

9.0 Major Accidents and Disasters

Introduction

9.1 This chapter of the Environmental Impact Assessment Report (EIAR) presents the assessment of predicted effects deriving from the risks of major accidents and/or disasters. The assessment is considered under two main scenarios:

- Where the proposed development may cause a major accident and/or disaster; and
- Where the proposed development is vulnerable to hazards resulting from a major accident and/or disaster.

9.2 Based on professional judgement, major accidents or disasters are events or situations that have the potential to affect the proposed development causing immediate or delayed serious damage to one or more of the following human health, welfare, and the environment. This assessment considers the risks of major accidents and disasters (hereafter referred to as major events) during construction and operation caused by natural hazards or manmade hazards (including operational failure).

9.3 The existing marina is located in the north of the town of Stranraer and is operated by the applicant, Dumfries and Galloway Council. An area of the marina is leased from Crown Estates. The proposed development consists of a series of upgrades and expansion works to the existing infrastructure at Stranraer Marina, to accommodate additional and larger vessels. The site of the proposed development will comprise of both land (terrestrial) and marine based development, including:

- Revised Marina layout – inclusion of up to an additional 185 new berths, in addition to the 45 existing berths, which gives a total of 230 berths (existing and proposed). It is considered that circa 14 of these berths will be for commercial use.

9.4 This chapter should be read in conjunction with other EIA Chapters to provide a broader environmental context on the risks associated with these major event types. These chapters also outline the proposed measures to prevent or mitigate significant effects and details of the preparedness for, and proposed response to emergencies.

Competency Statement

9.5 Stephen's experience is primarily in the field of Environmental Impact Assessment, specialising in major accidents and disasters assessment and various roles in senior project management. Stephen undertakes and coordinates a broad range of air quality, dust, lighting, odour and shadow flicker assessments and manages EIA projects from inception to completion. Stephen also has acted as an Expert Witness and environmental expert at various public inquiries and has provided specialist input into planning appeals, oral hearings and judicial review proceedings for both private and public sector clients. Stephen has a wealth of experience working on major infrastructure, energy, waste and brownfield/greenfield development projects in the UK and Ireland. He has undertaken survey and assessment of both large and small scale development proposals.

Legislation, Guidance and Policy

Introduction

- 9.6 The consideration of risk of major accident and/or disasters has followed the overall methodology and guidance relating to the EIA process and EIAR preparation as set out in Chapter 1 – Introduction & Background. Risk at both the construction and operational phases has been considered by way of a combination of desk-based studies, consultation, and collaboration with the relevant environmental and design specialists.

Legislative and Policy Framework

Legislation

- 9.7 The broad legislative and policy framework relevant to environmental assessment of the proposed development is set out in Chapter 4 Legislative and Planning Context. This section summarises the legislation, policy, and guidance applicable to the major events assessment.

The EIA Directive 2014/52/EU

- 9.8 The requirement to consider the vulnerability of a project (or Development) to either major accidents or disasters or both results from the 2014 amendment to the EIA Directive (2014/52)¹. The Directive requires:

“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.”

Reg 5(2) and (3) of the EIA Regs:

5(2) The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of the proposed development on the following factors —

(a) population and human health;

(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC(16) and Directive 2009/147/EC(17);

(c) land, soil, water, air and climate;

(d) material assets, cultural heritage and the landscape ; and

(e) the interaction between the factors referred to in sub-paragraphs (a) to (d).

¹ EIA Directive (2014/52)

(3) The effects referred to in paragraph (2) on the factors set out in that paragraph shall include—

(a) the operational effects of the proposed development, where the proposed development will have operational effects; and

(b) the expected effects deriving from the vulnerability of the proposed development to risks of major accidents or disasters that are relevant to the proposed development.

Schedule 4 para 5 of the EIA Regs –

5. A description of the likely significant effects of the development resulting from, inter alia:...

(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);...

The description of the likely significant effects on the factors specified in regulation 5(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development...

Schedule 4 para 8 of the EIA Regs:

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

Health and Safety at Work Act 1974²

9.9 The Health and Safety at Work etc. Act 1974 provides the framework for the regulation of workplace health and safety in the UK. It places general duties on employers, people in control of premises, manufacturers, and employees. The overriding principle is that foreseeable risks to persons will be reduced so far as is reasonably practicable and that adequate evidence will be produced to demonstrate that this has been done, including:

- Securing the health, safety, and welfare of persons at work.
- Protecting persons other than persons at work against risks to health or safety arising out of or in connection with the activities of persons at work.
- Controlling the keeping and use of explosive or highly flammable or otherwise dangerous substances, and generally preventing the unlawful acquisition, possession, and use of such substances.

² Health and Safety at Work Act 1974

Construction (Design and Management) Regulations 2015³

- 9.10 The Construction (Design and Management) Regulations 2015 (CDM 2015) came into force on 6 April 2015, replacing CDM 2007. This publication provides guidance on the legal requirements for CDM 2015 and is available to help anyone with duties under the Regulations. It describes:
- the law that applies to the whole construction process on all construction projects, from concept to completion
 - what each duty holder must or should do to comply with the law to ensure projects are carried out in a way that secures health and safety
- 9.11 CDM 2015 is subject to certain transitional provisions which apply to construction projects that start before the Regulations come into force and continue beyond that date.
- 9.12 Under the CDM Regulations, designers must avoid foreseeable risks so far as is reasonably practicable by: eliminating hazards from the construction, cleaning, maintenance, and proposed use and demolition of a structure, reducing risks from any remaining hazard, and giving collective safety measures priority over individual measures.

The Control of Major Accident Hazards (COMAH) Regulations 2015⁴

- 9.13 The principal aim of the regulations is to reduce the risks of potential major accidents involving dangerous substances, such as toxic substances (e.g. chlorine), flammable substances (e.g. liquefied petroleum gas), substances that are environmentally hazardous, and explosives.
- 9.14 If dangerous substances are used or stored at the site in quantities above certain thresholds, COMAH requires operators to take all measures necessary to prevent major accidents and limit the consequences for human health and the environment.
- 9.15 A major accident could involve a release of substance, fire or explosion resulting from uncontrolled developments involving one or more dangerous substance that causes serious danger to human health or the environment, whether immediate or delayed, inside or outside the site.
- 9.16 As part of Scotland's competent authority, it is Scottish Environment Protection Agency (SEPA's) duty to ensure that business and industry adhere to the regulations, and to investigate and report on any major incidents.

National Planning Policy Context

National Planning Framework 4 (NPF4)

- 9.17 Overarching planning policies for Scotland are contained within the 'National Planning Framework 4' (NPF4)⁵, which is a long-term plan looking to 2045 that guides spatial development, sets out national planning policies, designates national developments and

³ Construction (Design and Management) Regulations 2015

⁴ The Control of Major Accident Hazards Regulations 2015

⁵ Scottish Government: National Planning Framework 4: February 2023

highlights regional spatial priorities. It is part of the development plan, and so influences planning decisions across Scotland.

