Preliminary Environmental Information Report

Calderdale Energy Park

7 April 2026

Volume 2, Chapter 20 : Major Accidents and Disasters
PINS Reference: EN0110023
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Reg 5 (2) (a)

Calderdale energy park

Table of contents

20 Major Accidents and Disasters

20.1 Introduction

20.1.1 This Chapter of the Preliminary Environmental Impact Assessment (PEIR) has been prepared by Logika Group on behalf of the Applicant and presents a preliminary assessment of the likely significant effects related to Major Accidents and Disasters that have the potential to arise during the construction, operation and maintenance and decommissioning phases of the Proposed Development. It is based on the environmental information available to date (which is detailed in this Chapter), as well as the current description of the Proposed Development as set out in **Chapter 4: The Proposed Development**.

20.1.2 This Chapter concludes that there are no preliminary likely significant effects from the Proposed Development related to Major Accidents and Disasters during the construction, operation and maintenance and decommissioning phases.

20.1.3 The assessment presented in this Chapter has drawn on the following technical aspect assessments in relation to the identification of relevant receptors/receptor groups:

- **Chapter 8: Biodiversity**;
- **Chapter 9: Ornithology**;
- **Chapter 10: Hydrogeology, Hydrology, Geology and Peat**;
- **Chapter 11: Carbon and Climate Change**;
- **Chapter 12: Landscape and Visual**;
- **Chapter 13: Historic Environment**;
- **Chapter 14: Transport and Access**;
- **Chapter 15: Noise and Vibration**;
- **Chapter 16: Air Quality**;
- **Chapter 19: Aviation and Radar**; and
- **Chapter 22: Shadow Flicker**.

20.1.4 This Chapter is supported by:

- **Appendix 20-1: Long-List of Major Accidents and Disasters Risk Events**.

20.1.5 There are no figures that support this chapter.

20.1.6 To avoid duplication across the technical assessments, the following project-specific risks are not included within this Chapter:

- Impacts on radar, which are addressed in **Chapter 19: Aviation and Radar** (note that aviation collision risks are considered in this Chapter);
- Peat landslide risks, which are addressed in **Chapter 10: Hydrology, Hydrogeology, Geology and Peat** (note that subsidence and unstable ground risks are considered in this Chapter);
- Contamination from activities associated with the Proposed Development (such as oil leaks), which are addressed in **Chapter 10: Hydrology, Hydrogeology, Geology and Peat**; and
- The mobilisation of existing/historic contaminants, which are addressed in **Chapter 23: Other Environmental Matters**.

20.2 Legislation, Policy and Guidance

20.2.1 Key policy, legislation and guidance relating to Major Accidents and Disasters and of relevance to this preliminary assessment comprises the following, as shown in **Table 20-1**.

Table 20-1: Legislation, Policy and Guidance

Type	Name	Relevance to Assessment
Legislation	Health and Safety at Work etc. Act 1974[1]	The Act provides a regulatory framework to ensure the provision of a safe working environment for individuals working in the UK. It also includes provision for those visiting a worksite and those who may be affected offsite by workplace emergencies. It includes the requirement to undertake risk assessments of occupational hazards, apply the hierarchy of controls to mitigate identified risks such that the residual risks are reduced to a level that is As Low As Reasonably Practicable (ALARP). Associated

[1] Health and Safety at Work etc. Act 1974. Available at: https://www.legislation.gov.uk/ukpga/1974/37/contents.

