

Sure Partners Limited

ARKLOW BANK WIND PARK
PHASE 2
**ONSHORE GRID
INFRASTRUCTURE**

**ENVIRONMENTAL IMPACT
ASSESSMENT REPORT**

VOLUME II

Chapter 19 Major Accidents and Disasters

ARUP

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Renewables

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19 Major Accidents and Disasters

19.1 Introduction

This chapter describes likely significant negative effects on the environment arising from the vulnerability of the proposed development to risks of major accidents and/or disasters.

The assessment of the vulnerability of the proposed development to major accidents and disasters is carried out in compliance with the EIA Directive which states the need to provide:

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

The underlying objective of this assessment is to ensure that appropriate precautionary actions are taken for those projects which *“because of their vulnerability to major accidents and/or natural disasters, are likely to have significant adverse effects on the environment”*.

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

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

19.2 Assessment Methodology

19.2.1 General

The scope and methodology of this assessment is centred on the proposed development, as described in **Chapter 5 Description of Development** and **Chapter 6 Construction Strategy**, which will be built and operated in line with good industry practice. As such, major accidents resulting from the proposed development will be very unlikely.

The scope and methodology presented in the following sections is based on the provisions of the EIA Directive, the Environmental Protection Agency (2017) Draft *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*, European Commission (2017) *Guidance on the preparation of the EIA Report (Directive 2011/92/EU as amended by 2014/52/EU)* and other published risk assessment methodologies as described in **Section 19.2.3** as well as professional judgement.

A risk analysis-based methodology that covers the identification, likelihood and consequence of major accidents and/or disasters has been used for this assessment (as detailed in **Section 19.2.6.2**).

The assessment of the risk of major accidents and/or disasters considers all factors defined in the EIA Directive that have been considered in this EIAR, i.e. population and human health, biodiversity, land, soil, water, air and climate and material assets, cultural heritage and the landscape.

19.2.2 Key Definitions

Key terms used in this chapter are set out below and are based on Institute for Environmental Management and Assessment (IEMA) (2020) *Major Accidents and Disasters in EIA – A Primer*.

A major accident is an event 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 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 man-made/external hazard (such as an act of terrorism) or a natural hazard (such as an earthquake) with the potential to cause an event or situation that meets the definition of a major accident.

Vulnerability - describes the potential for harm as a result of an event, for example due to sensitivity or value of receptors. In the context of the EIA Directive, the term refers to the ‘exposure and resilience’ of the development to the risk of a major accident and/or disaster. Vulnerability is influenced by sensitivity, adaptive capacity and magnitude of impact.

19.2.3 Guidance and Legislation

19.2.3.1 Legislative Requirements

The following paragraphs set out the requirements of the EIA Directive in relation to major accidents and/or disasters.

Recital 15 of the EIA Directive states that:

“In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, 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. For such 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.”

In order to avoid duplications, it should be possible to use any relevant information available and obtained through risk assessments carried out pursuant to Union legislation, such as Directive 2012/18/EU of the European Parliament and the Council and Council Directive 2009/71/Euratom, or through relevant assessments carried out pursuant to national legislation provided that the requirements of this Directive are met.”

Article 3 of the EIA Directive requires that the EIAR shall identify, describe and assess in the appropriate manner, the direct and indirect significant effects on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage and landscape deriving from (amongst other things) the “*vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned*”.

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

“(8) A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies”.

19.2.3.2 Guidance Documents

A number of guidance documents and published plans have been reviewed and considered in order to inform this assessment, as described in the following sections.

European Commission (2017) Environmental Impact Assessment of Projects- Guidance on the preparation of the Environmental Impact Assessment Report

The European Commission Guidance outlines the legislative requirements and key considerations which should be taken into account in the preparation of EIARs with respect to accident and disaster risks.

The Guidance lists the following issues which EIARs should address:

- What can go wrong with a project?
- What adverse consequences might occur to human health and to the environment?
- 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?

EPA (2017) Draft EPA Guidelines on information to be contained in EIAR

The draft EPA guidelines refer to major accidents and/or disasters in a number of sections including:

- Characteristics of the project – The draft EPA guidelines state under Section 3.5.2 that the project characteristics should include “*a description of the Risk of Accidents – having regard to substances or technologies used.*”
- Impact assessment - The draft EPA guidelines state under Section 3.7.1 that the impact assessment should, in accordance with Annex IV(5) of the EIA Directive, include “*the risks to human health, cultural heritage or the environment (for example due to accidents or disasters).*”
- Likelihood of Impacts - The draft EPA guidelines state the following under Section 3.7.3:

“To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and /or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. 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 regulations e.g. a COMAH (Control of Major Accident Hazards involving Dangerous Substances) assessment.”

EPA (2014) Guidance on Assessing and Costing Environmental Liabilities

This EPA guidance document does not address major accidents and disasters specifically, as its purpose is to describe the approach to assessing and costing environmental liabilities associated with closure, restoration/aftercare and incidents occurring on sites falling under the various EPA authorisation regimes. However, the document provides guidance on the identification and quantification of risks, focusing on unplanned, but possible and plausible events that may occur during the construction and operational phases of licensed facilities and/or activities. Specifically, in Section 3.3, guidance is provided on a range of risk assessment and evaluation techniques.

DoEHLG (2010) A Framework for Major Emergency Management Guidance Document 1-A Guide to Risk Assessment in Major Emergency Management

The Department of the Environment, Heritage and Local Government, as it then was, published a guidance note in January 2010 on best practice in the area of risk assessment for major emergency management.

The document provides guidance on the various stages of the risk assessment process and how it should be employed to inform mitigation and detailed planning during major emergency situations. Part 1 of the guidance defines criteria for classifying impact and likelihood scenarios in order to support the risk assessment process, as well as a process for recording the risk assessment.

Department of Defence (2017) A National Risk Assessment for Ireland: Overview of Strategic Risks

The National Risk Assessment (NRA) provides an opportunity for the identification, discussion and consideration of risks facing Ireland over the short, medium and long term. Since the NRA was first published in 2014, the annual Report has served as an important indicator of national level risks and has called attention to various risks that Ireland might face. While not a specific guidance document, this document is used for reference purposes.

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

The Major Accidents and Disasters in EIA - A Primer, produced by IEMA and Arup, provides an assessment methodology for major accidents and disasters based on known current practice in the UK to date and provides definitions of key terminology. It offers a methodology for a proportionate assessment approach to determine a project’s vulnerability.

In the absence of a stand-alone guidance document for the assessment of Major Accidents and Disasters, including risk assessment methodology, a combination of the above guidance has been used to inform this assessment as deemed appropriate. **Table 19.1** includes a summary of the application of the guidance.

Table 19.1: Guidance Application

Guidance	Application of Guidance
DoD (2017)	References purposes - in formation on national level risks
DoEHLG (2010)	Criteria for categorising impact; risk classification – likelihood, consequence; risk evaluation and assessment methodology
EC (2017)	General guidance; aspects of project for which risks are identified.
EPA (2017)	General guidance
EPA (2014)	Guidance on the identification and quantification of risks of unplanned, but plausible events that may occur during the construction and operational phases; risk assessment methodology
IEMA (2020)	General guidance; definitions of “major accident”, “disaster” and “vulnerability”. (Note EC (2017) and EPA (2017) do not provide definitions of “major accident”, “disaster” or “vulnerability”, nor risk assessment methodology)

19.2.4 Study Area

The Arklow Bank Wind Park (ABWP) is an offshore wind farm, located off the coast of County Wicklow, on the east coast of Ireland.

Phase 1 of the wind park is operational (7 no. turbines) and Phase 2 is now progressing (this is the overall project of which the proposed development is part).