- 9.18 NPF4 was adopted by the Scottish Ministers on 13 February 2023, following approval by the Scottish Parliament in January. This replaces National Planning Framework 3 and Scottish Planning Policy.
- 9.19 NPF4 incorporates updated Scottish Planning Policy, containing detailed national policy on several planning topics. For the first time, spatial and thematic planning policies are addressed in one place.
- 9.20 The policy that closely aligns with this chapter is marked as being the Liveable Places Policy 23 with the intent:
- 9.21 *“To protect people and places from environmental harm, mitigate risks arising from safety hazards and encourage, promote and facilitate development that improves health and wellbeing.”*
- 9.22 *“(g) Development proposals within the vicinity of a major accident hazard site or major accident hazard pipeline (because of the presence of toxic, highly reactive, explosive or inflammable substances) will consider the associated risks and potential impacts of the proposal and the major accident hazard site/pipeline of being located in proximity to one another.”*

National and Regional Strategies

Defra (2011) ‘Guidelines for Environmental Risk Assessment and Management’⁶

- 9.23 The Defra (2011) ‘Guidelines for Environmental Risk Assessment and Management’ provide generic guidance for the assessment and management of environmental risks. A cyclical framework for risk management is provided which identifies four main components of risk assessment:
- Formulating the problem
 - Carrying out an assessment of the risk
 - Identifying and appraising the management options available
 - Addressing the risk with a risk management strategy

European Union Guidance 2017 - Environmental Impact of Project Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)⁷

- 9.24 The ‘European Union Guidance 2017 - Environmental Impact of Project Guidance on the preparation of the Environmental Impact Assessment Report’ provides useful guidance on the key changes from Directive 2011/92/EU as amended by Directive 2014/52/EU specifically Annex IV point 8. It states that two key considerations relating to major events emerge under the new directive:
- The Project’s potential to cause either accidents or disasters or both; and,

⁶ Defra (2011) ‘Guidelines for Environmental Risk Assessment and Management’

⁷ ‘European Union Guidance 2017 - Environmental Impact of Project Guidance on the preparation of the Environmental Impact Assessment Report’

- The vulnerability of the Project to either potential disasters or accidents or both.

9.25 The guidance goes on to state that, after risks have been identified and assessed, measures to control and manage their significant impacts should then be taken, to ensure compliance with existing minimum prevention standards, safety requirements, building codes and improved land use planning, as well as others. It also states that measures should be captured in a coherent risk management plan that also includes sufficient preparedness and emergency planning measures .

[Institute of Environmental Management and Assessment \(IEMA\), Major Accidents and Disasters in EIA: A Primer, September 2020⁸](#)

9.26 This primer from IEMA aims to increase appreciation of the major accidents and/or disasters EIA topic and its application. The document suggests an assessment methodology based on known current practice within the UK to date and identifies key terminology that can be used. It has been structured around a typical assessment approach and offers a proportionate method for considering major accidents and/or disasters through screening, scoping and assessment. Reference has been made to this document and the advice contained within in it in this Chapter.

[Local Policy and Guidance](#)

[Dumfries and Galloway Council Local Development Plan 2 \(LDP2\)⁹](#)

9.27 Dumfries and Galloway Councils second Local Development Plan (LDP2) covers all of Dumfries and Galloway; it provides the planning framework and guides the future use and development of land in towns, villages and the rural area. It also indicates where development, including regeneration, should happen and where it should not.

9.28 Although the LDP2 does not specify any guidance with a direct link to minimising a major accident hazard site, it does specify some mitigation in regard to flood risk in Policy IN7: Flooding and Development.

9.29 The avoidance principle is the most sustainable form of flood management, in accordance with the policy principle for managing flood risk of SPP and the Flood Risk Management (Scotland) Act 2009¹⁰. Where proposed development could lead to an unacceptable on-site or off-site flood risk¹¹, as defined by the Risk Framework in SPP, then it will not be permitted. Where a proposed development could lead to an unacceptable flood risk, it may be that a Flood Risk Assessment (FRA) is able to clarify to the satisfaction of the Council and SEPA that the level of risk both on and off site would be acceptable. For any site a Drainage Impact Assessment (DIA) may be required to ensure that surface water flows are

⁸ Institute of Environmental Management and Assessment, Major Accidents and Disasters in EIA: A Primer, September 2020

⁹ Dumfries and Galloway Council Local Development Plan 2

¹⁰ Flood Risk Management (Scotland) Act 2009

¹¹ Note: The meaning of 'flood risk' is from SPP. It is 'the combination of the probability of a flood and of the potential adverse consequences, associated with a flood, for human health, the environment, cultural heritage and economic activity'.

properly taken into account in the development design. Consideration should be given to pluvial flows¹² especially those which exceed the capacity of the proposed drainage systems. Design of development must avoid flood risk from exceedance flows¹³.

- 9.30 The policy approach for flooding and development follows the SPP (Scottish Planning Policy) and intends to avoid adding to flood risk. This means that community burdens are not increased and long term sustainability is supported. Dumfries and Galloway is fortunate in that there is more than sufficient land available to meet this objective.

¹² Pluvial flooding is a result of rainfall runoff flowing or ponding over the ground before it enters a natural drainage system (eg watercourse) or an artificial one (eg sewer) because for example the system is already full to capacity or the drainage inlets have limited capacity.

¹³ Those which exceed the capacity of any formal drainage system.

Methodology Used For Assessment

Introduction

- 9.31 The purpose of this Chapter is to identify predicted significant effects of the proposed development to the environment, which could derive from its vulnerability to risks of major accidents or natural disasters. These have been considered during the construction, operation and maintenance and decommissioning phases of the proposed development. A methodology was adopted to systematically identify potential risks, pathways for adverse effects to occur and suitable controls (for identified risks). This was broadly based on accepted technical risk assessment methods which allow the identification of risks, pathways, sensitive receptors and if required barriers / controls to mitigation risk to an acceptable level.

Consultation

- 9.32 An EIA Scoping Report (March 2021)¹⁴ setting out the proposed scope of the EIA for the proposed development was submitted to MS-LOT, and received in June 2021. In accordance with regulation 14 of The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (“2017 MW Regulations”), the Scottish Ministers issued their Scoping Opinion, (February 2023)¹⁵
- 9.33 The requests for an EIA Screening Opinion was submitted in accordance with the relevant requirements, as set out in The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.
- 9.34 Section 15 of the Scoping Report, titled ‘Major Accidents and Disasters,’ contains considerations of the potential impacts of the Proposed Works from accidental discharge of dangerous substances and navigation of safety.
- 9.35 The requests for an EIA Screening Opinion were issued in September 2020. Marine Scotland provided a response (dated 3rd February 2021). The main responses in terms of accidents and major disasters from Marine Scotland are as follows:

the Scottish Ministers advise that navigation and safety and risk of major accidents and/or disasters must be addressed as two separate receptors in the EIA Report,

the Scottish Ministers advise that navigation and safety and risk of major accidents and/or disasters must be addressed as two separate receptors in the EIA Report,

the Applicant should make use of appropriate guidance, including the recent Institute of Environmental Management and Assessment (“IEMA”) ‘Major Accidents and Disasters in EIA: A Primer’,

¹⁴ RPS Group: Environmental Impact Assessment Scoping Report – Stranraer Marina (March 2021)

¹⁵ Marine Scotland: Scoping Opinion adopted by the Scottish Ministers under Part 4 of The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 Dumfries and Galloway Council Stranraer Marina Development: February 2023

Study Area

- 9.36 For the purposes of the risk assessment, the study area includes the extent of the zone of Influence as defined in each of the specialist **Chapters 7 – 24**. Consideration has also been given to sites i.e. Seveso sites, also known as COMAH establishments, that have potential for major accident hazard under the COMAH Regulations 2015 (S.I. No. 209 of 2015)¹⁶. Within the EIA Directive 2014/52/EU, the proposed development's potential to cause accidents and/or disasters focuses on the impact to human health, cultural heritage and the environment. Environmental receptors are identified as those listed within Article 3¹⁷ of the EIA Directive.

Baseline conditions

- 9.37 A review was undertaken of baseline conditions to identify existing facilities or natural features or scenarios (such as flooding) which could lead to risk events with associated major accident or hazard in combination with the proposed development. These developments were then screened to identify if any specific risk events required further consideration. This process also identified those, which could be screened out as not having a significant risk to retained proportionality and focus within the assessment.