Type	Name	Relevance to Assessment
		regulations have been made under the Act, such as those set out below.
	The Control of Major Accident Hazard (COMAH) Regulations 2015[2]	These Regulations require that certain businesses take all necessary measures to prevent major accidents involving dangerous substances and limit the consequences to people and the environment of any major accidents that do occur.
	The Control of Substances Hazardous to Human Health Regulations 2002[3]	These Regulations require employers to assess the risks that arise from the use of hazardous substances, prevent, or if this is not reasonably practicable, control exposure to such substances and provide staff with information, instruction and training on risks.
	The Construction (Design and Management) Regulations 2015[4]	These Regulations expand upon the requirements of the Health and Safety at Work, etc. Act to apply specific requirements for construction projects and the management of construction risks to ALARP.
	The Lifting Operations and Lifting Equipment Regulations 1998[5]	These Regulations place duties on people and companies who own, operate or have control over lifting equipment to ensure safety.
National planning policy	National Policy Statement (NPS) EN-1[6]	Although Major Accidents and Disasters are not specifically mentioned, several sections of the NPS EN-1 apply generally to the assessment of Major Accidents and Disasters. Paragraph 4.4.7 highlights

[2] The Control of Major Accident Hazard (COMAH) Regulations 2015 No. 483. Available at: www.legislation.gov.uk/uksi/2015/483/contents.
[3] The Control of Substances Hazardous to Human Health 2002 No. 2677. Available at: https://www.legislation.gov.uk/uksi/2002/2677/contents.
[4] The Construction (Design and Management) Regulations 2015 No. 51. Available at: https://www.hse.gov.uk/construction/cdm/2015/index.htm.
[5] The Lifting Operations and Lifting Equipment Regulations 1998 No. 2307. Available at: https://www.legislation.gov.uk/uksi/1998/2307/contents.
[6] DESNZ (2025) Overarching National Policy Statement for Energy (EN-1). Updated January 2026. Available at: https://assets.publishing.service.gov.uk/media/6915ba42bc34c86ce4e6e726/overarching-national-policy-statement-for-energy-en-1-web-accessible.pdf.

Type	Name	Relevance to Assessment
		that most elements of energy infrastructure with the potential for significantly detrimental impacts are subject to specific regulations, which constitute effective mitigation. Paragraph 4.13.5 describes the approach to reviewing safety considerations within the Development Consent Order (DCO) consenting process and states Applicants should *"consult with the HSE on matters relating to safety"*.
	NPS EN-3[7]	While there are references to safety requirements in relation to offshore windfarms and pumped hydro storage, there is no specific reference to Major Accidents and Disasters in terms of onshore windfarms.
	NPS EN-5[8]	There are no specific references to Major Accidents and Disasters, although several sections of the NPS EN-5 apply generally to the assessment of Major Accidents and Disasters. Paragraph 2.4.3 states "*electricity networks infrastructure must in the first instance be safe and secure, and that the functional design constraints of safety and security may limit an applicant's ability to influence the aesthetic appearance of that infrastructure".*
	National Planning Policy Framework (NPPF)[9]	The NPPF provides relevant considerations for the assessment of Major Accidents and Disasters. Paragraph 45 requires that: *"Local*

[7] DESNZ (2025) National Policy Statement for Renewable Energy Infrastructure (EN-3). Updated January 2026. Available at: https://assets.publishing.service.gov.uk/media/695d1368b5c46330350ed9a2/national-policy-statement-for-renewable-energy-infrastructure-en-3-web-accessible.pdf.
[8] DESNZ (2025) National Policy Statement for Electricity Networks Infrastructure (EN-5). Updated January 2026. Available at: https://assets.publishing.service.gov.uk/media/695d12e1b5c46330350ed9a1/national-policy-statement-for-electricity-networks-infrastructure-en-5-web-accessible.pdf
[9] National Planning Policy Framework (2024). Available at: https://www.gov.uk/guidance/national-planning-policy-framework

