atmos CONSULTING

61253

Environmental Impact Assessment Report

# Cummeennabuddoge Wind Farm

## Chapter 17: Major Accidents and Natural Disasters

## Cummeennabuddoge Wind (DAC)

September 2024

# Contents



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## Glossary of Terms

| Term | Definition |
|---|---|
| The Applicant | Cummeennabuddoge Wind Designated Activity Company (DAC) |
| The Agent | Atmos Consulting Limited |
| Environmental Advisors and Planning Consultants | Atmos Consulting Limited |
| Environmental Impact Assessment | A means of carrying out, in a systematic way, an assessment of the likely significant environmental effects from a development |
| Environmental Impact Assessment Regulations | Schedule 6 of the Planning and Development Regulations 2001(as amended) |
| Environmental Impact Assessment Report | A document reporting the findings of the EIA and produced in accordance with the EIA Regulations |
| The Proposed Development | Cummeennabuddoge Wind Farm |
| The Proposed Development Site | The land enclosed by the red line shown on Figure 1-1a |
| The Planning Act | Directive 2011/92/EU (as amended by Directive 2014/52/EU, the EIA Directive). |

## List of Abbreviations

| Abbreviation | Description |
|---|---|
| AEP | Annual Equivalent Probability |
| CEMP | Construction Environmental Management Plan |
| COMAH | Control of Major Accident Hazards |
| CTMP | Construction Traffic Management Plan |
| DoEHLG | Department of the Environment, Heritage & Local Government |
| EIA | Environmental Impact Assessment |
| EIAR | Environmental Impact Assessment Report |
| EPA | Environmental Protection Agency |
| HSE | Health Service Executive |
| IEMA | Institute of Environmental Management and Assessment |
| PMP | Peat Management Plan |
| PSR | Peat Stockpile Restriction |
| PSRA | Peat Stability Risk Assessment |
| RTC | Road Traffic Collisions |
| SERP | Site Emergency Response Plan |

# 17 Major Accidents and Natural Disasters

## 17.1 Introduction

This chapter of the EIA Report assesses the likelihood of significant effects on the environment arising from the vulnerability of the Proposed Development to risks of major accidents and/or natural disasters.

Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (as amended by Directive 2014/52/EU, the EIA Directive, European Commission (2011, 2014) states that an EIA should 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."*

and should ensure that appropriate precautionary actions are taken for those projects that;

> *"…"because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment".*

Accordingly, this assessment determines:

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

Major accidents and natural disasters are hazards which have the potential to affect the Proposed Development and result in impacts on the environment. These include accidents during construction, operation and decommissioning caused by operational failure or the impact of natural disasters.

The potential to impact the environment considers all factors considered in this EIAR, i.e., population and human health, biodiversity, land, soil (peat stability), water, air and climate and material assets, cultural heritage and the landscape.

### 17.1.1 Statement of Authority

This chapter has been prepared by Malcolm Sangster MSc (Environmental Chemistry), BSc (Hons) Chemistry of Atmos Consulting Ltd.

Malcolm has 15 years' experience in environmental risk assessment and has undertaken assessment of the vulnerability of projects to major accidents and natural disasters for National scale developments (including windfarms) as part of EIAs in the UK.

## 17.2 Methodology and Approach

### 17.2.1 Legislation, Planning Policy and Guidance

#### European Commission: Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report

The Guidance on the preparation of the Environmental Impact Assessment Report (European Commission 2017) refers to Annex IV of the EIA Directive highlighting two key considerations:

- The Project's potential to cause accidents and/or disasters (In this case, the Directive explicitly refers to considerations for human health, cultural heritage, and the environment); and
- The vulnerability of the Project to potential disaster/accident.

The guidance states that when including a disaster/accident risk assessment in an EIAR, the assessment should address the following:

- *"What can go wrong with a Project?*
- *What adverse consequences might occur to human health and to the environment?*
- *What is the range of magnitude of adverse 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?"*

#### Environmental Protection Agency: Guidelines on the information to be contained in Environmental Impact Assessment Reports

The Environmental Protection Agency (EPA) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022) require that the vulnerability of a project to climate change be addressed, particularly;

> *"…the risk of major accidents and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge"*

The guidance also states that an EIAR should explicitly address the issue and offers the following guidance:

> *"The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other legislation e.g., a COMAH (Control of Major Accident Hazards involving Dangerous Substances) assessment."*

## A Framework for Major Emergency Management Guidance Document 1 A Guide to Risk Assessment in Major Emergency Management January 2010

A Framework for Major Emergency Management Guidance Document 'A Guide to Risk Assessment in Major Emergency Management' (Department of the Environment, Heritage & Local Government (DoEHLG, 2010) provides a framework for a risk assessment process in the following manner:

1. Establish the context (i.e., describe the area);
2. Hazard Identification;
3. Risk Assessment; and
4. Record potential hazards on a risk matrix.