Impact Assessment Methodology

- 9.38 This assessment broadly applies the approach set out in Major Accidents and Disasters in EIA: A Primer (IEMA, 2020). Unlike other assessments within the EIAR, the assessment does not deal with likely effects. The scope of this assessment focuses on potential sudden events of low likelihood, which may reasonably occur, resulting in major negative impacts on receptors. This approach directs the assessment to focus on *“low likelihood but potentially high consequence events”* such as a major spill, explosion, fire etc. Smaller incidents (spills, sediment loss etc.) are addressed elsewhere in this EIAR in the relevant topic chapters. This chapter focuses on major events only.
- 9.39 Additionally, other Chapters of the EIAR, which typically apply the standard definitions provided within the EIA Guidelines, which describe 'significance' as *“...a concept that can have different meanings for different topics.”* However, in the context of Major Accidents and Disasters, the understanding of what constitutes a 'significant' effect or impact differs. The IEMA (2020) approach defines a *“significant environmental effect”* as one which *“could include the loss of life, permanent injury and temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration”* and this definition has been adopted for the purposes of this assessment.
- 9.40 The assessment then considered what activities could result in an adverse impact during construction / operation / decommissioning and what barriers or embedded mitigation are in place to prevent the source pathway receptor risk from occurring. Finally, the assessment sought to identify any 'escalation

¹⁶ COMAH Regulations 2015 (S.I. No. 209 of 2015)

¹⁷ identify, describe and assess the direct and indirect effects of the mining project on human beings, fauna, flora, soil, water, air, climate, landscape, material assets and cultural heritages

factors' which could compromise the integrity of embedded mitigation and therefore any significant residual risks and accordingly the need for further mitigation / monitoring.

- 9.41 This assessment does not explicitly consider the decommissioning stage of the proposed development on the basis that the assessment of construction stages effects (and the need for any mitigation) effectively forms a more conservative scenario.

Assessment Methodology

- 9.42 In accordance with the approach presented in the IEMA Primer (IEMA, 2020), this assessment follows three stages (screening, scoping, assessment) as follows:

- **Stage 1 Screening:** The IEMA Primer (2020) states that *“during screening it should be sufficient to identify if a development has a vulnerability to major accidents and / or disasters and to consider whether a development could lead to a significant effect.”*
- **Stage 2 Scoping:** Scoping is undertaken to determine in more detail whether there is potential for significant effects as a result of major accidents and/or disasters associated with the Proposed Scheme. If the Proposed Scheme is screened in for the assessment of impacts in relation to major accidents and/or disasters at Stage 1, Stage 2 aims to provide a more detailed determination as to whether there is potential for significant effects.

The IEMA Primer (2020) further states that the assessment of impacts in relation to major accidents and/or disasters may be scoped out if it can be shown that:

- *“There is no source-pathway-receptor linkage of a hazard that could trigger a major accident and/or disaster or potential for the scheme to lead to a significant environmental effect”;* or
- *“All possible major accidents and/or disasters are adequately covered elsewhere in the assessment or covered by existing design measures or compliance with legislation and best practice.”*

The Primer further notes that:

- *“A major accidents and/or disasters assessment will be relevant to some developments more than others, and for many developments it is likely to be scoped out of the assessment”.*
- **Stage 3 Assessment:** The assessment stage provides further understanding on the likelihood of a risk event occurring and identifies the requirement for further mitigation. If hazard types are screened in at Stage 2, they are brought forward to Stage 3 for detailed consideration of the potential for significant impacts to occur.

The following exercises are carried out in the Stage 3 Assessment:

- Setting out the baseline: Hazard identification and receptor tagging;
- Assessment:
 - Identifying reasonable worst-case impact;
 - Selecting the grouped risk events that need further assessment;

- Understanding the likelihood of a risk event occurring; and
- Mitigation: Identifying the requirements for secondary mitigation.

Sensitivity of Receptor

9.43 The environmental receptors are identified as those listed within Article 3 of the EIA Directive.

Magnitude of Impact

9.44 In the context of this Chapter, typical methods employed within EIA to define magnitude are not applicable. By definition, a major accident or disaster would be a significant effect on the environment. Accordingly, any risks that could result in a major accident or disaster without suitable mitigation, management or regulatory controls in place will be assessed as significant in EIA terms.

Significance of Effect

9.45 Following the steps undertaken in Stage 1 and Stage 2, the potential risk of identified hazards brought forward to the Stage 3 assessment are then evaluated using criteria outlined in Table 9-1 (likelihood of occurrence), Table 9-2 (consequence of impact) and Table 9-3 (risk assessment), which have been adapted from the following:

- National Risk Register 2023¹⁸ (Cabinet Office, 2023); and,
- Major Accidents and Disasters in EIA: A Primer (IEMA 2020).

¹⁸ <https://www.gov.uk/government/publications/national-risk-register-2023>

Table 9-1: Classification of Likelihood of Occurrence

Score	Percentage Change	PHIA Yardstick Designation
1	<0.2%	Remote chance (0-5%)
2	0.2-1%	
3	1-5%	
4	5-25%	Highly unlikely (5-25%)
5	>25%	Almost certain (95-100%) Highly likely (80-90%) Likely or probable (55-75%) Realistic probability (40-50%) Unlikely (25-35%)

Table 9-2: Consequence of Impact

Rating	Classification of Potential Impact (Cabinet Office, 2023)	Significance of Effects (IEMA 2020)	Description
1	Very Low Impact	Slight	Fatalities - 1-8 Casualties - 1-18 Economic cost - Millions of £
2	Low Impact	Moderate	Fatalities - 9-40 Casualties - 17-80 Economic cost - Tens of millions £
3	Moderate Impact	Significant	Fatalities - 41-200 Casualties - 81-400 Economic cost - Hundreds of millions £
4	High Impact	Very Significant	Fatalities - 201-1,000 Casualties - 400-2,000 Economic cost - Billions of £
5	Very High Impact	Profound	Fatalities - >1,000 Casualties - >2,000 Economic cost - Tens of Billions £

9.46 Hazards scoped in at Stage 2 are evaluated and categorised using a risk matrix, developed using the approach and information outlined in both the national risk assessment documents, provisions outlined in the IEMA Primer, and the National Risk Register 2023.

9.47 This matrix is used to determine the level of significance of each risk for each hazard scenario. Risks have been grouped in three categories outlined in **Table 9-3**; red refers to 'High Risk' scenarios that

have an assessment score between 15 and 25, orange refers to 'Medium Risk' scenarios that score between 8 and 12, and green refers to 'Low Risk' scenarios scoring between 1 and 6.

Table 9-3: Risk Matrix

	Consequence of Impact					
		1 – Slight	2 – Moderate	3 – Significant	4 – Very Significant	5 – Profound
Likelihood	5 – Very Likely	5	10	15	20	25
	4 – Likely	4	8	12	16	20
	3 – Unlikely	3	6	9	12	16
	2 – Very Unlikely	2	4	6	8	10
	1 – Extremely Unlikely	1	2	3	4	5

Limitations to Assessment

9.48 The data used is the most up to date publicly available information which can be obtained from the applicable data sources as cited (see section on 'Limitations to Assessment' for those chapters listed in Chapters 7 - 24). It is therefore considered that the data employed in the assessment is robust and sufficient for the purposes of the assessment presented. It is, considered that the information available provides a suitable basis for describing the baseline environment in relation to major accidents for EIAR purposes.

Baseline Conditions

Context

9.49 Major accident and disaster risks relevant to the baseline in the absence of the proposed development include incidents involving natural gas, extreme weather events, associated flooding, road traffic collisions and accidental spillages. Baseline 'without project' conditions are described in the relevant chapters as follows Chapter 10 Flood Risk, Chapter 11 Water Quality, Chapter 16 Transportation and Chapter 18 Climate Change and are not repeated in this chapter in full.

Baseline Conditions

9.50 A review was undertaken of baseline conditions to identify existing facilities or natural features or scenarios (such as natural gas or flooding) which could lead to risk events with associated major accident or hazard in combination with the proposed development. These developments were then screened to identify if any specific risk events required further consideration. This process also identified those, which could be screened out as not having a significant risk to retained proportionality and focus within the assessment.