Type	Name	Relevance to Assessment
		planning authorities should consult the appropriate bodies when considering applications for the siting of, or changes to, major hazard sites, installations or pipelines, or for development around them". Paragraph 95 notes that decisions *"should promote public safety and take into account wider security and defence requirements by … anticipating and addressing possible malicious threats and natural hazards, especially in locations where large numbers of people are expected to congregate …this includes appropriate and proportionate steps that can be taken to reduce vulnerability, increase resilience and ensure public safety and security."*
	NPPF Consultation Draft[10]	Policy P5: Maintaining public safety and security, which states: "*Development proposals should anticipate and address possible malicious threats and other hazards (whether natural or man-made)…b. Uses which could pose a potential hazard to the surrounding area. Development proposals for new major hazard sites, changes to existing major hazard sites and new development in the vicinity of major hazard sites and major accident hazard pipelines (as identified within Health and Safety Executive consultation zones) should proceed only if it can be demonstrated that the development would not increase the risk of a major accident*".
Local planning policy	Calderdale Local Plan 2018/19 –	Planning policies considered relevant include:

[10] Ministry of Housing, Communities and Local Government (2025) National Planning Policy Framework. Plan-making and national decision-making policies. Available at: https://assets.publishing.service.gov.uk/media/697b71c52ff8d10a830d5d4a/Draft_NPPF_December_2025.pdf.

Type	Name	Relevance to Assessment
	2032/33 Written Statement (March 2023)[11]	• Policy CC5 - Supporting Renewable and Low Carbon Energy. • Policy CC6 Part 1 - Assessment of Proposals for Renewable and Low Carbon Energy. • Policy EN1 – Pollution Control. • Policy EN3 – Environmental Protection.
	Local Plan for the Bradford District – Core Strategy Development Plan Document, Adopted July 2017[12]	Planning policies considered relevant include: • Policy EN8 – Environmental Protection.
	Pendle Local Plan Fourth Edition 2021-2040[13]	Planning policies considered relevant include: • Policy DM14 – Contamination and Unstable Land.
National Guidance	Institute of Environmental Management and Assessment (IEMA (now the Institute of Sustainability and Environmental Professionals (ISEP)), September 2020) 'Major Accidents and Disasters in EIA: A Primer' (IEMA,	The guidance provides a methodology for the assessment of Major Accidents and Disasters within Environmental Impact Assessment (EIA), the principles of which have been adopted for the preliminary assessment.

[11] Calderdale Council (2023) Local Plan 2018/2019 to 2032/33. Available at: https://calderdale-consult.objective.co.uk/kse/event/37273.
[12] Bradford Council (2017) Local Plan for the Bradford District. Core Strategy Development Plan. Available at: https://www.bradford.gov.uk/Documents/planningStrategy/10/Adopted%20core%20strategy//1%20Core%20Strategy%20full%20document.pdf
[13] Pendle Borough Council Local Plan (adopted 2025). Pendle Local Plan Fourth Edition 2021-2040. Available at: https://www.pendle.gov.uk/info/20072/planning_policies/600/local_plan_fourth_edition.

Type	Name	Relevance to Assessment
	2020)[14] (the 'IEMA 2020 guidance')	
	Environmental Impact Assessment of Projects, Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission, 2017)[15]	The guidance sets out how to develop a good quality environmental impact report to ensure appropriate information is available for decision-making purposes. Section 1.3.3 relates to the impacts of Major Accidents and Disasters and outlines key considerations, including the use of risk-based significance criteria.
	Health and Safety Executive (HSE) Guidance on ALARP Decisions in COMAH (2010)[16]	This guidance sets out the use of ALARP in risk management.

20.3 Scoping and Stakeholder Engagement

2025 Scoping Opinion

20.3.1 In September 2025, a request for a scoping opinion was submitted alongside a Scoping Report to the Planning Inspectorate (PINS) under the EIA Regulations. The Scoping Opinion forms the primary statutory basis for defining the scope of the EIA. **Table 20-2** presents the details of the PINS Scoping Opinion relevant to Major Accidents and Disasters and confirms how these have been addressed within the proposed scope of assessment.

20.3.2 Detailed responses were also received from consultees and stakeholders and **Table 20-3** provides a summary of the key comments and how these have been addressed within the proposed scope of assessment.