The proposed development will comprise the onshore grid infrastructure including 220kV onshore export cable circuits and fibre optic cables, from the landfall of the offshore export cable circuits at Johnstown North, to a proposed onshore 220kV substation at Shelton Abbey and from the new substation to the National Electricity Transmission Network (NETN).

The site at Shelton Abbey for the proposed onshore 220kV substation is the northern portion of a larger site which had been previously occupied by Irish Fertiliser Industries (IFI) up until 2003. The site is currently owned by Crag Digital Avoca Ltd, and there is an extant planning permission from Wicklow County Council to develop a data centre on an area adjacent to the proposed substation site (planning reference 18/940). There is a historic landfill, associated with the former IFI plant, to the east of the substation site, which is the subject of an EPA licence (Register Number: P0031-02). There is also an embankment on the northern side where the access road to the Avoca River Business Park is located.

The licensed site originally extended to include the proposed substation site, however, following a partial licence surrender, the substation site is now outside the licence boundary. The adjacent area to the east and southeast remains licensed by the EPA due to the historic landfill activities. No licence obligations remain in relation to the proposed substation site.

The land along the proposed cable route is primarily zoned as agricultural with some single residential dwellings. Some sections of the route are classed as mixed land use and new residential, with some small sections of the route passing through areas that are primarily urban in nature (being in public roads within Arklow). The urban areas are made up of employment areas (according to the Arklow and Environs LAP 2018-2024), residential areas and commercial areas.

The proposed development is described further in **Chapter 5** *Description of Development*.

19.2.5 Categorisation of the Baseline Environment

A desk-based study has been undertaken in order to establish the baseline environment on which the risk assessment is being carried out, as this will influence both the likelihood and the impact of a major accident and/or disaster.

As outlined in the guidance, establishing the local and regional context prior to completion of the risk assessment enables a better understanding of the vulnerability and resilience of the area to emergency situations. **Section 19.3** provides an overview of the baseline environment that has been considered for this assessment.

19.2.6 Impact Assessment Methodology

19.2.6.1 Current Practice

The scope and methodology of this assessment is based on the proposed development, as described in **Chapter 5** *Description of Development* and **Chapter 6** *Construction Strategy*. The proposed development will be built and operated in line with good industry practice, as per EirGrid 'Irish Grid Code' specification and, as such, the vulnerability of the proposed development to risks of major accidents and/or disasters is considered low.

Some potential accidents and disasters, such as pollution incidents to ground and watercourses as well as assessment of flooding events, are described in detail in the relevant EIAR assessment chapters (Refer to **Chapter 9** *Land and Soils* and **Chapter 10** *Water* for further detail).

19.2.6.2 Site-Specific Risk Assessment Methodology

Overview

The site-specific risk assessment identifies and quantifies risks focusing on unplanned, but possible and plausible events occurring during the construction and operation of the proposed development. The approach to identifying and quantifying risks associated with the proposed development by means of a site-specific risk assessment is derived from the EPA (2017) *Draft EPA Guidelines on information to be contained in EIAR*.

The criteria for categorising impact is derived from the DoEHLG (2010) *A Framework for Major Emergency Management Guidance Document 1-A Guide to Risk Assessment in Major Emergency Management* (refer to **Table 19.2** and **Table 19.3**).

The following steps were undertaken as part of the site-specific risk assessment:

- Risk identification;
- Risk classification, likelihood and consequence; and
- Risk evaluation.

Risk Identification

Risks have been reviewed through the identification of plausible risks in consultation with relevant specialists. The identification of risks has focused on potential hazards and the probability of occurrence during construction, operation and decommissioning.

In accordance with the European Commission Guidance (2017) *Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment*, risks are identified in respect of the project's:

- (1) Potential vulnerability to disaster risks; and
- (2) Potential to cause accidents and/or disasters.

Risk Classification

Classification of Likelihood

Having identified the potential risks, the likelihood of occurrence of each risk has been assessed. An analysis of safety procedures and proposed environmental controls was considered when estimating the likelihood of identified potential risks occurring. **Table 19.2** defines the likelihood ratings that have been applied.

The approach adopted has assumed a ‘risk likelihood’ where one or more aspects of the likelihood description are met, i.e. any risk to the proposed development less than ‘extremely unlikely’ to occur has been excluded from the assessment.

Table 19.2 : Risk Classification Table - Likelihood (Source DoEHLG)

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

Classification of Consequence

The consequence rating assigned to each risk has assumed that all proposed mitigation measures and/or safety procedures have failed to prevent the major accident and/or disaster. Furthermore, it has been assumed for the assessment that the Wicklow County Council (2017) *Major Emergency Plan* if implemented as intended, would work to reduce the consequence of any major accident or disaster. The consequence of the impact if the event occurs has been assigned as described in **Table 19.3**.

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

Table 19.3: Risk Classification Table – Consequence (Source DoEHLG)

Ranking	Consequence	Impact	Description
1	Minor	Life, Health, Welfare Environment Infrastructure Social	Small number of people affected; no fatalities and small number of minor injuries with first aid treatment. No contamination, localised effects <€0.5M Minor localised disruption to community services or infrastructure (<6 hours).
2	Limited	Life, Health, Welfare Environment Infrastructure Social	Single fatality; limited number of people affected; a few serious injuries with hospitalisation and medical treatment required. Localised displacement of a small number of people for 6-24 hours. Personal support satisfied through local arrangements. Simple contamination, localised effects of short duration €0.5-3M Normal community functioning with some inconvenience.
3	Serious	Life, Health, Welfare Environment Infrastructure Social	Significant number of people in affected area impacted with multiple fatalities (<5), multiple serious or extensive injuries (20), significant hospitalisation. Large number of people displaced for 6-24 hours or possibly beyond; up to 500 evacuated. External resources required for personal support. Simple contamination, widespread effects or extended duration €3-10M Community only partially functioning, some services available.
4	Very Serious	Life, Health, Welfare Environment Infrastructure Social	5 to 50 fatalities, up to 100 serious injuries, up to 2000 evacuated Heavy contamination, localised effects or extended duration €10-25M Community functioning poorly, minimal services available
5	Catastrophic	Life, Health, Welfare Environment Infrastructure Social	Large numbers of people impacted with significant numbers of fatalities (>50), injuries in the hundreds, more than 2000 evacuated. Very heavy contamination, widespread effects of extended duration. >€25M Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support.

Risk Evaluation

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

The risk matrix sourced from the DoEHLG guidance and as outlined in **Table 19.4** indicates the critical nature of each risk. This risk matrix has been applied to evaluate each of the risks associated with the proposed development. The risk matrix is colour coded to provide a broad indication of the nature of each risk:

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

Table 19.4: Risk Matrix (Source DoEHLG)

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

19.3 Baseline Conditions

According to the Wicklow County Council Major Emergency Plan, Wicklow County Council’s All Hazard Risk Assessment Process and the Eastern Region Major Emergency Planning Working Group recorded the following general and specific risks that may be faced in County Wicklow and within the Eastern Region:

1. Severe Weather
2. Mass Casualty/Crowd Incident
3. Industrial Accident/Seveso/Hazmat
4. Transport Incident
5. Terrorist Incident
6. Public Health
7. Loss of Utilities

The risks, which are most relevant to this assessment, are described below.

19.3.1 Severe Weather Conditions

Severe weather conditions pose one of the most common risks to Ireland and to the proposed development.

In recent times there has been an increase in the number of severe weather events in the country, particularly those leading to flooding and flash flood incidents.

Table 19.5 is taken from the Wicklow County Council Climate Adaptation Strategy (2019) and outlines the extreme weather events which have affected County Wicklow in recent years, including numerous flood events.