9.51 The baseline assessment sought to identify features (or sources of risk) within the existing environment that could be sources for major accidents and hazards comprising:

- local features external to the order limits that contribute a potential source of hazard to the proposed development;
- existing infrastructure and the built environment;
- baseline major accident and natural disaster risks (that exist with or without the proposed development).

9.52 The wider EIA topic baselines have been used to consider sensitive receptors at risk from the effects of the proposed development deriving from its vulnerability to major accidents or disasters for instance:

- members of the public and local communities;
- the natural environment, including ecosystems, land and soil quality, air quality, surface and groundwater resources and landscape.

9.53 The main risk sources identified have been divided into the following categories:

- Existing infrastructure and facilities (on both how they may impact the proposed development and how the proposed development may impact them); and,
- Wider natural disaster and hazard risks – for instance flood risk.

Description of Existing Environment

9.54 The existing marina serves the southern end of Loch Ryan and has historically been one of the busiest ports in the region. The marina itself currently consists of dogleg quay, and a finger pontoon, which is used by smaller fishing vessels, excursions and recreational craft. The current marina has

approximately 70 berths over two locations within the harbour. One area is mainly set aside for commercial operators and there are 7 dedicated berths for visitors. The existing harbour also includes a number of larger commercial and fishing vessel berths against the harbour wall. Ferry terminals are also located north of the harbour in Cairnryan, giving access to the Clyde, the Solway, Isle of Man and the North Channel, and beyond to the Irish Sea.

- 9.55 Public access through the harbour and along the promenade is via the Coastal Walkway path, which forms part of the Rhins of Galloway Coast Path Core Path.
- 9.56 Vehicular access into this area is via an existing road, providing access to a public carpark, the West Pier and boat yard.
- 9.57 Using the LDP2, the location of the proposed development has been identified as being within the existing settlement overview policy STR.MU1 Stranraer Waterfront (13.17 hectares). A Masterplan has been adopted as planning guidance to the Plan and a detailed design and development brief has been published. They outline the type, design and layout of development that would be considered suitable on the site. Development should improve the relationship with the town centre by considering the existing street pattern, key views and pedestrian and cycle links.

COMAH Establishments

- 9.58 In Scotland, the COMAH Regulations 2015¹⁹ place an obligation on the operators of establishments that store, handle or process dangerous substances above certain thresholds to take all necessary measures to prevent major accidents and to limit the consequences for human health and the environment. Under the Regulations, a COMAH establishment may qualify as upper tier or lower tier, depending on the inventory of dangerous substances; sites that store, handle or process dangerous substances below a certain threshold do not qualify as establishments under the Regulations.
- 9.59 Lower Tier Establishment means an establishment where a dangerous substance is present in a quantity equal to or in excess of the quantity listed in the entry for that substance in *“column 2 of Part 1 or in column 2 of Part 2 of Schedule 1, but less than that listed in the entry for that substance in column 3 of Part 1 or in column 3 of Part 2 of Schedule 1, where applicable using the rule laid down in note 4 of Part 3 of that Schedule”*.
- 9.60 There are two COMAH establishments located in Dumfries and Galloway Council’s geographical jurisdiction; two Lower Tier site, outlined in **Table 9-4**.

¹⁹ COMAH Regulations 2015

Table 9-4: COMAH Establishments within Dumfries and Galloway Council

Name	Tier	Location	Approx. Distance from Proposed Development
Bladnoch Distillery Limited	Lower Tier	Bladnoch	43km
Kilco (International) Limited	Lower Tier	Lockerbie	138km

9.61 The nearest COMAH establishment in proximity to the proposed development is Bladnoch Distillery Limited. Bladnoch distillery is a Lowland single malt Scotch whisky distillery located at Bladnoch, near Wigtown, Dumfries and Galloway in south west Scotland. The distillery is situated on the banks of the River Bladnoch. It is one of six remaining Lowland distilleries, and is the most southerly whisky distillery in Scotland.

9.62 This establishment contains the following activities:

- Distillation;
- Maturation;
- Blending;
- packaging and/or storage;
- distribution of alcoholic beverages; and
- Manufacture of food products and beverages.

9.63 The hazard classification of relevant dangerous substances linked to this establishment is for flammable liquids and gases with the risk of either fire or explosion.

Offshore Infrastructure

9.64 There are no offshore gas pipelines directly linked to the proposed development location. The nearest is SNIP (Scotland to Northern Ireland Pipeline) which is 135 kilometres long and runs from Twynholm in Scotland to Ballylumford in Northern Ireland. The SNIP is owned by Premier Transmission Limited which is part of the Mutual Energy Ltd. group of companies. This pipeline runs south and west of Stranraer.

Onshore Infrastructure (Built Services)

9.65 There are no onshore gas utilities within close proximity to the proposed development. There are no overhead lines within the direct proposed development area, with the nearest being Medium Voltage 33kV Overhead Line infrastructure located to the east, south and west. One underground cable runs into the south eastern portion of the proposed development site. Located approximately 4km south west of the proposed development is North Rhins Wind Farm. This contains 11 turbines with an output of 22,000 kW, as shown within Figure 9-1.

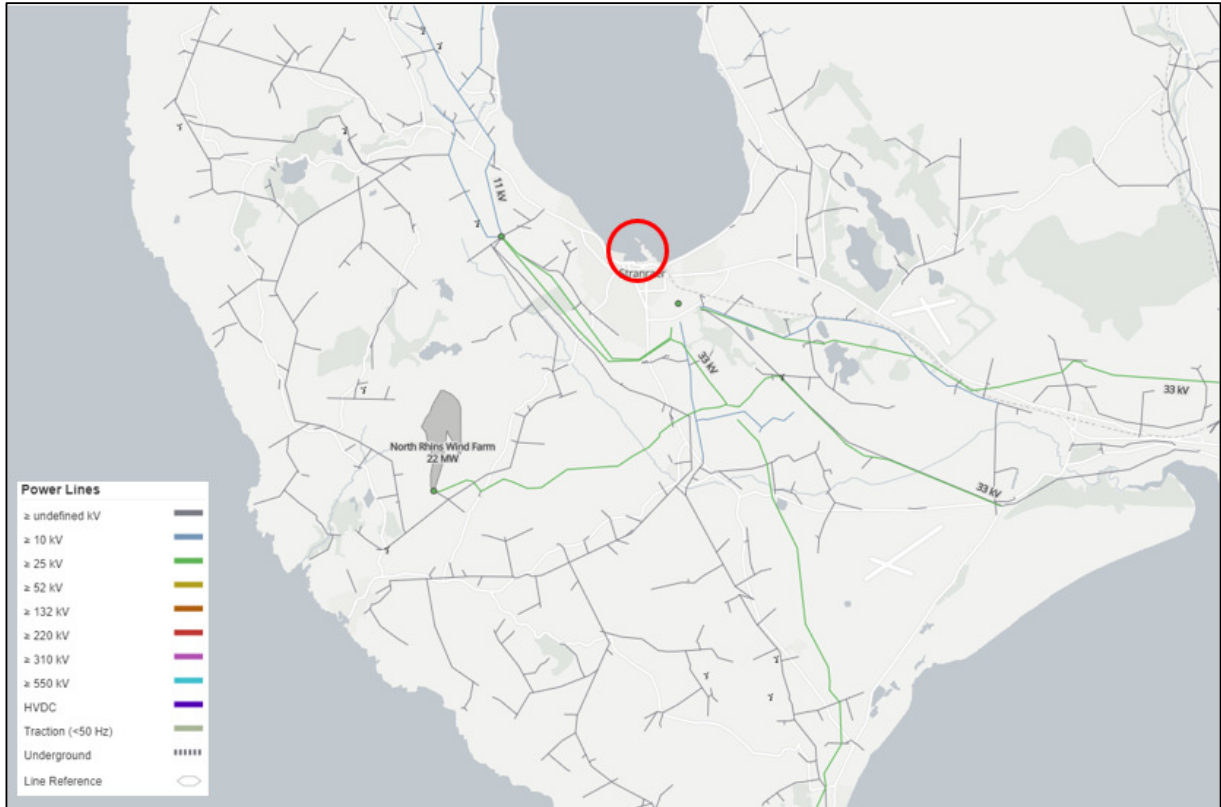


Figure 9-1: Power Generation Infrastructure in Close Proximity to Proposed Development (Site Location Highlighted in Red)²⁰