## EPA Guidance on Assessing and Costing Environmental Liabilities

The EPA Guidance on assessing and costing environmental liabilities (EPA 2014) offers a similar approach to the DoEHLG risk assessment:

1. Risk Identification;
2. Risk Analysis (likelihood and consequence); and
3. Risk Evaluation to prioritise risks for treatment [1].

## Health Service Executive (HSE) Major Emergency Management Plans

The HSE has produced a number of Area Emergency Plans (HSE 2023) for the purpose of:

> *"…ensuring that the necessary planning, preparedness, capacity, training and coordination is in place at all levels of the health service to enable it to meet the challenges posed by such events."*

None of these plans cover the area in which the Proposed Development site is located, however they identify a list of potential hazards that could constitute a major emergency under the following categories:

- Natural;
- Transportational;
- Technological; and
- Civil.

## Institute of Environmental Management and Assessment (IEMA) Major Accidents and Disasters in EIA: A Primer

The IEMA publication Major Accidents and Disasters in EIA: A Primer (IEMA 2020) provides guidance of conducting assessments specifically in relation to the risk of major

[1] This document is targeted at installations falling under EPA authorization regimes including the Industrial Emissions Directive (IED), Integrated Pollution Prevention and Control (IPPC), waste, waste water discharge (WWD) and dumping at sea (DaS) and so terminology such as 'treatment' in this context is more applicable to remediating land and water contamination

accidents. Whilst the guide is aimed at EIA practitioners in the UK, it does contain a definition of 'Major Accident' which is absent from other legislation or other guidance:

> *"Events that threaten immediate or delayed serious environmental effects 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."*

## 17.2.2 Assessment Methodology

### Definition of 'Major Accident' and 'Natural Disaster'

The IEMA definition of Major Accident has been used as a guide in determining whether environmental incidents should be classified as Major Accidents.

This definition is also taken to cover the term Natural Disaster and is applicable both to the vulnerability of the Proposed Development to these events and to events occurring as a result of the Proposed Development.

This definition is not adhered to rigidly as it is recognised that damage to the windfarm infrastructure and certain events (peat slide in particular) may be manageable by the Applicant and their contractors (Client and Representative in the terms of the IEMA definition) without the need for other resources.

### Assessment Methodology

As specific guidance on assessing risk for EIA is not available a bespoke approach based on the above guidance has been used using the following method:

- Baseline conditions. This consists of the Proposed Development and context in terms of the receiving environment and is described in Chapter 4 of this EIAR and in the baseline/receiving environment sections of all other chapters in this EIAR;
- Risk Identification. This is a list of risks both in terms of the vulnerability of the Proposed Development to major accidents and natural disasters and the risk of major accidents caused by the Proposed Development itself;
- Risk Analysis. This is an assessment of the likelihood and consequence for each of the identified risks in accordance with the criteria below; and
- Risk Evaluation. This evaluates each risk in accordance with the matrix below in order to determine which risks require mitigation.

### Risk Identification

**Vulnerability of the Proposed Development to Major Accidents and Natural Disasters**

In terms of identifying the vulnerability of the Proposed Development to major accidents and natural disasters, the list of potential hazards developed by the HSE (HSE 2023) has been used as the basis.

## Risk Classification

### Classification of Likelihood

The likelihood of any particular risk developing into a major accident has been determined in accordance with the classification criteria contained within the DoEHLG report (DoEHLG, 2010) and shown in Table 17-1.

In determining the likelihood of any particular risk, the controls and mitigation described in each applicable Chapter were taken into account.

**Table 17-1: 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 every 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 classification of consequence also uses the criteria described in the DoEHLG guidance and shown in Table 17-2. Any applicable mitigation or control methods that have been prescribed in the EIAR has been taken into account.

