - Very Unlikely	2	4	6	8	10

	1 – Extremely Unlikely	1	2	3	4	5
		1 – Minor	2 – Limited	3 – Serious	4 – Very Serious	5 - Catastrophic
		Consequence Rating				

The IEMA 2020 guidelines recommends that the major accidents and/or natural disasters assessment focuses on low likelihood but potentially high consequence events. Therefore, for the purposes of this assessment and to also bring this in line with DoEHLG's (2010) guidance, it has been assumed that the Red Zone is high likelihood/high consequence, and the Amber Zone is medium likelihood/high consequence. All major accidents and/or natural disasters that fall within the Amber or Red Zones ('Medium' or 'High' risk scenarios) are considered to present a risk of significant effects following EPA Guidelines (EPA 2022).

18.2.4 Study Area

The study area for the Major Accidents and Natural Disasters assessment is the proposed project boundary, as shown in Figure 1-1 of Chapter 1 (Introduction). This incorporates the proposed wind farm site, the proposed grid connection route (GCR) and turbine delivery route (TDR) works areas see Section 2.1 of Chapter 2, Description of the Proposed Project for further details.

In addition to the project footprint, the wider surrounding area has been considered where relevant to the identification of potential sources of major accident or natural disaster risk. This includes, for example, the presence of external hazards or sensitive receptors in proximity to the Proposed Project, such as Seveso establishments, major transport infrastructure, utilities, watercourses, and areas susceptible to natural hazards (e.g. flooding, wildfire, or extreme weather events).

Where appropriate, this assessment also draws upon relevant findings from other topic assessments within the EIAR (e.g. traffic and transport, hydrology and flood risk, land and soils). In such cases, the study areas defined within those assessments are considered applicable.

18.3 Existing Environment

A summary of the baseline environment focusing on aspects relevant to the risk major accidents and natural disasters is provided below. This section summarises relevant details from assessments carried out within the EIAR. Refer to Section 1.3 of Chapter 1 Introduction for further detail regarding the site of the proposed project.

18.3.1 Meteorological

Ireland has a temperate, oceanic climate that results in typically mild winters and summers. Compared to other countries at similar latitudes Ireland does not experience the same extremes

of temperature, largely due to the influence of the Atlantic Ocean on Ireland's climate. The hills and mountains of Ireland provide shelter from strong winds and the oceanic influence[2].

Ireland's geographical location means it is less vulnerable to extreme natural hazards and disasters such as tsunamis or earthquakes. In recent years however, the occurrence of severe weather events has increased. Such weather events include extreme heat or cold, heavy rainfall, snow, extreme winds which have the potential to disrupt project activity.

The nearest Met Éireann weather and climate monitoring station which is representative of the proposed project, and which has long term 30-year (1991-2020) meteorological data, is Dublin Airport. The data for the 30-year period from 1991 to 2020 indicates that the wettest months at Dublin Airport Meteorological Station were October and November, and the driest month on average was March (Met Éireann, 2024a). July was the warmest month with a mean temperature of 15.4 Celsius. January was the coldest month with a mean temperature of 5.2 Celsius.

Latest Research from the EPA in 2025 in the form of the publication of their first National Climate Change Risk Assessment indicate the predicted changes in Ireland's climate in the coming decades, including:

- Temperatures are projected to increase by 1.2–1.6°C by 2050 under a moderate emissions scenario (RCP4.5), and up to 2.0°C to 2.4°C by 2100 under a high emissions scenario (RCP8.5);
- Warm days (above 20°C) will become more frequent, especially in the east and midlands;
- Heatwaves are expected to increase in frequency, duration, and intensity, posing risks to health, agriculture, and infrastructure;
- Frost days (days below 0°C) are projected to decrease by 50–60% by mid-century, and up to 80% by 2100 under high emissions. This reduction is most pronounced in southern and coastal regions;
- Snowfall will become increasingly rare, with significant implications for ecosystems and seasonal water storage;
- Winter rainfall is projected to increase by 10–20% by 2050, especially in western regions;
- Summer rainfall may decrease by up to 15%, increasing drought risk in the east and southeast; and
- Sea levels around Ireland are projected to rise by 0.5 to 0.8 metres by 2100 under high emissions.