- 9.66 The proposed development is located within the vicinity of Scottish Pollutant Release Inventory (SPRI) establishment Port Rodie Pumping Station, Stranraer (license number CAR/S/1094806). This license was granted on 8th August 2011, for smaller industrial activities and marine discharges. The grading indicates discharge of effluent that exceeds 100 cubic metres per day.
- 9.67 Approximately 1.5km north east of the proposed development site is SPRI Establishment, The Creamery, Commerce Rd, Stranraer, Wigtown (license number PPC/A/1003173). This license was granted on 19th June 2007 for animal and vegetable products from the food and beverage sector, specifically PPC A: 6.8(e) - Treating and processing milk.

Shipping and Navigation

- 9.68 The existing marina serves the southern end of Loch Ryan and has historically been one of the busiest ports in the region. The marina itself currently consists of a dogleg quay, and a finger pontoon, which is used by smaller fishing vessels, excursions and recreational craft. The marina can provide 63 Annual Berths and 7 Berths for visitors. Ferry terminals are also located north of the harbour at Cairnryan,

²⁰ <https://openinframap.org/>

giving access to the Clyde, the Solway, Isle of Man and the North Channel, and beyond to the Irish Sea.

9.69 Located in the south of the Scottish west coast, Cairnryan has 2 ports. They are both located near the town of Stranraer, in the area of Dumfries and Galloway, and are an important link to Northern Ireland.

9.70 More specifically, in Cairnryan there is:

- The Loch Ryan Port is operated by Stena Line, linking Cairnryan to the port of Belfast
- The Cairnryan Port is operated by P&O Ferries, connecting the village with the port of Larne

9.71 The Stena Line linking Cairnryan to the port of Belfast is operated by the vessel MS Stena Superfast VII, which is a fast Ro-Pax ferry owned by Stena Line. The carrying capacity for this vessel is 1,200 passengers, 65 - 80 crew members (dependent on service requirements), 661 cars or 110 trailers (or a mix of both), 1924 lane metres and 5920 Deadweight tonnage.

9.72 The P&O Ferries linking Cairnryan to the port of Larne is operated by the vessel MV European Highlander, which is a ferry operated by P&O Irish Sea. The carrying capacity for this vessel is 410 passengers, 57 crew, 375 vehicles and 1,825 lane metres.

9.73 The Cairnryan – Belfast connection and Cairnryan – Larne connection both run with up to 6 crossings a day, with their timetables summarised below in Table 9-5.

Table 9-5: Cairnryan Ferry Terminal Timetable

Operator	Route	Departure	Arrival
Stena Line	Belfast - Cairnryan	03:30	05:52
		07:30	09:52
		11:30	13:52
		15:30	17:52
		19:30	21:52
		23:30	01:52
	Cairnryan - Belfast	03:30	05:45
		07:30	09:45
		11:30	13:45
		15:30	17:45
		19:30	21:45
		23:30	01:45
P&O Ferries	Larne - Cairnryan	04:00	06:00
		08:00	10:00
		12:00	14:00
		16:00	18:00

		20:00	22:00
		23:59	01:59
	Cairnryan - Larne	04:00	06:00
		08:00	10:00
		12:00	14:00
		16:00	18:00
		20:00	22:00
		23:59	01:59

Natural Hazards

- 9.74 The future baseline for major accidents and disasters will evolve along a number of factors over the proposed development lifecycle. The anticipated impact of climate change on environmental conditions is considered further in **Chapter 18 Climate Change**.
- 9.75 Climate change is predicted to lead to a number of changes including: an increase in peak rainfall intensities and resulting flood flows over time, with wetter winters and drier warmer summers; a rise in sea level. It is anticipated that there will be an increased frequency of lightning strikes and wind gusts. Climate change is expected to alter the prevalence of extreme weather conditions which could lead to disaster during different project phases (e.g. increased wind gusts impacting the construction phase or increased lightning strike frequency increasing risks during the operation and maintenance phase).
- 9.76 The magnitude of changes brought about by climate change is uncertain, but UK climate projections (UK CP18) are available until the end of the 21st century. A summary of projected changes to Scotland's climate is included in Figure 9-2. Sea level rise by 2100 relative to 1981-2000 could possibly increase between 8 – 49cm within the "Low Emission Scenario" and between 30 – 90cm within the "High Emission Scenario". The risk of coastal flooding from storm surges and high tides will increase as sea levels rise.

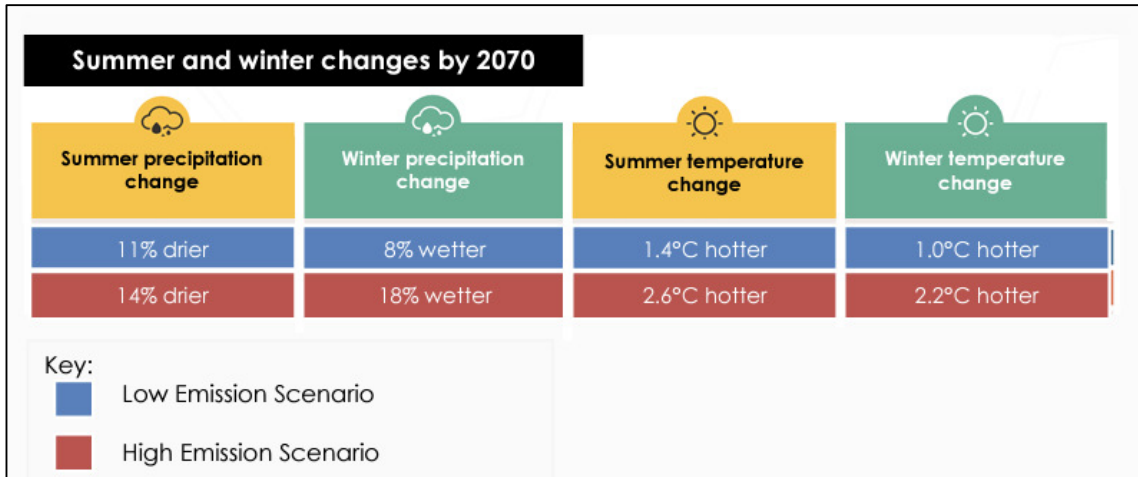


Figure 9-2: Summary of Projected Changes To Scotland's Climate²¹

- 9.77 The effects of climate change on anticipated weather conditions within the construction phase are anticipated to be minimal.
- 9.78 There could be changes in land or water use in the surrounding environment; water use and climate change factors could impact the local ecology and associated environmental designations. These changes are anticipated to be gradual in nature and as there is minimal potential for major accidents during the all project phases, this is unlikely to have a significant impact.
- 9.79 Scotland's geographic position means it is less vulnerable to extreme disasters and hazards such as earthquakes or tsunamis, which might pose risk to projects/schemes of this nature and scale in other locations. However, 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.
- 9.80 The effects of these weather events are wide ranging and include heavy rainfall resulting in flooding (pluvial, fluvial and coastal), damaging gusts due to violent winds, periods of extreme heat resulting in gorse fires, roads melting, hose pipe ban, impact on delivery of services, and extreme cold resulting in extreme frost conditions and heavy snowfall in locations across the county.
- 9.81 Substantial development of technology during the lifetime of the proposed development is anticipated. This could include advances in power generation, power transmission, and decommissioning/maintenance techniques. These may reduce the risk posed to safety and the environment further. However, changes in technology may also introduce new hazards that would need to be managed at the appropriate time and through the appropriate process.
- 9.82 The framework in place is based upon risk assessment and risk management principles which are flexible and adaptable to changing context and environmental factors but will ensure that the risk of major accidents and disasters is reduced as low as reasonably practicable.