**Table 17-2: Classification of Impact (Source: DoEHLG, 2010)**

| Ranking | Impact | Impact Type | Description |
|---|---|---|---|
| 1 | Minor | Life, Health, Welfare | Small number of people affected; no fatalities and small number of minor injuries with first aid treatment. |
| | | Environment | No contamination, localised effects |

| Ranking | Impact | Impact Type | Description |
|---|---|---|---|
| | | Infrastructure | <€0.5M |
| | | Social | Minor localised disruption to community services or infrastructures (<6 hours) |
| 2 | Limited | Life, Health, Welfare | Single fatality; limited number of people affected; a few serious injuries with Hospitalisation and medical treatment required |
| | | Environment | Localised displacement of a small number of people for 6-24 hours. Personal support satisfied through local arrangements.<br>Simple contamination, localised effects of short duration. |
| | | Infrastructure | €0.5-3M |
| | | Social | Normal Community functioning with some inconvenience. |
| 3 | Serious | Life, Health, Welfare | 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.<br>External resources required for personal support. |
| | | Environment | Simple contamination, widespread effects or extended duration |
| | | Infrastructure | €3-10M |
| | | Social | Community only partially functioning, some services available. |
| 4 | Very Serious | Life, Health, Welfare | 5 to 50 fatalities, up to 100 serious injuries, up to 2000 evacuated |
| | | Environment | Heavy contamination, localised effects or extended duration |
| | | Infrastructure | €10-25M |
| | | Social | Community functioning poorly, minimal services available |
| 5 | Catastrophic | Life, Health, Welfare | Large numbers of people impacted with |

| Ranking | Impact | Impact Type | Description |
|---|---|---|---|
| | | | significant numbers of fatalities (50>), injuries in the hundreds, more than 2000 evacuated |
| | | Environment | Very heavy contamination, widespread effects of extended duration |
| | | Infrastructure | >€25M. |
| | | Social | 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

The evaluation of the risk is derived using the matrix described in the DoEHLG guidance and shown in Table 17-3 below. The colour coding indicates a risk that has been determined as follows:

- Green: Low Risk;
- Amber: Medium Risk; and
- Red: High Risk.

All medium and high risks are considered 'Significant' in terms of the EIA Directive and are evaluated further to determine applicable mitigation that could reduce their likelihood and/or consequence allowing the residual effects to be determined.

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.

**Table 17-3: 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 | | | | | |

## 17.3 Baseline Conditions

The baseline conditions consist of the Proposed Development as described in Chapter 4 of this EIAR, the Proposed Development Site and surroundings including the sensitive receptors described in the other Chapters of this EIAR.

## 17.4 Risk Identification

### 17.4.1 Vulnerability of the Proposed Development to Major Accidents and Natural Disasters.

The Proposed Development is vulnerable to a number of risks as per Table 17-4.

**Table 17-4: Major Accident and Natural Disaster Risks to the Proposed Development**

| Category | Hazard | Potential Outcome |
|---|---|---|
| Meteorological | Storm / Gale.<br>Both coastal and inland areas can be affected by high winds | Injury /Fatality of personnel<br>Damage /loss of infrastructure.<br>Failure of electricity export capability |
| | Heavy Snow | Roads inaccessible<br>Road Traffic Accidents<br>Hypothermic patients |
| Hydrological | Flooding (for example as a result of heavy rainfall) | Injury /Fatality of personnel<br>Site inaccessible<br>Damage/Loss of infrastructure<br>Failure of electricity export capability |
| Fire | Forest Fire | Injury /Fatality of personnel<br>Damage/loss of infrastructure<br>Failure of electricity export capability |
| Terrorism | Explosion / Fire / Sabotage | Injury /Fatality of personnel<br>Damage/loss of infrastructure<br>Failure of electricity export capability |

### 17.4.2 Risk of Major Accidents/ Natural Disasters posed by the Proposed Development

The risk posed by the Proposed Development is determined by the nature of the Proposed Development as described in Chapter 4 of the EIAR and the nature of the receiving environment. These are identified in Table 17-5.