TRANSLATE (Met Éireann, 2024a) provides the first standardised and bias-corrected national climate projections for Ireland to aid climate risk decision making across multiple sectors (for example, transport, energy, water), by providing information on how Ireland's climate could change as global temperatures increase to 1.5˚C ,2˚C, 2.5˚C, 3˚C or 4˚C. Ireland's climate is strongly influenced by the Atlantic Meridional Overturning Circulation (AMOC), which moderates temperature extremes. Although the AMOC is projected to weaken by 30–40% by

[2] https://www.met.ie/climate/climate-of-ireland (accessed March 2025)

2100—potentially cooling North Atlantic sea surface temperatures and contributing to additional sea level rise—Ireland is still expected to warm, though possibly less than continental Europe. Chapter 17 provides further details.

18.3.1.1 The Climate Change Risk Assessment

Chapter 17 (Climate) of this EIAR considers the likely impacts of future climate change in Section 17.7.3.

A detailed Climate Change Risk Assessment (CCRA) of the construction phase was scoped out (see Section 17.4.2 of Chapter 17) and consideration has been given to the proposed project's vulnerability to the following climate change hazards with best practice mitigation measures proposed in Section 17.8.2:

- Flood Risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;
- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow; and
- Major Storm Damage – including wind damage.

A CCRA has been carried out with respect to the operational phase of the project.

Potential impacts of climate change on the proposed project include:

- Flooding;
- Extreme Wind, Fog, Lightning and Hail;
- Wildfires;
- Landslides;
- Extreme Temperatures (Heat & Cold).

The risk assessment assesses the likelihood and consequence of likely impacts occurring and then provides an evaluation of the significance of the impact and considers the implementation of mitigation measures. All risks discussed within the CCRA are considered to have a low likelihood for risk to the proposed project, which are overall not significant.

Chapter 10 (Air Quality) discusses mitigation relevant to climate hazards such lightning strikes.

18.3.2 Hydrology

18.3.2.1 Flood Risk

A Flood Risk Assessment (FRA) has been carried out as part of the EIAR, see Appendix 9-3. A summary of the key findings of the FRA are included here.

<u>Fluvial Flooding</u>

The Flood Risk Assessment for the proposed wind farm identified that Turbines 1, 2, 8, and 9 are at risk of fluvial flooding during both 1 in 100-year and 1 in 1000-year events. To mitigate this, all critical infrastructure will be elevated above the 1 in 1000-year Mid-Range Future Scenario

(MRFS) flood[3] level, with a minimum elevation of 46.5mOD and additional freeboard. Approximately 3000m³ of compensation storage will be provided near Turbine 2 to offset the minor loss of floodplain (0.011km²) caused by construction, which is negligible compared to the total floodplain area (3.085km²).

Coastal Flooding

The proposed project is at minimal risk of coastal flooding due to its distance inland from coastal waters.

Groundwater Flooding

There is no evidence to suggest groundwater as a potential source of flood risk to the proposed wind farm site.

Pluvial Flooding

Pluvial flood extents do not inundate any of the turbines or access roads.

Surface water arising on the proposed mixed-use development will be managed by a dedicated stormwater drainage system in accordance with Sustainable Drainage Systems (SuDS) principles, limiting discharge from the site to greenfield runoff rates.

The landscaping and topography of the developed site will provide safe exceedance flow paths and prevent surface water ponding to minimise residual risks associated with an extreme flood event or a scenario where the stormwater drainage system becomes blocked.

Based on the results of this flood risk assessment, it is estimated that the risk of flooding to the proposed wind farm will be minimal, and that the proposed project will not increase the risk of flooding elsewhere. No likely significant negative effects are predicted.

18.3.2.2 Contamination

Potential risk related to contamination is discussed within Chapter 9 (Hydrology and Hydrogeology). Detailed mitigation is provided within Chapter 9, the Construction Environmental Management Plan (Appendix 2-3) and the Surface Water Management Plan (Appendix 9-4), as a result of mitigation described there is no risk associated with contamination.