²¹ Climate Ready Scotland: climate change adaptation programme 2019-2024

- 9.83 Other potential extreme natural hazards such as earthquakes, volcanoes, tsunamis, etc. are not relevant to the baseline hazard conditions in the vicinity of the Proposed Development.

Extreme Weather Events

- 9.84 Scotland has already experienced changes in climate, and these are projected to continue and intensify. Extreme weather is typically categorised as a weather event that significantly differs from usual or average weather patterns. The term “storm” is typically applied to severe atmospheric events, currently, however, there is no official meteorological definition.
- 9.85 Met Office records show that these events are becoming more frequent, with notable extreme events affecting Scotland during 2024 as outlined below within Table 9-6.
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Table 9-6: Met Office Records Extreme Weather Events within Scotland During 2024

Event	Date	Impact
Storm Lilian	23 August 2024	Storm Lilian brought travel disruption to parts of the UK on Friday, ahead of the bank holiday weekend. Tens of thousands of homes experienced power cuts. Three stages at the Leeds Festival were closed due to strong winds and tents were damaged, while the Creamfields music festival in Cheshire was also delayed. A number of flights at Heathrow were cancelled and the M48 Severn ridge in Gloucestershire was temporarily closed.
Exceptionally wet weather	21 to 23 May 2024	There was widespread disruption across the rail network, with the West Coast Main Line closed between Carlisle and Lockerbie and the TransPennine Express also disrupted. Localized surface water flooding also caused disruption to many roads. In Cumbria, households were temporarily cut off by rapidly rising rivers in and around the hamlet of Stockdalewath and Edinburgh city centre also experienced flooding.
Storm Kathleen	6 to 7 April 2024	Flights were cancelled at airports including Heathrow, Manchester, Birmingham, Edinburgh and Belfast City. Ferry services were also disrupted and in Northern Ireland there were impacts from fallen trees and power outages, with damage to the roof of the Titanic Belfast Museum.
Record-breaking temperature	28 January 2024	On 28 January 2024 parts of north-west Scotland recorded exceptionally high January temperatures due to a localised Foehn effect. This effect causes a marked contrast in temperature across a mountainous area, with cooler, moister conditions on the windward side and warmer, drier conditions on the leeward side where the air dries out as it is forced up and over the higher ground.
Storms Isha and Jocelyn	21 to 24 January 2024	Storm Isha brought widespread impacts, with numerous reports of fallen trees and damage to buildings. Two people died in Scotland and Northern Ireland when their cars hit fallen trees. Hundreds of thousands of properties in Scotland, Northern Ireland, north-west England and Wales experienced loss of power. There was widespread transport disruption to road, rail and air. All train services across Scotland were suspended. Storm Jocelyn caused further disruption although wind impacts were generally less than for storm Isha. However, this storm hampered clear-up and recovery operations in the aftermath of the earlier storm.
Storm Henk	2 January 2024	Storm Henk caused power outages, severe disruption to road and rail transport and flooding problems. Almost 300 flood warnings were in place in England, with others in Wales and Scotland. Hundreds of properties located near the River Severn in the West Midlands were flooded, in some cases for the fourth time of the winter. Large waves battered the coastline, particularly the south coast of England.

9.86 Details on historic extreme weather events and their impact is considered further in **Chapter 18 Climate Change**.

Flooding

9.87 Stranraer is a coastal town located on the shores of Loch Ryan. The area is located within the Dumfries and Galloway local authority area. The main source of flooding in Stranraer is coastal flooding, however

there are also risks from river and surface water flooding. There are approximately 1,000 people and 630 homes and businesses currently at risk from flooding. This is likely to increase to 1,300 people and 820 homes and businesses by the 2080s due to climate change.

- 9.88 Further details on flood risk and its impact is considered further in **Chapter 10 Flood Risk**.

Geohazards

- 9.89 Using the British Geological Survey (BGS) National Landslide Database, no landslides have been recorded in close proximity to the proposed development site. The nearest landslide event recorded was in 2014 named A77 Cairnryan located just north of the ferry terminal, Dumfries and Galloway, Scotland. However this site has been recognised as being low or negligible risk. The trigger of this geohazard event is unknown, with no apparent impact recorded. The environs of the proposed development is not considered to be at risk from geohazards such as landslides and Scotland in general is not prone to seismic activity.

Future Baseline

- 9.90 The EIA Regulations require that “a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without development as far as natural changes from the baseline scenario can be assessed with reasonable effort, on the basis of the availability of environmental information and scientific knowledge” is included within the EIAR.
- 9.91 In the event that the Proposed Development does not come forward, an assessment of the future baseline conditions has been carried out and is described within this section.

Shipping and Navigation

- 9.92 In relation to the current shipping and navigation baseline, it is anticipated that commercial vessel traffic will navigate and use the existing Stranraer Marina. There are no terminal or berth changes are planned which may affect vessel traffic in the future. Additionally, there are no new commercial ferry routes planned, at the time of writing of this chapter.

Aviation, military and communications

- 9.93 As aviation stakeholders assess impacts on a case-by-case basis and in chronological order, for aviation, military and communications, there are no known future baseline environment changes expected to affect the Proposed Development.

Natural hazards and climate system

- 9.94 The future baseline for major accidents and disasters will evolve along a number of factors over the Proposed Development lifecycle.
- 9.95 There could be changes in land or water use in the surrounding environment; water use and climate change factors could impact the local ecology and associated environmental designations. These
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changes are anticipated to be gradual in nature and as there is minimal potential for major accidents during the all project phases, this is unlikely to have a significant impact.

- 9.96 Other potential extreme natural hazards such as earthquakes, volcanoes, tsunamis, etc. are not relevant to the baseline hazard conditions in the vicinity of the Proposed Development.

Impact Assessment

Construction Phase

- 9.97 As summarised previously, this impact assessment The Stage 3 assessment involves a more detailed appraisal of the list of major events or hazards identified and assessed during scoping. In some cases, events or hazards scoped into Stage 3 may mean that these risks need to remain on the design risk register until closed out through design.
- 9.98 The shortlist and assessment of those events and/or hazards throughout the construction phase are presented in Table 9-7. Events and hazards are assessed based on their likelihood and impact and resulting level of significance, and scored and ranked as Low, Medium or High (based on the process outlined in Table 9-3).
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FAIRHURST

Table 9-7: Construction Phase Screening, Risk events and Mitigation and Management Measures

Hazard Type	Source and/or Pathway Receptor Linkage	Reasonable worst consequence if event did occur	Mitigation	Risk Evaluation		Level of Significance	Secondary Mitigation Required?
				Likelihood	Potential Impact		
Accidents at COMAH Establishments	Risk of fire/ explosion of equipment/ infrastructure failure at the site which can present a risk to the proposed development	Fire or explosion event impacting local population and/or the environment e.g. reduced driver visibility. Injury or death to site workers. Debris falling on the road Distracted drivers viewing an accident and not seeing other slowing/ stopping vehicles.	The proposed development is not in close proximity to the COMAH Establishments In the event of an accident, the establishment will have an emergency response plan registered with the HSE. The proposed development does not require any works within the establishment’s boundary itself and does not have the potential to cause an accident at the establishment	2 – Remote Chance	3 – Significant	6 – Low	No – dealt with through COMAH Establishment Emergency Response Plan
Collapse/ Damage to Structures - Bridge	Construction of the bridge requires cranes to operate off either the shore or temporary working platforms on the bank of the marina.	Crane collapse and damage resulting in injury or death to site workers / general public. Damage to existing structures/infrastructure/ utilities. Damage to occupied buildings.	Full scope of design and construction considerations and measures in terms of construction of the Proposed Scheme and use of cranes are outlined in the Framework CEMP. Health and safety measures, guidelines, and standards will be adhered to in relation to the movement and operation of cranes. Cranes will not be operated where orange or red wind or flood risk weather	2 – Remote Chance	3 – Significant	6 – Low	No