[14] IEMA (2020) Major Accidents and Disasters in EIA: A Primer. Available at: j27374_iema_major_accidents__disasters_final-1.pdf.
[15] European Commission (2017) Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report. Available at: https://publications.europa.eu/resource/cellar/2b399830-cb4b-11e7-a5d5-01aa75ed71a1.0001.03/DOC_1.
[16] HSE (2020) Guidance on ALARP in Decisions in COMAH. Available at: https://www.hse.gov.uk/foi/internalops/hid_circs/permissioning/spc_perm_37/.

Table 20-2: Consideration of PINS Scoping Opinion

Consultee	PINS ID	Summary of Scoping Opinion Response	Consideration within the Scope of Assessment
PINS	3.14.3	PINS request that matters such as battery related fires, aviation and radar, landslides, wildfires and pollution are considered within the ES.	Following the submission of the Scoping Report, the Battery Energy Storage System (BESS) element of the Proposed Development has been removed. Therefore, BESS and the associated risks have not been included within this preliminary assessment. However, the risk of fire associated with the remaining elements of the Proposed Development is included. As noted in **Section 20.1**, effects related to peat instability/peat slide are addressed in **Chapter 10: Hydrology, Hydrogeology, Geology and Peat**. Effects related to radar are addressed in **Chapter 19: Aviation and Radar**. Effects related to pollution from activities associated with the Proposed Development and the mobilisation of existing contamination are addressed within **Chapter 10: Hydrology, Hydrogeology, Geology and Peat** and **Chapter 23: Other Environmental Matters**, respectively. Risk events relating to aviation collision, landslides, wildfires and pollution (specifically that from the release of chemicals), along with other identified risk events (see further details below), are also included within the assessment reported in this Chapter.

Table 20-3: Consideration of Scoping Responses from Consultees and Stakeholders

Consultee/ Stakeholder	Summary of Response	Consideration within the Scope of Assessment
Bradford Council	Concerns associated with the BESS and accidents/ fire risk: *"It is acknowledged that various documentation will be submitted with the DCO to address BESS and the accident/fire risks, but due to the lack of information, we are unable to comment as to whether this should be scoped in or out."*	The BESS has been removed from the Proposed Development. Therefore, fire risks from a BESS have not been considered further within the assessment presented in this Chapter.
Calderdale Council	Request for Major Accidents and Disasters to be scoped in due to fire risk associated with the BESS (including unplanned atmospheric emissions), Substation and Turbines, as well as wildfire risk. Stated that "*The Council welcomes the Unplanned Atmospheric Emissions from BESS Report…The Air Quality Chapter must summarise… receptor impacts, and mitigation/ response (cross-refer to…Major Accidents & Disasters.)".* "*Fire risk creates cross-cutting impact pathways (Air Quality/Health from smoke/PM, Ground/Water from fire-water, Transport from hazardous loads, and Major Accidents & Disasters/emergency response)".*	The BESS has been removed from the Proposed Development and therefore has not been considered further. The potential risks associated with fire, including wildfire (given the presence of habitats such as peat and heather, which are known to be flammable[17]), have been addressed within the preliminary assessment reported in this Chapter.

[17] UK Parliament (2024) POSTnote 717: Wildlife fires to UK landscapes. Available at: https://researchbriefings.files.parliament.uk/documents/POST-PN-0717/POST-PN-0717.pdf.

Consultee/ Stakeholder	Summary of Response	Consideration within the Scope of Assessment
	"The Council's Environmental Health Officer has also emphasised that although the SR suggests this topic should be scoped on the risk of major accident risk register." *"Given the peat and the heather over this area this should be considered. The site is also a SSSI."*	
Environment Agency	*"Risks to water quality from BESS fires should be considered as a major accident and should be scoped in".*	As stated above, the BESS has been removed from the Proposed Development and therefore will not be considered further.
Health and Safety Executive (HSE)	*"The Applicant should make contact with the operators of the Major Hazards sites, to inform an assessment of whether or not the proposed development is vulnerable to a possible major accident."*	Further information is being gathered on major accident hazard sites and major accident hazard pipelines from the HSE at this stage. Consideration will be given to Major Accident Hazard Sites and Major Accident Hazard Pipelines and any associated Consultation Zones as part of the ES. Preliminary consideration has been provided within this Chapter.
Wadsworth Parish Council	*"We strongly disagree with the decision to scope out the risk of major accidents, including peat slides."* *"Fire and emissions to air of the battery energy storage system (not to mention any fire water runoff and the potential of chemical pollution entering the reservoirs"*	Major Accidents and Disasters has been included within the scope of the EIA (and a preliminary assessment reported in this Chapter). The BESS has been removed from the Proposed Development and has not been considered further. Effects related to peat instability and peat slide are addressed in