Arklow has experienced recurring flooding problems that have caused widespread damage to public and private property. The largest flood event recorded was in August 1986 resulting from extreme meteorological conditions commonly referred to as “Hurricane Charlie.” Further recent flooding events occurred in December 1989, November 2000, February 2002 and in October 2004, October 2005, January 2010, January 2013 and December 2015. Historical flooding in proximity to the proposed development is addressed in **Chapter 10 Water** and the Flood Risk Assessment (**Appendix 10.1 of Volume 3**).

Table 19.5: Extreme Weather Events Which Affected County Wicklow (List Is Non-Exhaustive) (Extract from The Wicklow County Council Climate Adaptation Strategy (2019))

EXTREME WEATHER EVENTS WHICH AFFECTED COUNTY WICKLOW (LIST IS NON- EXHAUSTIVE)									
YEAR	DATE	EVENT TYPE/ NAME	OUTLINE DESCRIPTION	CLIMATE EVENT					
				STRONG WINDS	EXTREME RAINFALL	HEAVY SNOW/FALLLOW TEMPS	SEA LEVEL RISE	DROUGHT	HEATWAVE
2018	September	Storm Ali	Orange wind warning - gale force winds of up to 120km/h, stormy conditions.						
2018	Summer	High Temperatures Heat wave and Drought	High temperatures, heat wave and drought. Interruption to water supply due to lack of raw water storage. Gorse fires - power cuts. Emergency services deployed to fighting gorse fires.						
2018	February/ March	Storm Emma and Beast from the East	Blizzard / Heavy Snowfall / Widespread heavy snow drifting. Disruption to business, water supply, emergency services, power cuts etc.						
2017	21st October	Storm Brian	High Sea levels - Damage to Murrough north of Wicklow Town.						
			Red warning - Gale Force winds, heavy rain and						

EXTREME WEATHER EVENTS WHICH AFFECTED COUNTY WICKLOW (LIST IS NON- EXHAUSTIVE)									
YEAR	DATE	EVENT TYPE/ NAME	OUTLINE DESCRIPTION	CLIMATE EVENT					
				STRONG WINDS	EXTREME RAINFALL	HEAVY SNOWFALL/LOW TEMPS	SEA LEVEL RISE	DROUGHT	HEATWAVE
2017	16th October	Storm Ophelia (Ex-Hurricane Ophelia)	storm surges along some coasts (flooding). Disruption to business, power cuts etc. Damage to Murrough north of Wicklow Town. Risk to damage of Wexford - Dublin Rail Line.						
2016	January	Heavy Rain	Wettest January on record - 126% of monthly average.						
2015	December	Storm Frank	Orange Wind Warning - Roads impassable - Murrough Damaged - Landslide in Wicklow Town.						
2015	November	Storm Barney	Short-term gale-force winds. Damage to Wicklow swimming pool roof and Rathnew GAA Clubhouse roof. Widespread water outages due to power cuts.						
2014	12th February	Storm Darwin	Orange warning for strong winds - classified as a 1 in 20-year event.						
2014	5th January	Storm Christine	Orange Warning - High Tides and coastal flooding.						
2013 / 2014	Winter	Winter Storms	Winter Storms - serious coastal damage and widespread, persistent flooding. West Wicklow badly hit with a large number of trees down.						
2011	24th October	Heavy Rain and Flooding	Heavy Rain in County Wicklow. 66mm in 9 hours in Casement Aerodrome approaching 1 in 100-year probability event. Extreme flooding caused.						
2010	November / December	Winter Cold Spell	Lowest Temperatures on record in Dublin Airport (-8.4oC)						
2009 /	Winter	Winter Cold Spell	Coldest Winter in almost						

EXTREME WEATHER EVENTS WHICH AFFECTED COUNTY WICKLOW (<i>LIST IS NON- EXHAUSTIVE</i>)									
YEAR	DATE	EVENT TYPE/ NAME	OUTLINE DESCRIPTION	CLIMATE EVENT					
				STRONG WINDS	EXTREME RAINFALL	HEAVY SNOWFALL/LOW TEMPS	SEA LEVEL RISE	DROUGHT	HEATWAVE
2010			50 years according to Met Éireann.						
2009	November	Severe Flooding	Rainfall totals were highest on record, extensive flooding.						
2008	August	Heavy Rain and Flooding	Heavy rain and extensive flooding.						
2006	Summer	High Temperatures and Heat wave.	Warmest Summer since record breaking 1996						
2002	14th November	Heavy Rain and Severe Flooding	Severe flooding in Eastern Areas. Wettest month on record at Casement Aerodrome.						
2002	1st February	Coastal Flooding	Eastern and Southern coasts - highest tide in 80 years.						
2000	5th November	Severe Flooding	11-112mm rainfall Wicklow/Dublin						
1997	24th December	Windstorm	Windstorm						
1995	Summer	High Temperatures Heat wave and Drought	Warmest Summer on record. Mean temperatures over 20C above normal. Temp rises to 30deg C over a number of consecutive days.						
1993	11th November	Severe Flooding	In excess of 100mm of rain in 24-hour period in East and Midlands.						
1987	12th 13th January	Heavy Snowfall	12 - 19mm snow in the East and Midlands.						
1986	August	Hurricane Charlie	Strong winds and rain, worst flooding in 100 years.						

19.3.2 Industrial Licensed Sites

There are two industrial sites within the vicinity of the proposed development (in the vicinity of Arklow), which are subject to Industrial Emissions Directive (‘IE’) Licences from the EPA:

- Crag Digital Arklow Limited – located adjacent to the proposed substation site (Licence No: P0031-02, the residual IFI Landfill); and
- Sigma-Aldrich Ireland Limited – located on Vale Road adjacent to the M11 motorway and close to the Avoca River (Licence No: P0089-05).

The Sigma Aldrich facility is also designated as a 'Seveso site', in accordance with Council Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances. This classification as a 'Seveso site' identifies the facility as an industrial establishment where dangerous substances are used or stored in large quantities. The occurrence of a major emission, fire or explosion resulting from a Seveso site has the potential to give rise to a major accident or disaster, immediate or delayed, inside or outside the establishment, and involving one or more dangerous substances. This site is a lower tier Seveso site located 800m south of the proposed substation site on the opposite side of the Avoca River and the M11 motorway.

As outlined in the Arklow Local Area Plan (2018-2024) the Sigma Aldrich facility has a consultation distance or radius of 1000m from its site boundary. The proposed development is within this 1000m buffer.

The planning authority is obliged to refer to the Health and Safety Authority (HSA), in assessing an application for planning permission for proposed developments that are located within the consultation distance of a Seveso establishment as is the case in this instance. The HSA is obliged to provide technical advice on safety and risk in relation to major hazards and land-use planning to the planning authority unless generic advice has been provided previously in relation to that establishment.

19.4 Characteristics of the Proposed Development

The proposed development will comprise the onshore grid infrastructure which includes:

- Connection by underground 220kV high voltage alternating current cable circuits, and fibre optic cables over a distance of approximately 6km, from the landfall at Johnstown North, located approximately 4.5km northeast of Arklow Harbour, to the new onshore 220kV substation,
- A new onshore 220kV substation, to be located at Shelton Abbey, north of the Avoca River, approximately 2.1km northwest of Arklow town consisting of two connected compounds:
 1. The transmission compound with the infrastructure to physically connect to the National Electricity Transmission Network (NETN), and
 2. The connection compound with the infrastructure to allow the connection of the windfarm in accordance with EirGrid grid code requirements.
- Flood defence improvement works to the existing Avoca River Park flood defences located approximately 500m west of the substation site;

- A 220kV overhead line connection from the new 220kV substation at Shelton Abbey to the existing 220kV national electricity transmission network (NETN).