FAIRHURST

Hazard Type	Source and/or Pathway Receptor Linkage	Reasonable worst consequence if event did occur	Mitigation	Risk Evaluation		Level of Significance	Secondary Mitigation Required?
				Likelihood	Potential Impact		
	Extreme weather has potential to impact on cranes (jib height up to 80m).		warnings are in place affecting Stranraer. The fall-zone for the crane will be mapped and actions identified to ensure any occupied properties within the fall zone can be alerted. The plan will also identify emergency measures to manage access to roads, towpaths etc within the impact zone during high-risk weather conditions.				
Release of pollutants into Surface and Groundwater Bodies, Water Supplies and Sensitive Ecological Receptors	Proximity to Loch Ryan. Dewatering of groundwater during construction, particularly sections in cut.	Accidental spillage or release or contaminated materials, or sediment-laden run-off; effecting European site hydrologically connected to Lock Ryan. Pollution to surface water which connects with groundwater, potentially affecting local drinking water supply.	To minimise impact on groundwater and surface water from material spillage, all oils, solvents, paints and other potential contaminants used during construction will be stored within suitably designed bunded areas in accordance with CIRIA Report 163 – Construction of Bunds for Oil Storage Tanks, and SEPA best practice outlined in CEMP. All chemical and fuel filling locations will be contained within bunded areas. On-site facilities including surface and foul water collection will be designed and provided at both site compounds to manage surface water and foul water arising from the compounds and tinkering for removal off-site.	3 – Remote Chance	2 – Moderate	6 – Low	No

FAIRHURST

Hazard Type	Source and/or Pathway Receptor Linkage	Reasonable worst consequence if event did occur	Mitigation	Risk Evaluation		Level of Significance	Secondary Mitigation Required?
				Likelihood	Potential Impact		
			<p>Full scope of design and construction considerations and measures in terms of construction of the proposed development and mitigation and management of spillage, pollutants, and sediment controls is detailed in Chapter 2 and CEMP.</p> <p>Where groundwater is encountered, it will be dealt with separately to rainfall and captured before it becomes contaminated with sediment. Methods will be utilised as necessary, such as slope drains and pump-out to tankers for removal off-site.</p>				
<p>Existing Electrical Low Voltage below ground electrical transmission infrastructure</p>	<p>Construction plant collision risk or incidents during the processing of undergrounding</p>	<p>Potential for injuries / fatality Damage to utilities and services during excavation works</p>	<p>Proactive communications and engagement with adjacent landowners, regarding phasing, timing and duration of works will be an important aspect of the construction works.</p> <p>Mitigation by avoidance will be the primary mitigation measure implemented during the construction and operational phase of the proposed development. This will be applied to avoidance of utilities such as underground services and pipelines. Consultation will be made with utility providers to determine the location of services prior to commencement of works.</p>	<p>3 – Remote Chance</p>	<p>2 – Moderate</p>	<p>6 – Low</p>	<p>No</p>

FAIRHURST

Hazard Type	Source and/or Pathway Receptor Linkage	Reasonable worst consequence if event did occur	Mitigation	Risk Evaluation		Level of Significance	Secondary Mitigation Required?
				Likelihood	Potential Impact		
Utilities – Risk of striking watermain supply	Construction ground works	Potential minor injury for nearby personnel and potential displacement of local residences and business in the event of flooding. Potential to disrupt water supply. Clean mains water supply so no potential for contamination	Mitigation by avoidance will be the primary mitigation measure implemented during the construction and operational phase of the proposed development. This will be applied to avoidance of utilities such as underground services and pipelines. Consultation will be made with utility providers to determine the location of services prior to commencement of works.	3 – Remote Chance	2 – Moderate	6– Low	No
Construction plant on site during construction works	Moving construction plant/vehicles	Potential for injuries / fatality	Due to the movement of construction traffic, a speed limit will be implemented on site for health and safety reasons.	3 – Remote Chance	1 – Slight	3 – Low	Further health and safety measures relating to construction traffic are outlined in CEMP.
Navigation and Shipping Collision: risk of physical impacts from other existing navigation and shipping vessels (collision / allision)	Other navigational and shipping vessels operating in the area	Physical damage to project vessels and infrastructure. Potential significant impact on water quality through fuel/chemical loss and subsequent impact on biodiversity. Potential for loss of life or serious injury.	Promulgation of information and warnings through Notice to Mariners and other appropriate Maritime Safety Information (MSI) dissemination methods. Project to undertake vessel traffic monitoring for all Project-related vessels throughout all phases of the Project. Safety zones and rolling advisory clearance distances to be implemented during construction, decommissioning and major maintenance activities.	2 – Remote Chance	3 – Significant	6 - Low	No

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Hazard Type	Source and/or Pathway Receptor Linkage	Reasonable worst consequence if event did occur	Mitigation	Risk Evaluation		Level of Significance	Secondary Mitigation Required?
				Likelihood	Potential Impact		
impacting on all phases			Marker buoys and other aids to navigation. Development of Emergency Response Cooperation Plan.				
Additional HGV traffic on road network	Additional HGV traffic mixing with other road users	Potential injury or fatality to a member of the public.	Note that full road closures are assumed to perform a robust and worst-case assessment but may not be necessary and will be avoided where possible using single lane closures, to be agreed with Transport Scotland. Road closures may run concurrently or consecutively and will be agreed through consultation with Transport Scotland. Estimated durations for road closures to facilitate.	3 – Remote Chance	2 – Moderate	6 – Low	No
Falling debris from construction vehicles or scaffolding	Contractor error	Potential injury or fatality to a member of the public.	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.	2 – Remote Chance	2 – Moderate	4 – Low	Further construction phase health and safety measures a are outlined in CEMP
Flood Risk	Presence of construction materials, equipment, and potential contaminants	Potential release of contaminants onto environmental receptors (for instance surface water (rivers) or ground water) outside construction site.	Mitigation measures will be adopted as set out in the CEMP. An emergency response plan for the construction phase to minimise the consequences should the risk occur – this is set out in the CEMP and will be adopted by the appointed contractor.	2 – Remote Chance	3 – Significant	6 - Low	No

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Hazard Type	Source and/or Pathway Receptor Linkage	Reasonable worst consequence if event did occur	Mitigation	Risk Evaluation		Level of Significance	Secondary Mitigation Required?
				Likelihood	Potential Impact		
Piling (Install sheet piles – these will be installed using proprietary heavy duty piling equipment with hydraulic hammer attachments)	Construction plant collision risk or incidents during the processing of piling	Potential injury or fatality to a member of the public.	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.	2 – Remote Chance	2 – Moderate	4 – Low	Further construction phase health and safety measures a are outlined in CEMP

Operational Phase

- 9.99 The shortlist and assessment of those events and/or hazards throughout the operational phase are presented in **Table 9-8**. Events and hazards are assessed based on their likelihood and impact and resulting level of significance, and scored and ranked as Low, Medium or High (based on the process outlined in **Table 9-3**).
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FAIRHURST

Table 9-8: Operational Phase Screening, Risk events and Mitigation and Management Measures