Consultee/ Stakeholder	Summary of Response	Consideration within the Scope of Assessment
	"peat slide and bog burst history in the North West site access search area"	**Chapter 10: Hydrology, Hydrogeology, Geology and Peat**, which is supported by a Preliminary Peat Landslide Hazard Risk Assessment (PPLHRA) (**Appendix 10-4**).

Further Engagement Undertaken

20.3.3 No further engagement beyond stakeholder consultation to inform scoping and the Scoping Opinion has been undertaken to date for Major Accidents and Disasters. Further engagement to obtain information on Major Accident Hazard Sites and Major Accident Hazard Pipelines and any associated Consultation Zones information will be undertaken with the HSE.

20.4 Assessment Methodology

Definitions

20.4.1 Based on the IEMA 2020 guidance, Major Accidents and Disasters are defined as follows:

"*A major accident is an event (for instance, train derailment or major road traffic accident) that threatens immediate or delayed serious environmental effects to human health, welfare and / or the environment and requires the use of resources beyond those of the client or its appointed representatives (i.e. contractors) to manage*.

A disaster is 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, which meets the definition of a major accident above".

20.4.2 To determine whether an accident or disaster is 'major', the following criteria (as contained within Schedule 5 of the COMAH Regulations 2015) have been used as they have been endorsed by the HSE[18] and the Environment Agency[19]:

- An injury to a person which is fatal;

[18] HSE (2001) Reducing Risks and Protecting People. Available at: https://www.hse.gov.uk/enforce/expert/index.htm.
[19] Chemical and Downstream Oil Industries Forum (CDOIF) (2016). Available at: https://www.sepa.org.uk/media/219154/cdoif_guideline__environmental_risk_assessment_v2.pdf.

- Up to six persons are injured within the establishment and hospitalised for at least 24 hours;
- One person outside the establishment is hospitalised for at least 24 hours;
- A dwelling outside the establishment is damaged and is unusable as a result of the accident;
- The evacuation or confinement of persons for more than two hours, where the value (persons × hours) is at least 500;
- The interruption of drinking water, electricity, gas or telephone services for more than two hours, where the value (persons × hours) is at least 1,000;
- Damage to property in the establishment, to the value of at least 2,000,000 Euro (approximately £1,741,000 as of 20 January 2026);
- Damage to property outside the establishment, to the value of at least 500,000 Euro (approximately £435,000 as of 20 January 2026);
- Permanent or long-term damage to terrestrial habitats involving:
    - 0.5hectares (ha) or more of a habitat of environmental or conservation importance protected by legislation; or
    - 10ha or more of more widespread habitat, including agricultural land;
- Significant or long-term damage to freshwater and marine habitats involving:
    - 10km or more of river or canal; or
    - 1ha or more of a lake or pond; or
    - 2ha or more of delta; or
    - 2ha or more of a coastline or open sea;
- Significant damage to an aquifer or underground water of 1ha or more.