18.3.3 Land, Soils and Geology

The topography of the proposed windfarm site comprises mostly cutover bog, wet grassland, mixed broadleaved woodland, coniferous woodland and scrub. General elevation in the area ranges from 45 m AOD (Above Ordinance Datum) to 65 m AOD. Low-lying area of bog is located one to the east and one to the west of the proposed wind farm either side of elevated ridge. The area to the south of the proposed wind farm can be described as having a drumlin and ribbed moraine topography which is shown by the rolling hills dominating the landscape. The area to the east of the proposed wind farm can be classified as having rolling to gently undulating hills

[3] The 2019 Flood Risk Management Climate Change Sectoral Adaptation Plan outlines how climate change is incorporated into flood risk management by applying Mid-Range and High-End future scenarios, which include specified allowances for increased rainfall, river flows, and sea level rise; the Flood Risk Assessment adopted the MRFS as it represents a likely future scenario.

comprising glacial sediments. The eastern boundary of the proposed wind farm is marked by the north westerly flowing Little Brosna River.

After applying mitigation measures—such as careful siting of infrastructure, site-specific temporary works for deeper peat, and standard design and supervision practices - the planning stage PSRA (Appendix 8-2) concludes that excavation-related instability poses a negligible hazard. Routine measures during design, construction, operation, and decommissioning will further reduce risk, including safe excavation angles or temporary supports like sheet piles or rock berms. Deterministic stability assessments confirm short- and long-term stability, even under extreme weather, supporting the site's suitability for development. As such no likely significant effects are predicted in this regard.

Potential risk related to contamination is discussed within Chapter 9. Detailed mitigation is provided within Chapter 9, and the CEMP (Appendix 2-3).

18.3.4 COMAH (Seveso) establishments

The Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (the "COMAH Regulations"), implement the Seveso III Directive (2012/18/EU). The purpose of the COMAH Regulations is to lay down rules for the prevention of major accidents involving dangerous substances. Seveso sites are defined as Industrial sites that, because of the presence of dangerous substances in sufficient quantities, are regulated under the Seveso III Directive.

COMAH (Control of Major Accidents and Hazards) (Seveso) establishments are designated as such as they pose an identified risk to public and environmental health and safety and are regulated by the Health and Safety Authority (HSA). COMAH establishments are categorised in two tiers – Upper Tier and Lower Tier depending on their activity.

The proposed project including the substation and BESS will not come under the Control of Major Accident Hazards (COMAH) Regulations.

The closest COMAH establishment is the Lower Tier Electricity Supply Board West Offaly Power Station located in Shannonbridge, Co. Offaly, which is located approximately 23km from the proposed wind farm site and 17km from the nearest point on the proposed GCR. West Offaly power station is currently being decommissioned. There are no lower tier sites in County Tipperary.

There are two COMAH establishments located in proximity to the proposed TDR in Foynes Port; Atlantic Fuel Supply Company Ltd. (Upper Tier) and Chemifloc Foynes Ltd (Lower Tier). However, works along the proposed TDR, at this point, will be short-term and temporary in nature and as such no interactions with COMAH sites are anticipated.

18.3.5 Major Infrastructure and Built Services

A detailed assessment of major infrastructure built services and waste services in relation the proposed project has been carried out in Chapter 15 (Material Assets).

18.3.5.1 Aviation

Local air traffic is limited and infrequent; Birr Airfield, located approximately 3 km northwest of the proposed wind farm site. There are no other small airfields or air strips within 10 km of the proposed wind farm site. The proposed wind farm site is located approximately 75 km northeast

of Shannon Airport. Following implementation of mitigation detailed in Chapter 15 Material Assets no significant effects related to aviation are anticipated.

18.3.5.2 Telecommunications

There are three telecom links within and surrounding the proposed wind farm site, The analysis indicated that T11 would obstruct the Fresnel Zone of the Eir 'Eir_L2' link potentially affecting its operation. Chapter 15 and Appendix 15-1 detail the mitigation measures in relation to this link. Following the implementation of mitigation measures, no likely significant effects in relation to telecommunications are predicted.

18.3.5.3 Major Infrastructure and Built Services

All strategic infrastructure has been considered within the assessment (see Chapter 15 (Material Assets)). It is possible that the proposed GCR will have some interaction with Uisce Éireann underground infrastructure. Appropriate mitigation will be followed to ensure no significant impacts will occur.