**Table 17-5: Major Accident and Natural Disaster Risks posed by the Proposed Development**

| Category | Hazard | Potential Outcome |
|---|---|---|
| Hydrological | Flooding due to the alteration of run off rates resulting in flooding elsewhere | Displacement of communities<br>Injury/Fatality<br>Public Health Risks<br>Damage /loss of Property<br>Damage to ecological receptors |
| Geological | Peat Landslide caused by the | Injury /Fatality |

| Category | Hazard | Potential Outcome |
|---|---|---|
| | installation of infrastructure | Damage to ecological receptors<br>Loss of peat<br>Contamination of surface/groundwater |
| Contamination | Discharge of potentially polluting liquids to surface/goundwater | Contamination of surface/groundwater damage to ecological habitats/species |
| Road | Major traffic collision | Injury /Fatality |
| Fire/ Explosion | Petrochemical / Electrical fire | Injury /Fatality of personnel<br>Damage/ Loss of infrastructure<br>Contamination of surface/groundwater damage to ecological habitats/species |
| Industrial Accident | Failure of infrastructure | Injury /Fatality<br>Damage/loss of infrastructure<br>Failure of electricity export capability |

## 17.5 Risk Likelihood and Consequence

The Likelihood and Consequence of the risks identified above are defined in the sections below.

### 17.5.1 Major Accident/Natural Disaster Risks to the Proposed Development

#### Meteorological

Ireland has a temperate, oceanic climate, resulting in mild winters and cool summers. Consequently, Ireland does not suffer from the extremes of temperature experienced by many other countries at similar latitude. The hills and mountains, many of which are near the coasts, provide shelter from strong winds and from the direct oceanic influence.

However, severe weather events do occur and are considered to be increasing in magnitude and frequency as a result of climate change.

The principal major accident risk is during construction where construction personnel and incomplete infrastructure might be vulnerable to severe weather. Once complete, the wind turbines are designed and built to withstand the high windspeeds and heavy precipitation encountered in exposed locations even during severe weather events and in the context of likely future climate change effects.

The works programme for the construction stage of the Proposed Development will take account of weather forecasts and work will be suspended in the case of extreme weather events (as defined by Met Éireann).

The following forecasting and weather warning systems are available and will be used on a daily basis at the Proposed Development Site to direct proposed construction activities:

- General Forecasts: Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates;

- Weather Warning or Advisories: Met Éireann's main suite of warnings are issued by the duty forecaster between 10am and midday and are updated as necessary as new information becomes available. In general, warnings will not be issued more than 60- hours ahead of the expected adverse weather but advisories on potential hazards are issued up to a week in advance. The three warning categories are:
  - Yellow: Not unusual weather. Localised danger;
  - Orange: Infrequent. Dangerous/disruptive; and
  - Red: Rare. Extremely dangerous/destructive;
- MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale;
- 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events;
- Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and
- Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest.

Should a weather warning be identified for the Proposed Development Site, work will cease on site and personnel will be directed to leave the site if present. The decision to evacuate the Proposed Development Site will be made on the basis of prevalent and predicted conditions by the Site Manager in the case of Yellow warnings. Orange or Red weather warnings will result in a pre-emptive cessation of work.

Taking these basic precautionary measures into account the likelihood of a Major Accident/Natural Disaster as a result of meteorological risks is Unlikely (3) and a Consequence of Minor (1) for the Construction and Decommissioning phases of the Proposed Development and a likelihood of Very Unlikely (2) and a consequence of Minor (1) for the Operational Phase.

## Hydrological

According to the mapping available on the Office of Public Works' (OPW) Floodinfo website (https://www.floodinfo.ie/ ) the Proposed Development Site is not in an area identified as being at risk of flooding (>0.5% Annual Equivalent Probability (AEP[2])) and no recurring flood incidents within the Proposed Development Site or immediately downstream were identified from OPW's Flood Hazard Mapping.

Short term surface water flooding (pluvial flooding) can occur in the event of significant rainfall, however, this has been considered as part of the Flood Risk Assessment undertaken as part of this EIAR (Technical Appendix 11-1). This concludes that the

[2] The probability of a flooding event occurring in any given year equivalent to a 1 in 200 year event

Proposed Development is not considered as being at risk of flooding within the terms described in the guidance.

Accordingly, the likelihood of a Major Accident or Natural Disaster as a result of hydrological risks is Very Unlikely (2) and a Consequence of Minor (1) for all phases of the Proposed Development.