This is detailed further in **Chapter 5** *Description of Development*.

The following is noted in terms of the characteristics of the proposed development, in respect of its design, construction and operation:

- **Design:** The proposed development has been designed in line with good industry practice and where relevant EirGrid's functional specifications which have incorporated health and safety considerations.
- **Operation:** The operational phase of proposed development will be managed to minimise the risk of major accidents occurring. Information on maintenance and management of the proposed development is outlined in **Chapter 5** *Description of Development*.
- **Construction:** The construction phase of the proposed development will be carried out in accordance with all relevant health and safety guidance and legislation, as well as the provisions of the Construction Environmental Management Plan (CEMP) (see **Appendix 6.1** of **Volume 3**).

19.5 Risk Assessment

This section outlines the possible risks associated with the proposed development for the construction, operation and decommissioning

These risks have been assessed in accordance with the relevant classification (refer to **Table 19.2** and **Table 19.3**).

As outlined in **Section 19.2.6**, the consequence rating assigned to each potential risk assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster.

19.5.1 Potential Effects During Construction

A risk register has been developed which contains all potentially relevant risks identified during the construction phase of the proposed development. These are presented in **Table 19.6**.

Based on the understanding that the construction phase of the proposed development will be carried out in accordance with construction good-practice, all relevant health and safety guidance and legislation, the mitigation measures outlined in this EIAR, as well as the provisions of the CEMP (**Appendix 6.1** of **Volume 3**), a number of the potential risks identified have not been made subject to further assessment for the purposes of this chapter. Where potential risks are not identified for further assessment, a statement as to why is included in **Table 19.6**.

Table 19.6: Risk Register - Construction

Risk ID	Potential Risk	Possible Cause	Requirement for further assessment?
Potential vulnerability to accidents and/or disasters			
A	Flooding of site/ working areas during construction works	Periods of extended rainfall	No. The potential for the proposed development to be affected by flooding during construction is considered in Chapter 10 Water and in the CEMP, which includes the appropriate surface water management measures, see Appendix 6.1 of Volume 3 . The Flood Risk Assessment assesses the potential for the proposed substation site to be affected by flooding (see Appendix 10.1 of Volume 3). It concludes that, the necessary measures will be taken to ensure protection to the appropriate standard.
Potential to cause major accidents and/or disasters			
B	Cliff collapse during Horizontal Directional Drilling	Contractor error	Yes.
C	Traffic accidents resulting from construction phase traffic or temporary construction traffic management measures	<ul style="list-style-type: none"> • HGVs navigating roundabouts and rural roads • Machinery navigating at watercourse crossings and slopes • Driver error- not abiding by traffic re-routing or road closures 	No. The construction phase of the proposed development will be carried out in accordance with good practice construction methodologies, all relevant health and safety guidance and legislation, as well as the provisions of the CEMP, including the Construction Traffic Management Plan (CTMP) therein, see Appendix 6.1 of Volume 3 .
D	Contamination of the groundwater/ surface water	<ul style="list-style-type: none"> • Spill or leakage of oils or hydrocarbons from construction machinery and vehicles • Accidental spillages or run off during open-cut trench construction methods through watercourses 	No. The construction phase of the proposed development will be carried out in accordance with good practice construction methodologies, all relevant health and safety guidance and legislation, as well as the provisions of the CEMP, including the surface water management measures, see Appendix 6.1 of Volume 3 .

Risk ID	Potential Risk	Possible Cause	Requirement for further assessment?
E	Falling debris from construction vehicles or scaffolding	Contractor error	No. The construction phase of the proposed development will be carried out in accordance with good practice construction methodologies, all relevant health and safety guidance and legislation, as well as the provisions of the CEMP, see Appendix 6.1 of Volume 3 .
F	Sinking/flooding of plant or machinery in watercourse crossings	<ul style="list-style-type: none"> • Unsuitable ground conditions/contractor error in construction of temporary causeways • Flash flooding • Failure of dam for over-pump 	No. The construction phase of the proposed development will be carried out in accordance with good practice construction methodologies, all relevant health and safety guidance and legislation, as well as the provisions of the CEMP, see Appendix 6.1 of Volume 3 .
G	Gas explosion	<ul style="list-style-type: none"> • Interaction with unknown gas infrastructure • Contractor error at gas pipeline crossing 	Yes
H	Bentonite spillage (frac-out)	Contractor error	Yes
I	Contamination of ground or surface water at the proposed substation site due to the contaminated material	Heavy rain during construction activities	No. The construction phase of the proposed development will be carried out in accordance with good practice construction methodologies, the remediation strategy as outlined in Chapter 6 Construction Strategy , all relevant health and safety guidance and legislation, as well as the provisions of the CEMP, including the surface water management measures, see Appendix 6.1 of Volume 3 .
J	Electrical shock	<ul style="list-style-type: none"> • Faulty equipment or procedures • Contractor error 	No. The construction phase of the proposed development will be carried out in accordance with good practice construction methodologies, all relevant health and safety guidance

Risk ID	Potential Risk	Possible Cause	Requirement for further assessment?
			and legislation, as well as the provisions of the CEMP, see Appendix 6.1 of Volume 3.
K	Fire and/or explosion, with a secondary impact of fire water/foam/powder reaching nearby receptors (e.g. watercourse, groundwater, soil)	<ul style="list-style-type: none"> • Spill or leak of flammable or explosive substance • Electrical fault or faulty equipment • Vehicle collision • Employee negligence 	Yes
L	Dropped objects during the proposed OHL tower construction and restringing	Contractor error	No. The construction phase of the proposed development will be carried out in accordance with good practice construction methodologies, all relevant health and safety guidance and legislation, as well as the provisions of the CEMP, see Appendix 6.1 of Volume 3.
M	Trench collapse during construction works along the proposed cable route	<ul style="list-style-type: none"> • Inadequate procedures • Contractor error 	No. The construction phase of the proposed development will be carried out in accordance with good practice construction methodologies, all relevant health and safety guidance and legislation, as well as the provisions of the CEMP, see Appendix 6.1 of Volume 3.

The potential construction phase risks identified for further assessment include: B ‘Cliff collapse during Horizontal Directional Drilling’, G ‘Gas explosion’, H ‘Bentonite spillage (frac-out)’, and K ‘Fire and/or explosion, with a secondary impact of fire water/foam/powder reaching nearby receptors.’

19.5.2 Potential Effects during Operation

A risk register has been developed which contains all potentially relevant risks identified during the operational phase of the proposed development. These are presented in **Table 19.7.**

As the proposed development will be designed, constructed and operated in line with good industry practice, and will be compliant with all relevant Health and Safety and Fire regulations and guidance, as well as the mitigation measures

outlined in this EIAR, a number of the potential risks identified have not been made subject to further assessment for the purposes of this chapter. Where potential risks are not identified for further assessment, a statement as to why is included in **Table 19.7**.