20.4.3 Events that have the potential to cause a Major Accident or Disaster are termed 'risk events' and are defined in the IEMA 2020 guidance as:

"*An identified, unplanned event, which is considered relevant to the development and has the potential to result in a major accident and / or disaster, subject to assessment of its potential to result in a significant adverse effect on an environmental receptor.*"

20.4.4 The principle of ALARP, established in the legislative framework related to public safety and risk management set out in **Table 20-1**, has been used in the preliminary assessment that is reported in this Chapter. ALARP describes the level to which regulators (e.g. the HSE) expect to see workplace risks controlled, taking account of being 'reasonably practicable' (i.e. weighing a risk against the effort, time and money needed to control it). This is reinforced by the IEMA 2020 guidance, which includes the following definition of ALARP:

"Involves weighing a risk against the trouble, time and money needed to control it. Thus, ALARP describes the level to which we expect to see risks controlled."

Study Area

20.4.5 The study area for the assessment of Major Accidents and Disasters is not defined within regulations, standards or guidance. At this stage, the study area for risk events identified to be relevant to the Proposed Development has focused on the PEIR Boundary and the receptors identified across the relevant technical aspects listed in **Section 20.1**. Further details on the extent of the study area will be presented within the ES.

Baseline Data Collection

20.4.6 A desk study has been undertaken to identify the available information in relation to Major Accidents and Disasters relevant to the Proposed Development. The sources used include the following:

- National Risk Register (2025 edition)[20];
- The HSE's COMAH 2015 Public Information Search[21];
- British Geological Society (BGS) website[22], and specific geohazard notes on volcanic hazards[23] and seismic hazards[24];
- The Ground Sure Report obtained for the Proposed Development (**Appendix 23-2**); and

[20] HM Government (2025) National Risk Register. Available at: https://assets.publishing.service.gov.uk/media/67b5f85732b2aab18314bbe4/National_Risk_Register_2025.pdf.
[21] HSE (Online) COMAH 2015 Public Information Search. Available at: https://notifications.hse.gov.uk/COMAH2015/Search.aspx.
[22] British Geological Survey (2025) Geology Viewer. Available at: https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/.
[23] British Geological Survey (2012) UK Geohazard Note: Volcanic Hazards.
[24] British Geological Survey (2013) UK Geohazard Note: Seismic Hazards.

- Belcher et al., (2021) UK wildfires and their climate challenges. Expert Led Report Prepared for the third Climate Change Risk Assessment[25].

20.4.7 A review has also been undertaken to identify relevant receptors for the assessment of Major Accidents and Disasters within other relevant technical aspect chapters of this PEIR, as listed in **Section 20.1**.

Methodology

Scenarios

20.4.8 The preliminary assessment has considered the following phases of the Proposed Development:

- Construction – including the construction of the wind turbines, cable routes and access roads and other associated infrastructure;
- Operation and maintenance – including ongoing operation and maintenance activities; and
- Decommissioning – including the removal of above-ground infrastructure.

Approach to Assessment

20.4.9 In line with the principles of the guidance listed in **Section 20.2**, the following staged process has been undertaken:

1) Collection of baseline information relevant to Major Accidents and Disasters based on the sources outlined in **Section 20.5**;
2) Identification of relevant receptors based on the Scoping Opinion and a review of the location of the Proposed Development and other technical aspects. These comprise:
    - Population and health receptors, such as construction, operation and maintenance and decommissioning workers, members of the public and local residents;
    - Ecological receptors, such as designated sites, habitats and protected/notable faunal and floral species;
    - Water environment features, including both surface and groundwater; and

[25] Belcher et al., (2021) UK wildfires and their climate challenges. Expert Led Report Prepared for the third Climate Change Risk Assessment. Available at: https://www.ukclimaterisk.org/wp-content/uploads/2021/06/UK-Wildfires-and-their-Climate-Challenges.pdf.

- Historical/cultural receptors, including designated and non-designated heritage assets.