## Fire

Wildfires in Ireland are rare as its mild moist climate ensures that prolonged droughts are very rare. Whilst fires in mature forests seldom occur, younger plantations are vulnerable to fire especially during late spring and early summer when dead ground vegetation accumulated during the previous season begins to dry out.

The European Commission JRC report Advance report on Forest Fires in Europe, Middle East and North Africa 2022 (European Commission 2023) identified a total burnt area of 3,409ha from 69 fires in Ireland in 2022, which was described as close to average for the previous few years. The majority of this burnt area was Other Natural Land (91.8%) as opposed to coniferous and mixed forest (0.8%).

This represents 0.03% of the total forest cover[3] in Ireland.

Met Éireann publish fire Weather Index information to highlight fire risk (https://www.met.ie/forecasts/farming/graphs/fire-weather-index ) and the Department of Agriculture, Food and the Marine issue Fire Danger Notices when appropriate. These will be used on a daily basis during the construction phase to identify fire risk with work ceasing in the event of high risk as per the Weather Index.

Should a significant wildfire incident occur at the Proposed Development site during operation it could result in significant, even catastrophic damage to the infrastructure.

Accordingly, the likelihood of a Major Accident as a result of fire risks is Very Unlikely (2) and a Consequence of Serious (3) for all phases of the Proposed Development.

## Terrorism

There are no records of any terrorist attack on renewable energy infrastructure and the remote nature of the Proposed Development Site would make it an unlikely target in any event.

Accordingly, the likelihood of a Major Accident as a result of terrorism is Very Unlikely (2) and a Consequence of Minor (1) for all Phases of the Proposed Development.

[3] Teasasc: Ireland's Forests- Statistics 2023. Available at: https://www.teagasc.ie/news--events/daily/forestry/irelands-forests---statistics-2023.php#:~:text=In%202022%2C%20the%20fourth%20National,glacial%20stage%2010%2C000%20years%20ago

### 17.5.1 Risk of Major Accidents/ Natural Disasters posed by the Proposed Development

#### Hydrological

The alteration of natural drainage systems and changes in land use can result in increased run off rates and cause flooding downstream.

The Proposed Development will include the removal of forestry and a change in habitat; however, this is not dissimilar to the changes experienced through the normal crop rotation on the Proposed Development Site and will not result in a significant change to the hydrological regime (see Chapter 11 of this EIAR).

There are no impermeable hand standings proposed and other surfaces will incorporate drainage that will not significantly increase run off rates.

Accordingly, the Likelihood of a Major Accident due to the Proposed Development causing flooding is considered Very Unlikely (2) with a Consequence of Minor (1) for all phases of the Proposed Development.

#### Geological

Peat is present on the Proposed Development site with peat thickness encountered by intrusive investigations across the site varying from 0m to a maximum of 5.4m, often displaying sharp variation locally.

The depths encountered are considered to be moderate to deep in places: with approximately 57% of locations indicate a peat thickness of greater than 1m. Approximately 84% of locations were identified peat thickness less than 2m, and the remaining locations, 16%, identified deeper than 2m (see Appendix 10-3: Peat Management Plan (PMP)).

The stability risk of the peat has been assessed with the results presented in a Peat Stability Risk Assessment (PSRA, see Appendix 10-2). This assessment has been undertaken on a similar basis to the assessment undertaken in this Chapter (likelihood /consequence) and determined that the peat stability risk is low /negligible for the proposed infrastructure (see Section 5 of the PSRA).

Construction of the Proposed Development will require excavation and temporary stockpiling of peat which can also pose a stability risk. The PRSA has identified peat stockpile restriction buffers (PSR) to be adhered to at all phases of the Proposed Development. The concept of the PSR is explained in Section 4.5.1 in the PSRA and presented in Appendix L of the PSRA.

Peat landslide can result in loss of habitat, loss of the peat itself and damage to watercourses (including a detrimental effect on water quality should the slide take place in the vicinity of the watercourses).

Once construction is complete there will be no further disturbance to the peat with the risk of landslide reverting to its natural state. Decommissioning will not involve the removal of subsurface structures, accordingly, the risk of peat landslide this phase would not increase.

There is no evidence of any occurrence of natural peat landslide in this area, hence it is not considered as a risk to the Proposed Development.