Table 19.7: Risk register - Operation

Risk ID	Potential Risk	Possible cause	Requirement for further assessment?
Potential vulnerability to accidents/ disasters			
N	Flooding of site	Periods of extended rainfall	No. The potential for the proposed development to be affected by flooding during operation is considered in Chapter 10 Water and Chapter 8 Climate . The Flood Risk Assessment assesses the potential for the proposed substation site to be affected by flooding, see Appendix 10.1 of Volume 3 . The necessary flood defences are incorporated into the design of the proposed development.
O	Incident at nearby SEVESO site resulting in off-site environmental effects	Operational error	Yes
Potential to cause accidents and / or disasters			
P	Public safety along in open space.	<ul style="list-style-type: none"> Human error/accident-slipping/falling Acts of crime 	No. The potential for the proposed development to negatively affect the population and users of the proposed development is considered in Chapter 18 Population and Human Health .
Q	Sulphur Hexafluoride Substantial Leak	<ul style="list-style-type: none"> Faulty equipment Contractor error 	Yes
R	Fire and/or explosion, with a secondary impact of fire suppressant powder reaching nearby receptors (e.g. watercourse, groundwater, soil)	<ul style="list-style-type: none"> Equipment or infrastructure failure Employee negligence 	Yes
S	Collapse/damage to structures/	<ul style="list-style-type: none"> Earthquake Vehicular collision Severe weather 	Yes

Risk ID	Potential Risk	Possible cause	Requirement for further assessment?
	infrastructure at substation site		
T	Electrical shock	<ul style="list-style-type: none"> Faulty equipment or procedures Contractor error 	Yes
U	Cable or joint/termination failure	<ul style="list-style-type: none"> Internal fault Third party damage 	Yes
V	Damage to the substation or OHL towers by malicious intent	Intrusion by members of the public with malicious intent	No. The appropriate security measures and fencing will be implemented to prevent unwarranted access. This is detailed in Chapter 5 Description of Development .
W	The build-up of ground gas at the substation site	Inadequate/inappropriate site remediation works	No. There is low risk of ground gas at the substation site, and the made ground will be sealed and vented as per the substation site remediation strategy, ensuring build-up of gas is minimised during operation.

The potential operational phase risks identified for further assessment include: O ‘Incident at nearby SEVESO site resulting in off-site environmental effects,’ Q ‘Sulphur hexafluoride leak,’ R ‘Fire and/or explosion, with a secondary impact of fire suppressant powder reaching nearby receptors,’ S ‘Collapse/damage to structures/infrastructure at substation site,’ T ‘Electrical shock’ and U ‘Cable or joint/termination failure.’

These risks have been assessed in accordance with the relevant classification (refer to **Table 19.2** and **Table 19.3**) and the resulting risk analysis is given in **Table 19.10**.

The risk register is based upon possible risks associated with the proposed development. As outlined in **Section 19.2.7**, the consequence rating assigned to each potential risk assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster.

19.5.3 Decommissioning

The risk register and subsequent risk assessment, described for the construction phase, updated to reflect best practice at the time, will be implemented for the decommissioning phase.

Table 19.8: Risk Assessment

Risk ID	Potential Risk	Possible cause	Environmental effect	Likelihood Rating	Consequence Rating	Risk Score (Consequence x Likelihood)
Construction						
Potential to cause major accidents and/or disasters						
B	Cliff Collapse HDD	Contractor error	Damage to sensitive ecosystems. Loss of biodiversity. Threat to property and life.	2	2	4
<p>Basis of Likelihood: The occurrence of cliff collapse from HDD is considered ‘very unlikely’ to occur in that it ‘it is not expected to occur’, as the HDD design at the landfall has ensured an appropriate depth of cover to minimise the risk of cliff collapse.</p> <p>Basis of Consequence: Should a cliff collapse occur, the consequence is considered ‘limited’ in that the nearest dwelling is located c. 700m from the landfall site, the nearest ecological sensitive site (Buckroneys-Brittis Dune and Fen SAC) is located c. 320m from the landfall site and the beach is inaccessible to the public resulting in limited effects to population and human health, and biodiversity.</p>						
G	Gas Explosion	<ul style="list-style-type: none"> Interaction with unknown gas infrastructure Contractor error at gas pipeline crossing 	Human injury or loss of life.	1	4	4
<p>Basis of Likelihood: Detailed utilities surveys of the study area have been undertaken in order to identify the presence and location of existing utilities, including existing gas mains. All works will be carried out in compliance with a Gas Networks Ireland (GNI) approved Method Statement and the GNI Code of Practice for: Working in the Vicinity of the Transmission Network. As such, an ‘extremely unlikely’ risk is identified.</p> <p>Basis of Consequence: In the event of a gas explosion, a ‘very serious’ consequence is predicted in that there is potential for fatalities to occur, and the community would be functioning poorly, with limited services available to them.</p>						
H	Bentonite spillage (frac-out)	Contractor error	Damage to sensitive ecosystems Contamination of surface water or nearshore at the landfall Damage to, or depletion of habits and species	3	1	3

Risk ID	Potential Risk	Possible cause	Environmental effect	Likelihood Rating	Consequence Rating	Risk Score (Consequence x Likelihood)
<p>Basis of Likelihood: The occurrence of bentonite spillage (frac-out) is considered ‘unlikely’ to occur in that it ‘it may only occur at some time’ during the HDD works as the annular pressures will be within acceptable limits for the ground conditions and measures will be taken by the contractor to reduce the risk of bentonite breakout.</p>						
<p>Basis of Consequence: Should bentonite spillage (frac-out) occur the consequence is considered minor as bentonite is non-toxic and the contractor will ensure measures are taken for the protection of sensitive ecological receptors should a breakout occur, ensuring the spillage is controlled and therefore minimising the potential for contamination. Bentonite dissipates very quickly in sea water should frac-out occur at the landfall. The response to a bentonite spillage is outlined in the Environmental Incident & Emergency Response Plan in the CEMP (see Appendix 6.1 of Volume 3).</p>						
K	Fire and/or explosion, with a secondary impact of fire water/foam/powder reaching nearby receptors (e.g. watercourse, groundwater, soil)	<ul style="list-style-type: none"> • Spill or leak of flammable or explosive substance • Electrical fault or faulty equipment • Vehicle collision • Employee negligence 	Damage to, or depletion of habitats and species Contamination of groundwater and soils Effects on air quality Human injury or loss of life	2	3	6
<p>Basis of Likelihood: A fire and/or explosion during the construction phase is considered ‘very unlikely’ as the quantities of flammable or explosive materials on site, which could leak or spill, during the construction phase will be very limited, and will be confined to the construction compounds and substation site. In any areas with electrical equipment, or hydrocarbons, water will not be used for firefighting. The Developer will ensure that all contractor’s staff have been trained in safe working procedures.</p>						
<p>Basis of Consequence: Should a fire and/or explosion occur, a significant number of people in close proximity to the area could be affected. Contamination of surface water, groundwater, air and soils could occur. A ‘serious’ consequence is predicted in that there would be widespread effects for an extended duration.</p>						
<p>Operation</p>						
<p>Potential vulnerability to accidents/ disasters</p>						
O	Incident at nearby SEVESO site resulting in	Operational error	Damage to sensitive ecosystems Effects on air quality Loss of biodiversity	1	3	3