3) Identification of risk events based on the National Risk Register and development-specific risk events associated with the Proposed Development due to its location and nature, drawing on previous professional experience of consenting onshore windfarms;

4) An initial 'sifting' exercise of all risk events identified through Stage 3 (above) based on a review of the operations and activities during all phases of the Proposed Development to produce a long-list of relevant risk events;

5) Screening of the long-list. This was to determine the likelihood of the long-list risk events and/or whether there is a credible potential source-pathway-receptor linkage in the context of the Proposed Development. Where the relevant risk events in the long-list were identified to be highly unlikely due to the location or nature of the Proposed Development, or there is no credible source-pathway-receptor linkage, these were not taken forward for further assessment. The outputs of this stage are provided in **Appendix 20-1**; and

6) The remaining risk events (the short-list) have been brought forward for further assessment (and are considered in this Chapter).

20.4.10 For the risk events brought forward for further assessment, the following process has been followed:

- The identification of the potential impacts and reasonably foreseeable consequences related to the risk event;
- Evaluation, including consideration of environmental measures to avoid or reduce the risk event and whether these measures reduce the likelihood of the risk event to be ALARP (for the purposes of this assessment, the environmental measures are those considered to be implemented irrespective of the need for environmental assessment, for instance, adherence to engineering design standards). Where additional mitigation is required to ensure ALARP, this is also identified (for the purposes of this assessment, the additional mitigation measures are those over and above what would typically be required by H&S regulations); and
- Qualitative consideration of the tolerability of any residual risks.

20.4.11 The tolerability of the residual risks has been categorised using professional judgement and considering the consequence, drawing upon the acceptability levels

defined in the HSE's 'COMAH Competent Authority 'All Measures Necessary' – Environmental Aspects guidance'[26]:

- Tolerable: The level of residual risk is regarded as adequately controlled/broadly acceptable and comparable to those that people regard as trivial in their daily lives;
- Tolerable (if ALARP): The level of residual risk is such that people are prepared to tolerate this level of risk in order to secure benefits, such as employment. The expectation is that risks are properly assessed and kept ALARP through the application of appropriate mitigation and are kept under review; and
- Intolerable: The level of residual risk is regarded as unacceptable, whatever the level of benefit associated with the activity.

20.4.12 If a residual risk is able to be mitigated to 'Tolerable' or 'Tolerable (if ALARP)', this is considered to be 'Not Significant', and if a residual risk is identified as 'Intolerable', this is considered to be 'Significant'.

20.4.13 Residual risks categorised as tolerable (if ALARP) require further assessment to determine what control measures are required as "reasonably practicable" for the Proposed Development.

20.4.14 The Applicant will undertake any necessary studies, where required by UK legislation and industry good practice, to support the safe design, construction, operation and maintenance and decommissioning phases of the Proposed Development. The scope of these studies would meet the requirements of the Health and Safety at Work etc. Act 1974, Construction Design and Management (CDM) Regulations 2015 and good engineering design practice and demonstrate that suitable and sufficient risk control measures have been applied to mitigate risks to an acceptable level, thereby demonstrating ALARP.

Limitations and Assumptions

20.4.15 The assessment presented within this Chapter is based on the information available at the time of writing, based on the preliminary design of the Proposed Development and early appraisal of potential hazards that will be refined and reappraised as the design for the Proposed Development is refined for the ES.

[26] HSE (2016) COMAH Competent Authority Guidance: 'All measures necessary' – Environmental aspects (online). Available at: https://www.sepa.org.uk/media/219152/d130416_all-measures-necessary-guidance.pdf.

20.4.16 No site visits / surveys beyond those undertaken to inform other technical aspects have been undertaken to establish the baseline for the Major Accidents and Disasters assessment.

20.4.17 At this stage, further modelling in relation to flood risk is required, as set out in **Chapter 10: Hydrology, Hydrogeology, Geology and Peat**. Therefore, the analysis presented in this Chapter has not covered these risk events at this stage due to the absence of available information. Further information will be provided within the ES on these risk events.

20.5 Baseline Conditions

Overview

20.5.1 This section sets out the baseline conditions relevant to the assessment of Major Accidents and Disasters, drawing on knowledge of the prevailing conditions and data outlined in **Section 20.4**. Baseline data from other relevant technical aspects chapters, as outlined in **Section 20.1**, is not duplicated below.