While all strategic infrastructure has been considered within the EIAR there is a possibility of some infrastructure, particularly underground infrastructure, being discovered during the proposed works, particularly near public roads and houses or farmyards. As such, the potential risk of a major accidents and/or natural disaster in relation to strategic infrastructure is considered within the assessment in this chapter. Chapter 15 Material Assets details associated mitigation and concludes that there are no likely significant effects during the construction, operation or decommissioning phases.

18.4 Assessment of Risk

18.4.1 Do-Nothing / Future Baseline

With respect to major accidents and/or disasters, the 'Future Baseline/ Do Nothing' scenario means that there are no changes to the lands associated with the proposed project site, which comprises largely agricultural with areas of coniferous forestry occurring. The risk associated with climate change related issues would continue to change over time. The site would continue to be used as is and surrounding roads continue to operate as they currently do. Therefore, there would be a Neutral impact on risk of major accidents and/or disasters under the 'Do Nothing' Scenario.

18.4.2 Stage 1: Screening

The list of relevant risk events considered to meet the criteria of a potential major accident and/or natural disaster and therefore require further assessment are listed in Table 18-5 below.

Risks were screened at this stage using the criteria from Section 18.2 above and either screened in for further assessment or screened out from the process.

The identification of risk types was informed by a review of relevant legislation and guidance, documented incidents at wind farm developments in Ireland and internationally (e.g. turbine failure, fire, or collapse) and consultation with the EIA project team.

Any permutations within the proposed range of turbine dimensions (See Chapter 2 - Description of the Proposed Project) have been considered within this assessment and will not affect the potential risks discussed below and subsequent significance of the predicted impacts.

Permutations within the proposed range of turbine dimensions are considered within relevant assessments in this EIAR.

Variations of 0.5 m in blade tip height within the assessed range would not materially alter the nature, likelihood, or consequence of the potential major accident or natural disaster events identified (e.g. turbine failure, fire, or collapse). Where turbine dimensions are relevant to specific environmental topics, this has been addressed within the relevant chapters. Accordingly, the conclusions of this assessment apply to all proposed turbine permutations.

Table 18-5 Major Accidents and Natural Disasters – Stage 1 Risk Register

Risk ID	Stage	Risk Event and Consequence	Possible Cause(s)	Discussion	Screened In For Further Assessment (Y/N)
A	Construction	Potential striking of strategic infrastructure resulting in damage, disruption to services and / or fatalities / injuries	Interaction with unknown strategic underground services (such as power, water & telecommunications); faulty equipment or procedures; contractor error.	As discussed above, Chapter 15 Material Assets concludes that there are no likely significant effects during the construction, operation or decommissioning phases. As such, this risk is not considered further within this chapter. Please refer to Chapter 15 and the CEMP (Appendix 2-3) for associated mitigation.	N
B	Construction / Decommissioning	Contamination of ground or surface water. This is associated with construction works.	Heavy rain during construction activities; Mobilisation of contamination during construction activities such as excavation, fuel spillage, seepage, stockpiled material providing a point source of exposed sediment, erosion.	This risk has been discussed in Section 18.3.2.2 and Chapter 9 it was found that there are no significant risks, post mitigation. As such, this risk is not considered further within this chapter.	N
C	Construction / Decommissioning	Major traffic accidents resulting from construction phase traffic or temporary construction traffic management measures	Heavy vehicles (HVs) navigating through narrow roads. Driver error - not abiding by potential re-routing or management measures.	Likelihood for major accident due to increase in traffic and HVs using construction routes and site access points. This risk has been screened in for further consideration.	Y