Risk ID	Potential Risk	Possible cause	Environmental effect	Likelihood Rating	Consequence Rating	Risk Score (Consequence x Likelihood)
	off-site environmental effects		Threat to property and life			
<p>Basis of Likelihood: The closest ‘Seveso site’ to the proposed development is the Sigma Aldrich facility at Vale Road, Arklow. The proposed development is within the 1000m consultation buffer. Having regards to the sites Annual Environmental Reports (AER’s) for the previous 5 years, it is clear that any incidents that have been reported at the site in previous years have been minor in nature. The possibility of an incident occurring that will result in a significant negative impact on the proposed development, resulting in a major accident and/or disaster is considered ‘extremely unlikely’ in that it ‘may occur only in exceptional circumstances; once every 500 or more years’</p> <p>The Sigma Aldrich facility is a lower tier Seveso site and the COMAH Regulations require the facility to prepare an Internal Emergency Plan which details both the systems that exist to deal with various emergencies and the response expected. The site is also required to prepare a safety report and major accident prevention policy and is subject to regular inspections from the Health and Safety Authority.</p> <p>According to the site’s Environmental Liabilities Risk Assessment (ELRA), the facility is well managed in terms of environmental controls. Risks that were identified as ‘high severity’ risks were identified to occur on a low to infrequent basis as a result of the management and design of the site, thus resulting in an overall low risk score.</p> <p>Having regard to the mechanisms in place to mitigate and avoid any major accident or incident at the Sigma Aldrich site, the comprehensive range of emergency response procedures in place in the event of these occurring, as well as the outcome of the sites ELRA, it is considered that the likelihood of a major incident occurring at the Sigma Aldrich facility which will significantly impact the proposed development will be ‘extremely unlikely.’</p> <p>Basis of Consequence: According to the Health and Safety Authority, ‘major industrial accidents involving dangerous substances pose a significant threat to humans and the environment; such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. In Europe, a catastrophic accident in the Italian town of Seveso in 1976 prompted the adoption of legislation on the prevention and control of such accidents’.</p>						
Q	Sulphur Hexafluoride (SF6) Substantial Leak	Faulty equipment Contractor error	Effects to air quality and climate. Significant global warming effects	2	2	4
<p>Basis of Likelihood: A substantial SF6 leak during the operational phase is considered ‘very unlikely’. The design and manufacture of the equipment follows industry best practice to contain the gas and complies with relevant standards. The switchgear will be equipped with a pressure or density monitoring device. Staff or any sub-contractors involved in equipment installation, servicing or disposal will be trained to ensure they understand the techniques required to minimise the generation of fugitive emissions and avoid large quantities leaking.</p> <p>Basis of Consequence: SF6 is listed under Section 3 of Annex 1 of the European F-Gas Regulations 2015. SF6 is also listed as a GHG and, according to the Intergovernmental Panel on Climate Change (IPCC), it is the most potent GHG that has been tested with a greenhouse gas potential 23,000 times higher than that of carbon dioxide.</p>						

Risk ID	Potential Risk	Possible cause	Environmental effect	Likelihood Rating	Consequence Rating	Risk Score (Consequence x Likelihood)
<p>However, should a substantial leak occur the amount of SF6 emitted is not expected to be significant considering the small scale of the proposed development relative to the scale that would be required in order to have a significant effect to global climate. Current SF6 emissions from electrical equipment makes up only 0.026% of Ireland’s total emissions (EPA, 2020). Therefore, the resultant consequence of a substantial SF6 leak is expected to be limited.</p>						
R	Fire and/or explosion, with a secondary impact of fire suppressant powder reaching nearby receptors (e.g. watercourse, groundwater, soil)	<ul style="list-style-type: none"> Equipment or infrastructure failure Employee negligence 	Damage to sensitive ecosystems Effects of air quality Loss of biodiversity Threat to property and life.	2	3	6
<p>Basis of Likelihood: A fire and/or explosion during the operational phase is considered ‘very unlikely’. The potential risk relates primarily to the substation. Such an event is extremely unlikely along the cable route. Prior to commissioning the contractor will be required to ensure that all fire safety detection equipment and systems have been designed and installed to good industry practice.</p> <p>Basis of Consequence: Should a fire and/or explosion occur, very few people will be affected as, there will only be occasional maintenance staff at the substation site but there could be more than one fatality. Should this event occur it would likely result in simple contamination with limited effect and duration. Should contamination of soil occur, there would be localised effects of short duration, which could be remediated.</p>						
S	Collapse/damage to structures/ infrastructure at substation site	<ul style="list-style-type: none"> Earthquake Vehicular collision Sever weather 	Human injury or loss of life.	1	2	2
<p>Basis of Likelihood: According to the Irish National Seismic Network (INSN), earthquakes measuring ~2 on the Richter Scale are ‘normal’ in terms of seismicity in Ireland. These are known as microearthquakes; they are not commonly felt by people and are generally recorded only on local seismographs. With events of this magnitude buildings in Ireland are extremely unlikely to be damaged or collapse due to seismic activity. Having regard to on-site speed restrictions and infrequent vehicular movements at the substation site, it is not predicted that any collision of vehicles with the structures on site would result in significant damage/collapse. It is considered ‘extremely unlikely’ that severe weather would cause significant damage or collapse of the structures on site, even allowing for climate change effects.</p> <p>Basis of Consequence: In the event of a structural damage, a limited effect would occur in that a very small number of people would be affected with a few serious injuries with hospitalisation and medical treatment likely to be required. For normal operations there will only be occasional maintenance staff on site.</p>						

Risk ID	Potential Risk	Possible cause	Environmental effect	Likelihood Rating	Consequence Rating	Risk Score (Consequence x Likelihood)
T	Electrical Shock	<ul style="list-style-type: none"> Faulty equipment or procedures Contractor error 	Human injury or loss of life	2	2	4
<p>Basis of Likelihood: The risk of electrical shock during the operation of the proposed development is considered extremely unlikely. The potential risk relates primarily to the substation site. Prior to commissioning, the contractor will be required to ensure that all the equipment and systems have been designed and installed to good industry practice, as per EirGrid specification, and all operators completing maintenance will operate under Operational Safety Rules so the risk of shock is minimal.</p> <p>Basis of Consequence: Very limited workforce exposed to the hazard. There will be only occasional maintenance staff on the substation site during operation. The inspection and maintenance crews will be small.</p>						
U	Cable or joint / termination failure	<ul style="list-style-type: none"> Internal fault Third party damage 	Human injury or loss of life.	2	2	4
<p>Base of Likelihood: Cable/joint failure due to an internal fault is considered ‘very unlikely’ following good industry practice, manufacturing and installation. The most likely cause for a cable failure would be due to third party damage. The cables will be marked with warning tape, placed above the cables in the trench, and the cable route will be marked with above ground marker posts, in accordance with best industry practice.</p> <p>Basis of Consequence: Should an electrical shock occur a limited effect is predicted in that a limited number of people would be affected with a few serious injuries with hospitalisation and medical treatment likely to be required, with the possibility of fatalities.</p>						

This risk assessment in **Table 19.9** categorises each of the potential risks by their ‘risk score’. A corresponding risk matrix is provided in **Table 19.10** which is colour coded in order to provide an indication of the critical nature of each risk. As outlined in **Section 19.2.6.2**, the red zone represents ‘high risk scenarios’, the amber zone represents ‘medium risk scenarios’ and the green zone represents ‘low risk scenarios.’

Table 19.9: Risk Scores

Risk ID	Potential Risk	Likelihood Rating	Consequence Rating	Risk Score
Construction Phase				
B	Cliff collapse HDD	2	2	4
G	Gas Explosion	1	4	4
H	Bentonite Spillage	3	1	3
K	Fire and/or explosion	2	3	6
Operational Phase				
O	Incident at nearby SEVESO site	1	3	3
Q	Sulphur Hexafluoride substation leak	2	2	4
R	Fire and/or explosion	2	3	6
S	Collapse or damage to structures	1	2	2
T	Electric Shock	2	2	4
U	Cable/joint termination failure	2	2	4

Table 19.10: Risk Matrix

Likelihood Rating	Very likely	5					
	Likely	4					
	Unlikely	3	H				
	Very unlikely	2		B, Q, T, U	K, R		
	Extremely Unlikely	1		S	O	G	
			Minor	Limited	Serious	Very Serious	Catastrophic
			1	2	3	4	5
			Consequence Rating				

19.6 Likely Significant Effects

19.6.1 Do-Nothing Scenario

In the do-nothing scenario, the potential risk of the proposed development causing, or being affected by a disaster and/or major accident would be eliminated as the proposed development would not be implemented.