Hazard Type	Source and/or Pathway Receptor Linkage	Reasonable worst consequence if event did occur	Mitigation	Risk Evaluation		Level of Significance	Secondary Mitigation Required?
				Likelihood	Potential Impact		
Accidents at COMAH Establishments	Risk of fire/ explosion of equipment/ infrastructure failure at the site which can present a risk to the proposed development	<p>Fire or explosion event impacting local population and/or the environment e.g. reduced driver visibility.</p> <p>Pollution event impacting local population and/ or the environment.</p> <p>Injury or death to general public.</p> <p>Debris falling on the road.</p> <p>Distracted drivers viewing an accident and not seeing other slowing/ stopping vehicles.</p>	<p>The proposed development is not in close proximity to the COMAH Establishments</p> <p>In the event of an accident, the establishment will have an emergency response plan registered with the HSE.</p>	2 – Remote Chance	3 – Significant	6 – Low	No – dealt with through COMAH Establishment Emergency Response Plan
Flood Risk	Extreme Weather (fluvial and pluvial events)	Potential damage to asset.	Mitigation measures are required to ensure there is no increased risk of flooding to the proposed development or elsewhere once constructed.	2 – Remote Chance	3 – Significant	6 - Low	Further Detail in Chapter 10 Flood Risk.

FAIRHURST

Hazard Type	Source and/or Pathway Receptor Linkage	Reasonable worst consequence if event did occur	Mitigation	Risk Evaluation		Level of Significance	Secondary Mitigation Required?
				Likelihood	Potential Impact		
Flood Risk	Land use change has potential to increase flood pattern in area	Potential secondary effects on offsite environmental or anthropogenic receptors.	Mitigation measures are required to ensure there is no increased risk of flooding to the proposed development or elsewhere once constructed.	2 – Remote Chance	3 – Significant	6 - Low	Further Detail in Chapter 10 Flood Risk.
Asset Failure	Risk of lightning strike leading to asset damage, including electrical failure, and potential subsequent fires/ explosions.	A lightning strike could cause a major accident, harm to people on-site and damage to site infrastructure. A lightning strike could also damage the distribution network, leading to damage to the national electricity transmission system. Lightning could also present a source of ignition to flammable materials. A subsequent major fire could harm people both on-site and off-site.	The engineering design of the proposed development will include appropriate electrical earthing and bonding systems. The design and maintenance of these systems will reduce the likelihood of a major accident being initiated by a lightning strike to a very low level.	2 – Remote Chance	3 – Significant	6 - Low	Guidance is provided by the HSE on the management of potential ignition caused by lightning (HSE, 2014).
Navigation and Shipping Collision: risk of physical impacts from other existing	Other navigational and shipping vessels operating in the area	Physical damage to project vessels and infrastructure. Potential significant impact on water quality through fuel/chemical	Promulgation of information and warnings through Notice to Mariners and other appropriate Maritime Safety Information (MSI) dissemination methods.	2 – Remote Chance	3 – Significant	6 - Low	No

FAIRHURST

Hazard Type	Source and/or Pathway Receptor Linkage	Reasonable worst consequence if event did occur	Mitigation	Risk Evaluation		Level of Significance	Secondary Mitigation Required?
				Likelihood	Potential Impact		
navigation and shipping vessels (collision / allision) impacting on all phases		loss and subsequent impact on biodiversity. Potential for loss of life or serious injury.	<p>Project to undertake vessel traffic monitoring for all Project-related vessels throughout all phases of the Project.</p> <p>Safety zones and rolling advisory clearance distances to be implemented during construction, decommissioning and major maintenance activities.</p> <p>Marker buoys and other aids to navigation.</p> <p>Development of Emergency Response Cooperation Plan.</p>				

Do Nothing Scenario

- 9.100 With respect to the risk of major disasters and / or accidents, the 'Do Nothing' scenario means that there are no changes to existing infrastructure or utilities as a result of the proposed development. Therefore, there would be a Neutral impact on the risk of major disasters and / or accidents under the 'Do Nothing' scenario.
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Mitigation, Monitoring and Residual Effects

Mitigation/ Monitoring

- 9.101 The assessment provided above has concluded that with the implementation of the measures included in the development (i.e. designed in and management measures (controls)), that the development's vulnerability to risks of major accidents and/or natural disasters will not result in significant adverse effects on the environment. Therefore, no further measures are proposed.

Residual Effects

- 9.102 There needs to be a general acceptance when conducting a major accident and/or disasters assessment that some risks, however unlikely, may still occur. Mitigation is therefore identified pre-event and post-event to reduce the effects to an acceptable level. For those risks that cannot be completely designed-out, emergency plans are available to provide the response in order to minimise the significance of any impacts.
- 9.103 It is considered that there will not be any likely significant environmental effects arising from the vulnerability of the proposed development to major accidents and natural disasters, as explained within the Impact Assessment Section of this chapter. .
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Cumulative Effects

9.104 It is important to consider effects, not just in isolation, but also cumulatively, as this may show that individually analysed impacts can become significant when they are added together, or with, other effects. The co-existence of impacts may increase or decrease their combined impact. Impacts that are considered to be insignificant, when assessed individually, may become significant when combined with other impacts. Cumulative effects can occur at different temporal and spatial scales. The spatial scale can be local, regional, or global, while the frequency or temporal scale includes past, present, and future impacts on a specific environment or region. Other projects can cumulatively increase the use of the road network (both during construction and operational phases), but the management and control of the risk of accidents within this context is controlled by the design standards of the project and the governing authority. Notably, there are several developments in proximity to the proposed development, including:

- The recently submitted application for a new Transport Hub – Ref: 25/1190/FUL;
- Permission for the formation of coastal habitat for seabirds Land To The West Of Loch Ryan – Ref: 24/1534/FUL;
- Permission for the Installation of one 10 metre high streetworks column, 3 antennas, 1 network camera, 1 equipment cabinet and associated works - Ref: 25/0778/FUL;
- Planning permission for the change of use of use application at the Former Stena Port site - Ref: 24/1407/FUL;

9.105 While these developments are in proximity to the proposed development, they are not expected to have significant cumulative effects on the road network usage or the risk of accidents. Each project's design and management measures ensure that any potential impacts are effectively controlled and mitigated.

9.106 In summary, when considering the proposed development in combination with other proposed and consented developments within 5km of the proposed development, there will be no significant cumulative impacts.

Summary and Conclusions

- 9.107 It is considered that there will not be any likely significant environmental effects arising from the vulnerability of the proposed development to major accidents and natural disasters.
- 9.108 This chapter of the Environmental Impact Assessment Report (EIAR) presented the assessment of predicted effects deriving from the risks of major accidents and/or disasters. The assessment is considered under two main scenarios:
- Where the proposed development may cause a major accident and/or disaster; and
- Where the proposed development is vulnerable to hazards resulting from a major accident and/or disaster.
- 9.109 Based on professional judgement, major accidents or disasters are events or situations that have the potential to affect the proposed development causing immediate or delayed serious damage to one or more of the following human health, welfare, and the environment. This assessment considers the risks of major accidents and disasters (hereafter referred to as major events) during construction and operation caused by natural hazards or manmade hazards (including operational failure).
- 9.110 A review was undertaken of baseline conditions to identify existing facilities or natural features or scenarios (such as natural gas or flooding) which could lead to risk events with associated major accident or hazard in combination with the proposed development. These developments were then screened to identify if any specific risk events required further consideration. This process also identified those, which could be screened out as not having a significant risk to retained proportionality and focus within the assessment.
- 9.111 An assessment was made in relation to the construction phase and the operational phase of the proposed development in relation to major accidents and disasters.
- 9.112 The assessment provided above has concluded that with the implementation of the measures included in the development (i.e. designed in and management measures (controls)), that the development's vulnerability to risks of major accidents and/or natural disasters will not result in significant adverse effects on the environment. Therefore, no further measures are proposed.
-