Risk ID	Stage	Risk Event and Consequence	Possible Cause(s)	Discussion	Screened In For Further Assessment (Y/N)
D	Construction / Operational / Decommissioning	Movement of peat within the site during construction / Landslide	Mismanagement of excavated material on site. Severe weather conditions-storm, flooding	This has been considered within Chapter 8, as described above in Section 18.3.3. The findings of the land, soils, geology assessment found there to be no significant risks, post mitigation. As such, this risk is not considered further within this chapter.	N
E	Construction / Operational / Decommissioning	Flooding of site during construction, operational and decommissioning stage.	Periods of heavy prolonged rainfall. Climate change.	The likelihood for flooding risk has been considered within the Flood Risk Assessment and Chapter 9 Hydrology and Hydrogeology, as described in 18.3.2. The results of the flood risk assessment indicated that the risk of flooding to the proposed wind farm, substation, and all associated works will be minimal. Therefore, this risk is not considered further within this assessment.	N
F	Construction / Operational / Decommissioning	Collision risk resulting in damage to infrastructure and/or injuries	Low flying planes	Aviation has been considered within Chapter 15 Material Assets, as discussed in Section 18.3.5.1 and effects on aviation are not anticipated. As such, this risk is not considered further within this chapter.	N
G	Construction / Operational / Decommissioning	Incident at nearby Seveso site involving release of dangerous substances.	Fire / explosion or an infrastructure failure at a Seveso site	As discussed above in Section 18.3.4 the proposed project is not a COMAH or nuclear installation and no interaction is anticipated between a COMAH site and the proposed project. As such, this risk is not considered further within this chapter.	N
H	Construction / Operational /	Collapse / damage of structures/infrastructure.	Earthquake	The cause of this risk (earthquake) is not considered applicable to this geographic location	N

Risk ID	Stage	Risk Event and Consequence	Possible Cause(s)	Discussion	Screened In For Further Assessment (Y/N)
	Decommissioning			as discussed above in Section 18.3.1. As such, this risk is not considered further within this chapter.	
I	Construction / Operational / Decommissioning	Risks related to climate change such as increased frequency and strength of storms, heightened flood risk, risk of extreme temperatures.	Climate change	The likelihood for climate change associated risks has been considered within Chapter 17 (Climate) as described in Section 18.3.1. The assessment concluded that the risks considered within the CCRA were deemed to have a low likelihood for risk. As such, this risk is not considered further within this chapter.	N
J	Operational	Collapse / damage of turbine structures / infrastructure at BESS/substation	HVs collision; Severe weather.	There is potential for a major accident with a building / structure collapse including the potential for injuries. This risk has been screened in for further consideration.	Y
K	Construction / Operational / Decommissioning	Fire at wind turbines, BESS or substation during construction / operation phase resulting in damage to infrastructure and/or injuries.	Lightning strike; Overheating; Equipment failure.	There is potential for lightning strike resulting in damage to infrastructure and/or injuries. There is potential risk of fire caused by, for example, overheating within the BESS or equipment failure. This risk has been screened in for further consideration.	Y
L	Operational	Ice falling from wind turbine blades	Injury from flying ice from wind turbine blades	Potential for injury, damage to infrastructure. This risk has been screened in for further consideration.	Y

Risks A, B, D, E, F, G, H and I were not brought forward for further consideration as discussed in Table 18-5.

Risks C, J, K and L were considered to meet the potential of a major accident and/or natural disaster and require further assessment relative to the proposed project.

18.4.3 Stage 2: Classification and Assessment

Table 18-6 below considers risks C, J, K and L that were brought forward for further consideration.

The design of the proposed project incorporates mitigation measures. Following consideration of these measures the risks were assigned a consequence and likelihood rating to determine their risk score.

Table 18-6 Major Accidents and Disasters – Risk Classification Considering Mitigation

Risk ID	Stage	Risk Event and Consequence	Possible Cause(s)	Overview of Mitigation	Likelihood Rating	Consequence Rating	Risk Score
C	Construction / Decommissioning	Major traffic accidents resulting from construction phase traffic or temporary construction traffic management measures	HVs navigating through narrow roads. Driver error - not abiding by potential re-routing or management measures.	The risk of major accidents and/or natural disasters resulting from a road traffic accident associated with the proposed project will be reduced by the development and implementation of a construction phase Traffic Management Plan (TMP) (Appendix 2-2) and Chapter 14, Traffic and Transportation. The Traffic Management Plan is a live document (i.e. subject to review and updates pre-construction) and will be developed through the detailed design and construction phase with ongoing consultation with the Local Authority, An Garda Síochána, Emergency Services and other stakeholders	3	2	6
J	Operational	Collapse / damage of turbine structures / infrastructure at BESS/substation	HVs collision; Severe weather.	Extensive and detailed confirmatory ground investigation will be undertaken by the appointed Contractor to inform the detailed design and appropriate construction technologies and plant to be deployed. Contractors with a proven track record in delivering work of the scope required by the works will be appointed. Given the nature of their use, the turbines are designed to be placed in high wind environments and therefore	2	3	6