Thus, the do-nothing scenario for the proposed development will result in no change to the existing situation for the risk of major accidents/disasters in Arklow.

19.6.2 Construction Phase

From an examination of the plausible risks presented in **Table 19.8**, the scenario with the highest risk score in terms of a major accident and/or disaster during the operational phase of the proposed development was identified as being ‘Fire and/or explosion.’

The risk of fire and/or explosion during the construction phase was given a risk score of 2 indicating a scenario that is ‘very unlikely’ to occur, and which would have ‘serious’ consequences should it do so. According to the risk matrix provided in **Table 19.10**, this is indicative of a ‘low risk scenario.’

19.6.3 Operational Phase

From an examination of the plausible risks presented in **Table 19.8**, the scenario with the highest risk score in terms of a major accident and/or disaster during the operational phase of the proposed development was identified as being ‘Fire and/or explosion.’

The risk of fire and/or explosion during the operational phase was given a risk score of 2 indicating a scenario that is ‘very unlikely’ to occur, and which would have ‘serious’ consequences should it do so. According to the risk matrix provided in **Table 19.10**, this is indicative of a ‘low risk scenario.’

19.6.4 Indirect Effects

By their nature, major accidents and/or disasters have the potential to give rise to indirect effects such as effects on the economy, tourism, transport, human health etc.

As outlined in **Section 19.5.2**, no likely significant risks of a major accident/disaster occurring are identified in respect of the proposed development. Thus, no significant indirect effects are identified.

19.7 Mitigation Measures and Monitoring

19.7.1 Construction Phase

The proposed development will be designed and constructed in line with good industry practice, and where required as per EirGrid specification and, as such, mitigation against the risk of major accidents and/or disasters will be embedded through the design.

As outlined in **Chapter 6 Construction Strategy**, an Environmental Incident & Emergency Response Plan has been prepared, and will be further updated prior to construction, covering all foreseeable risks during the construction stage, including fire, flood, collapse as well as accidental spills and releases of hazardous substances. Appropriate site personnel will be trained as first aiders and fire marshals. Further information on the Environmental Incident and Emergency Response Plan is presented in the CEMP (see **Appendix 6.1 of Volume 3**).

The bentonite drilling fluid is non-toxic and can be commonly used in farming practices. If sufficient quantity enters a watercourse or the nearshore environment at the proposed landfall, it can have a potential direct effect on flora and fauna including smothering benthic flora and affecting faunal feeding and breeding sites. Refer also to **Chapter 12 Biodiversity**

The proposed procedure for managing a breakout or frac-out on land is outlined in **Chapter 6 Construction Strategy** and the CEMP (**Appendix 6.1 of Volume 3**). This will be further developed by the Contractor, prior to construction, into a location specific HDD frac-out contingency plan, detailing measures to be taken to reduce the risk of bentonite breakout and measures to be taken for the protection of sensitive ecological receptors, should a breakout occur.

As outlined in **Section 19.6.2**, the scenario with the highest risk score in terms of a major accident and/or disaster during the construction phase was identified as ‘fire and/or explosion’, with a secondary effect of ‘fire water/foam/powder reaching nearby receptors’.

The mitigation measures, which will limit the likelihood and consequence of a fire or explosion, will include:

- The storage of fuels and oils in contained and banded areas, with quantities stored being limited to the minimum volume required to meet the immediate requirements. This will mitigate, by prevention, the risk of fire/explosion resulting from the potential spillage of fuels or oils.
- Portable fire extinguishers will be available for use at each of the onshore working areas.
- Appropriate site personnel will be trained as first aiders and fire marshals.
- Monitoring of site activities to minimise fire and explosion risk will be a key part of the duties of the site safety officer and fire marshals.

19.7.2 Operational Phase

The proposed development will be operated in line with industry good practice as described in **Chapter 5 Description of Development** and **Chapter 6 Construction Strategy** including operational management procedures implemented so as to minimise the risk of major accidents occurring. As such, mitigation against the risk of major accidents and/or disasters will be embedded through the operational procedures.

As outlined in **Section 19.6.3**, the scenarios with the highest risk score during the operational phase were a ‘fire and/or explosion’, with a secondary effect of ‘fire suppressant powder reaching nearby receptors.’

The mitigation measures, which will limit the likelihood and consequence of a fire or explosion, will include:

- The proposed development will comply with BS 9999 *Fire safety in the design, management and use of buildings*.
- A Fire Plan specific to the substation site will detail the pre-planned procedures in place for use in the event of a fire.
- Fire detection and alarm will be designed to BS 5839 Fire Detection and Alarm Systems for Buildings
- The buildings will be equipped with firefighting equipment that may aide safe evacuation in the event of a fire.
- Fire suppression systems will be fitted to all enclosed areas with equipment/plant containing oil unless it can be demonstrated at detailed design stage that it is safe not to do so.
- Cable routes and other holes through walls and floors will be designed to be capable of being fire sealed after installation of all equipment/plant and cables.
- Smoke detection will be provided throughout the substation building.

19.7.3 Decommissioning Phase

The mitigation and monitoring measures, described for the construction phase, updated to reflect best practice at the time, will be implemented for the decommissioning phase.

19.8 Residual Effects

The risk of a major accident and/or disaster occurring during either the construction or operational phases of the proposed development is considered low.

19.9 Cumulative Effects

This section considers the potential for cumulative effects arising from the proposed development in association with other developments. Specifically, it considers a worst-case scenario, where both the proposed development and the other developments for which timelines are not known are under construction at the same time.

A tiered approach to the cumulative assessment has been undertaken, in which the proposed development is considered cumulatively with other projects as follows:

Tier 1 -

- ABWP Phase 2 Offshore Infrastructure;
- ABWP Phase 2 Operations and Maintenance Facility (OMF);
- EirGrid Grid Upgrade Works; and
- Irish Water Upgrade Works.

Tier 2 -

- Other relevant projects currently under construction;
- Other relevant projects with consent;
- Other relevant projects in the planning process; and
- Other existing projects that were not operational when baseline data were collected.

There are a number of development proposals identified that are currently permitted or proposed in Arklow that were not assessed in this chapter. The nature and scale of these developments are such that development of these projects in combination with the proposed development would not give rise to significant effects with respect to major accidents and disasters.

A summary of the cumulative effects is given in **Chapter 21** *Summary of Cumulative Effects*.

19.9.1 Tier 1

19.9.1.1 Arklow Bank Wind Park Phase 2 Offshore Infrastructure and Operations and Maintenance Facility and Proposed Development

The EIAR for the Arklow Bank Wind Park Phase 2 Offshore Infrastructure describes the major accident and disaster risks from the offshore infrastructure works and the vulnerability of it to major accident and disaster risks. The EIAR also describes the measures in place to minimise these risks and mitigate their consequences.

Considering the distance between the proposed development, the Arklow Bank Wind Park Phase 2 Offshore Infrastructure and the Operations and Maintenance Facility, the potential low risk scenarios associated with the proposed development and the robust mitigation measures to be implemented for the proposed development and the offshore infrastructure works, no plausible potential major accidents and disasters have been identified, to which the proposed development together with the offshore infrastructure works and the Operations and Maintenance Facility will be vulnerable. The interface between the offshore and onshore infrastructure is the HDD at the landfall. There could be potential for cumulative effects in the vicinity of the High-Water Mark. However, the offshore works to seaward of the HDD will not increase the risks due to cliff collapse or bentonite spillage.