Accordingly, the Likelihood of a Major Accident due to a peat landslide is considered Very Unlikely (2) with a Consequence of Serious (3) for the Construction phase of the Proposed Development, reverting to Extremely Unlikely (1) with a Consequence of Serious (3) for Operation and Decommissioning.

A Site Emergency Response Plan (SERP) has been prepared as part of the Construction Environmental Management Plan (CEMP). This would be implemented in the event of a (Very Unlikely) peat landslide.

## Contamination

Construction of the Proposed Development will entail the storage of diesel fuel will be stored in sufficient quantities to pose a risk of a Major Accident and only then in the event of a catastrophic failure of containment.

Controls on the storage of fuel will include the use of secondary containment. Both primary and secondary containment would have to fail simultaneously in order for a release of significant quantity of fuel to be released.

Release of a significant quantity of fuel could result in pollution of ground and surface water and damage ecological habitats.

During operation and decommissioning there will be no storage of significant quantities of fuel effectively removing the risk of a Major Accident involving contamination

The likelihood of a major contamination accident is considered Very Unlikely (1) with a Consequence of Serious (3) for the construction phase and not applicable for the other phases.

## Road

The construction of the Proposed Development will result in an increase in road traffic volumes on public highway which potentially increases the risk of a road traffic collisions (RTC). As any RTC would require the involvement of emergency services all RTCs are considered as Major Accidents for the purpose of this assessment.

The risk of RTC as a result of the Proposed Development was considered as part of the Traffic and Transport Chapter of the EIAR (Chapter 7) and it was concluded that the collision statistics for the major roads in the vicinity of the Proposed Development Site was typical of primary roads such that no special consideration of accident risk is required.

The traffic assessment concluded that the construction of the Proposed Development will result in a maximum increase in traffic volumes of between 0.6% to 1.5% during the peak construction period.

The relationship between traffic volumes and accident frequency has been studied with a number of studies suggesting a linear relationship between traffic volumes and RTC frequency with one in particular (Retallack and Ostendorf, 2020) illustrating that this may be true at lower traffic volumes such as may be experienced on rural Irish roads.

Taking this as an assumption and using an average of the annual RTC statistics compiled as part of the traffic statistics of 27 collisions per year, the construction of the Proposed Development is not likely to result in a single additional RTC over the course of the 24 month construction period.

Modern safety features in vehicles mean that serious injuries and fatalities are not common (and reflected in the statistics referred to above with an average of 30% of RTCs resulting in fatality or serious injury).

Accordingly, the likelihood of a Major Accident associated with traffic is considered Unlikely (2) with a Consequence of Limited (2) during construction. There will be lower traffic volumes during operation and decommissioning, however, this is unlikely to reduce this risk rating during these phases.

## Fire/Explosion

The construction of the Proposed Development will not involve the storage of potentially flammable materials particularly larger volumes of diesel fuel. However, diesel does not readily ignite with a flashpoint of approximately 55 °C.

Fuel will be stored away from other infrastructure to avoid any incident causing significant damage or injury.

There is the possibility of the turbine in the nacelle of a wind turbine igniting as a result of mechanical or electrical failure, however, previous incidents have been rare and resulted in local damage to the turbine nacelle only.

There may be a need for blasting in the process of creating borrow pits. This would necessitate the use of explosives. This would be managed by a specialist contractor with the use and storage undertaken in accordance with the relevant legislation. No explosives would be stored on the Proposed Development Site.

Accordingly, the likelihood of a Major Accident as a result of fire or explosion is considered Unlikely (2) with a Consequence of Minor (1).

## Industrial Accident

The construction and operation of a windfarm can expose personnel to the risk of injury due to the nature of the work.

There are no available incident statistics for windfarms in Ireland, however, SafetyOn, the health and safety organisation for the onshore wind sector in the UK, compiles annual statistics on incidents related to the construction and operation of onshore windfarms (SafetyOn, 2020,2021). These statistics show an annual average figure of recordable incidents of 0.63 incidents per 100,000 hours worked over 2020 and 2021.

As with RTCs, every incident is considered likely to require the resources of the emergency or health services and therefore qualifies as a Major Accident in terms of the definition used in this assessment.

The statistics also show that 86% of reported incidents took place during operation with 12% during the construction and the rest taking place pre-construction.