Risk ID	Stage	Risk Event and Consequence	Possible Cause(s)	Overview of Mitigation	Likelihood Rating	Consequence Rating	Risk Score
				significant research has gone into their ability to withstand extreme wind loadings There are no dwellings located within 550 m of the proposed turbine locations, therefore the risk to residential receptors from turbine collapse is not considered significant. The proposed tip height of the turbines is between 179.5 m-180 m, therefore all residential dwellings are significantly removed from any area of a potential turbine collapse. The Emergency Response Plan of the proposed project is detailed within the CEMP (see Appendix 2-3).			
K	Construction / Operational / Decommissioning	Fire at wind turbines, BESS or substation during construction / operation phase resulting in damage to infrastructure and/or injuries.	Lightning strike; Overheating; Equipment failure	The risk of fire has been considered within the design of the proposed project. The BESS is a containerised system with inbuild ire detection and aerosol/gas suppression systems. All components will be designed, assembled and maintained and constructed to meet the requirements UL9540, UL9540A, and NFPA 855. There is potential for lightning strike resulting in damage to infrastructure and/or injuries. Chapter 17 details mitigation in relation to lightning strikes. This is considered to have a low likelihood risk as discussed above in section 18.3.1.1 Furthermore, A BESS Fire Risk Assessment has been conducted as part of this EIAR (see Appendix 2-7). The	2	3	6

Risk ID	Stage	Risk Event and Consequence	Possible Cause(s)	Overview of Mitigation	Likelihood Rating	Consequence Rating	Risk Score
				Fire Risk Assessment states that when considering the level of monitoring and controls that will be implemented for the proposed project the risk of fire occurring is considered to be as tolerable as reasonably practicable,.			
L	Operational	Ice falling from wind turbine blades	Injury from flying ice from wind turbine blades	The Draft 2018 WEDGs refer to the very remote possibility of injury to people (or animals) from flying fragments of ice or from a damaged blade but note that most blades are composite structures with no bolts or separate components and that most turbines are fitted with anti-vibration sensors, which will detect any imbalance caused by icing of the blades and prevent start-up. Modern Wind Turbine Generators have incorporated an advanced blade anti-icing solution to their design. The Anti-Icing system uses electro-thermal heating elements embedded in the blade material to prevent ice build-up and allow turbines to function in cold climates.	2	2	4

The results from the evaluation of risk, have been summarised/categorised in Table 18-7 below.

Table 18-7 Risk Assessment Evaluation

Likelihood Rating	5 – Very Likely					
	4 – Likely					
	3 – Unlikely					
	2 - Very Unlikely			C, J, K		
	1 – Extremely Unlikely			L		
		1 – Minor	2 – Limited	3 – Serious	4 – Very Serious	5 - Catastrophic
		Consequence Rating				

From assessing the likely risks and mitigation measures presented in Table 18-6, Risks C, J, K and L all fall within the green zone and were considered low risk scenarios broadly acceptable with mitigation measures.

This chapter presents a completed risk assessment of major accidents and natural disasters relevant to the proposed project. This chapter assessed if the proposed project likely to have significant negative effects deriving from its vulnerability to risk of Major Accidents and/or Natural Disasters, and what is the likelihood of the proposed project itself to cause potential Major Accidents and/or Natural Disasters during the construction, operation and decommissioning phases? Should the project proceed, risk management will continue as a live process throughout the detailed design, construction, operational, and decommissioning phases, with existing plans subject to ongoing review and updates.

18.5 Residual Assessment

This chapter has assessed the likely risk of major accidents and natural disasters from the construction, operation and decommissioning phases of the proposed project. In accordance with the DoEHLG guidance the risk of a major accident and/or natural disaster is considered 'Low'.

With implementation of the mitigation measures already detailed in Chapter 6 - 18 in this EIAR (Table 18-5 and 18-6), there will not be significant residual effects associated with the proposed project.

18.6 Cumulative Assessment

In the assessment of cumulative effects, any other existing, permitted or proposed developments in the surrounding area have been considered where they have the potential to

generate in-combination or cumulative effects with the proposed project (see Chapter 4 of this EIAR for a full description of developments considered).