19.9.1.2 EirGrid Grid Upgrade Works and the Irish Water Upgrade Works and the Proposed Development

Considering the nature of the works required for the EirGrid grid upgrade works and the Irish Water watermain upgrade works and the potential low risk scenarios associated with the proposed development, no plausible potential major accidents and disasters have been identified, to which the proposed development together with the EirGrid and Irish Water watermain upgrade works will be vulnerable. The proposed development together with the EirGrid grid upgrade works and the Irish Water upgrade works is not expected to increase the risk of a major accident or disasters.

19.9.1.3 All Tier 1 Projects and Proposed Development

The Developer will ensure coordination between the Tier 1 projects. No potential incidents have been identified, which would result in the proposed development, together with the Tier 1 projects, causing a major accident or disaster on or outside the proposed development area during the construction or operational phase.

No major accidents and disaster risks have been identified, which would result in a cumulative increase in the vulnerability of the Tier 1 projects and the proposed development to major accidents and disasters.

No likely risks of a major accident/disaster occurring are identified in respect of the proposed development. Thus, no cumulative effects are identified for Tier 1 projects.

19.9.2 Tier 2

19.9.2.1 Introduction

Only the Tier 2 projects listed below were considered to have the potential for a cumulative effect with the proposed development with regard to the risk of, or the vulnerability to, a major accident or disaster.

19.9.2.2 Crag Digital Permitted Data Centre and Crag Digital Proposed Data Centre and the Proposed Development

Crag Digital Avoca Ltd (Planning Reference 18940) received planning permission for a data centre in the Avoca River Business Park adjacent to the proposed substation site.

A new application (Planning Reference: 201285) has been made by Crag Digital Avoca Ltd for the site of the permitted data centre, referred to above, which is adjacent to the proposed substation.

Both the permitted and the proposed development have one data hall, which is located on the proposed substation site. If either data centre development proceeds, this data hall will not be built.

During the construction phase there is potential for cumulative effects in relation to major accidents and disasters, due to the proximity to the proposed substation and the permitted data centre, on the assumption that there will be some overlap in the construction durations.

During the operational phase there is potential for cumulative effects to major accidents and disasters, considering the data centre's close proximity to the proposed substation.

There is potential for cumulative effects caused by gas explosion, fire and /or explosion for which the risks and consequences may be exacerbated due to the proximity of both developments.

While the EIAR for the permitted data centre did not include an assessment in relation to major accidents and disasters, the EIAR which accompanied the new data centre planning application identified the potential risk of fire from diesel storage or electrical equipment. This risk is mitigated, by the proposed firewater storage tank and pump house located on the site which would supply the water mist suppression system in the data halls, the sprinkler systems in the emergency generator and a ring main with hydrant connections covering all site areas (as included in the EIAR). A similar system will be implemented for the permitted data centre.

Due to the low likelihood of such an event occurring, the stringent protective measures in place for the proposed development, and the protective measures in place for both the permitted and the proposed Crag Digital Avoca Ltd data centres (as included in the EIAR); the potential for a significant cumulative effect to occur is low.

It is not expected that this will have any change to the cumulative effects, discussed above for the permitted data centre, in relation to major accidents and disasters should this new data centre application receive planning permission.

19.9.2.3 Crag Digital 110kV Substation, Permitted Data Centre and Proposed Development

An application (Planning Reference PL27.307256) has been made by Crag Digital Avoca Ltd for a 110kV substation on a site to the west of the proposed development substation. The 110kV substation has not yet been granted planning permission. It is assumed that there will be some overlap in the construction durations. Considering the close proximity of the three sites, there is potential for a cumulative effect in relation to major accidents and disasters during the construction phases of the proposed development, the 110kV substation and the permitted data centre facility. The cumulative effects identified for the permitted data centre and the proposed development have the potential to be further exacerbated, if the 110kV substation receives permission and is constructed at the same time.

Notwithstanding, due to the low likelihood of such an event occurring and the stringent protective measures in place for the proposed development, the potential for a cumulative effect of this nature to occur is very low.

The operational risks associated with the Crag Digital Avoca Ltd 110kV substation are considered similar to those of the proposed substation. Considering its close proximity and the proximity of the permitted data centre there is potential for cumulative effects during the operational phase caused by fire and /or explosion.

The risks and consequences may be exacerbated due to facilities being side by side. If such an event were to occur at more than one facility at the same time the associated consequence would also be increased.

However, due to the low likelihood of such an event occurring and the stringent protective measures in place for the proposed development the potential for a cumulative effect of this nature to occur is low.

It is assumed that SF₆ gas will be utilised in the proposed 110kV substation, similar to the proposed development with the same potential to leak in small amounts.

The proposed Crag Digital Avoca Ltd datacentre (amended application) EIAR notes the use of SF₆ and concludes a leak is not considered a significant major accident.

Consequently, considering the stringent mitigation measures in place for the proposed development and the imperceptible overall effects to climate from a single leak, no significant cumulative effects have been identified which would result in the proposed development, together with the Crag Digital 110kV substation and the Crag Digital Avoca Ltd datacentre causing major climate effects due to SF₆ leaks.

19.9.2.4 Developments within the vicinity of the Avoca River Business Park and the Proposed Development

There are other facilities within the vicinity of Avoca River Business Park which will potentially be under construction within similar time periods as the proposed development. These developments include:

- the permitted Rappel Enterprises Ltd office development (Planning Reference 138823) and
- the permitted Harmony Timber Solutions Ltd office and factory development (Planning Reference 1954).

Should these developments overlap with the developments described in **Section 19.9.2.2** and **Section 19.9.2.3** there is potential for a cumulative effect to traffic resulting in a major road accident. However, given the limited construction traffic associated with the proposed development and the implementation of the Construction Traffic Management Plan, which is included in the CEMP (**Appendix 6.1** of **Volume 3**), requiring the contractor to coordinate with the other construction projects in the area, no significant cumulative effects have been identified which would result in the proposed development, together with these projects being vulnerable to or causing a major road accident. This is detailed further in **Chapter 13 Traffic and Transport**.

19.9.2.5 Flood Defence Embankment Works in the Avoca River Business Park

There will be possible maintenance and repair works to the existing flood embankment around the Avoca River Business Park as part of a regular inspection, maintenance and repair programme, to manage residual risk of flooding from a potential breach of the embankment. Investigations are to be undertaken which will determine the nature and extent of any works required. Any required maintenance or reinforcement works, will be undertaken in advance of the substation construction, with ongoing maintenance and repair thereafter, subject to regular inspection and monitoring.

The inspection, maintenance and repair programme for the flood defence embankment at the Avoca River Business Park, in combination with the proposed development flood protection works will ensure that the Avoca River Business Park (including the proposed development) remain resilient to climate change, with protection to the 0.1% AEP 1 in 1000 years plus Mid-Range Future Scenario allowance for climate change as detailed in the Flood Risk Assessment (**Appendix 10.1 of Volume 3**). This will ensure that the Avoca River Business Park and the proposed development are protected from future flood events and as a result reduces the vulnerability of the proposed development to major accidents and disasters. This results in a positive effect to major accidents and disasters in terms of vulnerability.

No major accidents and disaster risks have been identified, which would result in a cumulative increase in the vulnerability of the flood defence works in the Avoca River Business Park and the proposed development to major accidents and disasters.

No likely risks of a major accident/disaster occurring are identified in respect of the proposed development. Thus, no cumulative effects are identified for the flood defence works in the Avoca River Business Park.

19.9.2.6 All Tier 2 and the Proposed Development

No major accidents and disasters have been identified, which would result in a cumulative increase in the vulnerability of the Tier 2 projects and the proposed development to major accidents and disasters.

19.10 References

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