Assuming the maximum number personnel working on site (30) during the most intensive period of the Proposed Development (construction) during every available working hour in a year (2,080), the maximum possible number hours that would be worked on the Proposed Development is approximately 62,000.

This equates to a maximum figure of 0.39 incidents during construction meaning that it is statistically unlikely that an incident will occur during construction.

During operation, a minimal number of personnel will be on Site for the purposes of maintenance equating to no more than a few hundred working hours per year. Decommissioning will entail a greater number of hours than operation but fewer than construction owing to the small scope of the works (removal of above ground structures).

The considerably lower working hours anticipated during operation and decommissioning makes an incident statistically unlikely for the duration of these phases too.

The statistics record no fatalities over the two years reported and minimal incidents requiring treatment.

Accordingly, the likelihood of a Major Accident as a result of an industrial accident is considered Unlikely (2) with a Consequence of Minor (1).

## 17.6 Risk Assessment

The assessment of the risk posed for each category is shown on tables Table 17-6 and Table 17-7 based on the determined likelihood and consequence assessed for each.

**Table 17-6: Major Accident/ Natural Disaster Risks to the Proposed Development**

| Category | Likelihood | Consequence | Risk |
|---|---|---|---|
| Meteorological | 2 -3 | 1 | Low Risk |
| Hydrological | 2 | 1 | Low Risk |
| Fire | 2 | 3 | Low Risk |
| Terrorism | 2 | 1 | Low Risk |

**Table 17-7: Major Accident Risks posed by the Proposed Development**

| Category | Likelihood | Consequence | Risk |
|---|---|---|---|
| Hydrological | 2 | 1 | Low Risk |
| Geological | 1-2 | 3 | Low Risk |
| Contamination | 1 | 3 | Low Risk |
| Road | 2 | 2 | Low Risk |
| Fire/ Explosion | 2 | 1 | Low Risk |
| Industrial Accident | 2 | 1 | Low Risk |

Based on the above, no mitigation is necessary and the residual risk for all categories is Low.

## 17.7 Cumulative Risks

None of the categories of risk have the potential to interact cumulatively with other developments with the exception of Road risk whereby the cumulative increase in traffic may serve to increase the risk of RTCs.

An assessment of cumulative traffic impacts has been undertaken as part of the traffic assessment (Chapter 7 of this EIAR) which identified three other windfarms in the vicinity of the Proposed Development with the potential to have cumulative effects.

It is unlikely that the peak construction period associated with another wind farm development in the area would overlap with the peak construction period of the

Proposed Development as the applications are at different stages in the planning process and each development has varying lengths of construction.

The high traffic generating activities, such as the importation of stone and concrete, only occur over a few months of the whole construction period for each development. It is unlikely that the local capacity for concrete and stone production could supply several developments at once, therefore, high traffic generating activities would naturally be staggered.

Furthermore, implementation of a Construction Traffic Management Plan (CTMP) for each development would ensure that there are open lines of communication with Cork County Council, Kerry County Council, An Garda Síochána, the roads authorities, other stakeholders and wind farm developers to monitor the progress of the construction stages.

This process would flag whether construction HGV traffic is reaching unacceptable levels and would ensure that action is taken accordingly to minimise effects.

Accordingly, it is not considered that the cumulative traffic increase will be sufficient to increase the risk of RTC when even doubling the peak traffic volumes from the cumulative developments is still not likely to result in a single additional RTC over the course of the 24 month construction period.

Accordingly, the cumulative risk of Major Accidents as a result of traffic remains Low and Not Significant.

## 17.8 Summary and Statement of Significance

The Proposed Development has the potential to be at risk of Major Accidents and/or Natural Disasters in relation to a number on potential categories. The Proposed Development also has the potential to pose a risk of Major Accidents and/or Natural Disasters in itself.

A systematic assessment has been undertaken using established guidance for quantifying risk involving identification of potential risks based on the judgement of the assessor on similar developments elsewhere and other types of development.

An assessment of the likelihood and consequence of Major Accidents and/or Natural Disasters has been undertaken for each category of risk identified which has determined that the Major Accident and/or Natural Disasters risk both to and as a result of the Proposed Development is Low for all categories.

As such no mitigation is necessary and the residual risk for all categories is Low and Not Significant in terms of the EIA Directive.

No significant cumulative risks have been identified.

## 17.9 References

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