The nearest operational wind farms to the proposed wind farm are Skehanagh and Carrig (Lacka) Wind Farms respectively, located 1.7 km and 2.7 km west of the nearest proposed turbine (T6). The proposed turbines for Carrig Wind Farm (AIR)[4] are located 3.9 km to 5.3 km northwest of the T1 and T3, which received a grant permission from ACP in June 2025.

Construction Phase

Drainage management measures will be employed during the construction phase of the proposed project which will ensure that there is no flood risk to the downgradient (downstream) of the proposed wind farm site as described in Section 18.4.3 and Chapter 9 Hydrology and Hydrogeology). As such the proposed project will not contribute to flood risks.

There is a slight, increased chance of traffic accidents in relation to granted Carrig Wind Farm, particularly if the construction phases overlap. However, following the implementation of appropriate mitigation as described above, Chapter 14 Traffic and Transportation and the TMP (Appendix 2-2) no significant effects are predicted.

Operational Phase

Considering the low likelihood of occurrence and the implementation of appropriate mitigation measures in relation to the risk of fire and the risk of falling ice there is no significant cumulative effects predicted in relation to these risks. In the unlikely event that an extreme weather event resulted in structural failure of a wind turbine, the consequence would remain localised to the individual turbine. Due to the separation distances between the proposed wind farm and neighbouring wind farms no cumulative effects are anticipated.

The risk of likely traffic accidents is considered to be very low during the operational phase.

There are no potential cumulative effects identified for any part of the proposed project (including the route of the proposed GCR, or along the proposed TDR). This is based upon the low risk of major accidents or natural disasters associated with the proposed project and a review of the projects in the surrounding area.

Decommissioning Phase

The wind turbines proposed are expected to have a lifespan of 35-years. Following the end of their lifespan, the wind turbines may be replaced with a new set of machines, subject to planning permission being obtained, or the proposed wind farm may be decommissioned fully, with the exception of the electricity substation, proposed GCR and other electrical equipment. The BESS will be removed during the decommissioning phase. The activities required to facilitate wind turbine decommissioning and removal from site will be similar to those outlined for the construction phase, albeit in reverses and to a lesser extent and duration than during the construction stage. As such no cumulative effects are anticipated for the decommissioning phase.

[4] Atlantic Infrastructure Renewables

18.7 Conclusion

This chapter has assessed the vulnerability of the proposed project to major accidents and natural disasters, as well as the potential of the proposed project itself to cause potential major accidents and/or natural disasters during the construction, operation and decommissioning phases Where significant effects have been identified, additional mitigation will be implemented in full and has been incorporated into the assessment.

Table 18-7 confirms the significance of any residual effects following the application of mitigation measures. Following the assessment with mitigation measures, the risks fall within the green zone and were considered low risk scenarios. Any permutations within the proposed range of turbine dimensions will not affect the significance of the likely effects.

With all mitigation measures implemented there are no significant residual effects from the proposed project in relation to the risk of major accidents and/or natural disasters.

18.8 REFERENCES

Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) – COMAH Regulations

Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (as amended)

Department of Defence (2020) – A National Risk Assessment for Ireland

Department of Environment, Community and Local Government (DECLG) (August 2018) – Guidelines for Planning Authorities and An Bord Pleanála [now An Coimisiún Pleanála] on carrying out Environmental Impact Assessment

Department of Environment, Heritage and Local Government (2010) – A Guide to Risk Assessment in Major Emergency Management

Environmental Protection Agency (2022) – Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

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

European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU) – The EIA Directive

IEMA (2020) – Major Accidents and Disasters in EIA: A Primer

Institute of Environmental Management and Assessment (IEMA) (2020) – 'Major Accidents and Disasters in EIA: A Primer' guidance

Offaly County Council, Offaly County Development Plan 2021 – 2027

Offaly County Council Major Emergency Plan 2019. Available at https://www.offaly.ie/app/uploads/Council/Council_Services_A-Z/Emergency_Services/Offaly-County-Major-Emergency-Plan-2019.pdf

Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013) (as amended)

Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005)

Tipperary County Council, Tipperary County Development Plan 2022-2028

Tipperary County Council Major Emergency Plan 2014. Available at https://www.tipperarycoco.ie/sites/default/files/2022-07/Tipperary%20Major%20Emergency%20Plan.pdf