Existing Baseline

Infrastructure

20.5.2 There are a number of reservoirs and related infrastructure within the vicinity of the PEIR Boundary, including the Upper, Middle and Lower Walshaw Reservoirs in the centre (but outside) of the Turbine Area and Widdop Reservoir to the south-west of the Turbine Area. Further details on the reservoirs and associated infrastructure are provided in **Section 10.5** of **Chapter 10: Hydrology, Hydrogeology, Geology and Peat**.

20.5.3 There are a number of roads/highways within and in the vicinity of the PEIR Boundary, including the A6068 to the north and the A6033 to the south-east. Further details on roads/highways are provided in **Section 14.5** of **Chapter 14: Transport and Access**.

20.5.4 There are a number of railway lines in the vicinity of the PEIR Boundary, the closest of which is the Calder Valley Line, lying approximately 4.3km to the south.

Major Accident Hazards Sites and Pipelines

20.5.5 The PEIR Boundary overlaps the Consultation Zones of several Major Accident Hazard Sites, including:

- HSE ref 3447; operated by Michael Harvey Haircare Products Ltd; and
- HSE ref 3619; operated by Blagden Chemical Specialists Ltd.

20.5.6 There are known to be a number of Major Accident Hazard Pipelines that are within or in the vicinity of the PEIR Boundary, as follows:

- HSE ref. 6808; Cadent Gas Ltd Greenhead Lane / Barrowford, which falls on the land associated with the Proposed Development to the east of Barrowford.
- HSE ref. 7668; Northern Gas Networks East Bierley / Pool Bank, which falls on the land associated with the Proposed Development between Wetstone Plantation and the south of Woodhall
- HSE ref. 7673; Northern Gas Networks Hebden Bridge / Mulcture Hall, which falls on the land associated with the Proposed Development near to the Pye Nest area of Halifax
- HSE ref. 7680; Northern Gas Networks Keighley / Baildon, which falls on the land associated with the Proposed Development near Bingley train station; and
- HSE ref. 7691; Northern Gas Networks Menston / Canal Road, which falls on the land associated with the Proposed Development between Baildon and to the south of Bolton Woods

20.5.7 Full details of the Major Accident Hazard Sites and Major Accident Hazard Pipelines will be provided in the ES.

20.5.8 The HSE have confirmed that there are no Regulated Explosive Sites in the vicinity of the PEIR Boundary via the Scoping Opinion.

Natural Disasters

20.5.9 Based on information from BGS website and Geohazard notes, the UK is not located in an active volcanic region nor is the UK does not lie in a region frequently affected by tropical cyclones (also known as hurricanes, typhoons, or cyclones) or tsunamis.

20.5.10 Based on available information published by BGS[27], the PEIR Boundary is also located within an area of low seismic hazard risk.

Natural Hazards

20.5.11 Hazards resulting from severe weather events which could impact the Proposed Development include:

- Storms and gales;
- High temperatures and heatwaves;

[27] https://www.earthquakes.bgs.ac.uk/hazard/UKhazard.html.

- Low temperatures and snow;
- Drought; and
- Events of reduced visibility due to air quality (poor air quality).

Wildfires[28]

20.5.12 As stated in the 'UK wildfires and their climate challenges. Expert Led Report Prepared for the third Climate Change Risk Assessment', wildfires in the UK are considered a semi-natural hazard due to their linkages with human activities, such as land management practices and accidents/arson. This report also notes that wildfires in the UK are mostly limited by fuel moisture conditioning and fuel availability, such as the amount of dry vegetation or soil susceptible to burn, hence high temperatures are not a necessity for fires to occur in the UK. However, there are typically two fire seasons in spring and mid-late summer. The majority of wildfires occur in the UK within grasslands and broadleaved woodlands, although heathlands and moorlands are affected. The intensity of most UK fires is usually low to moderate, with fire mostly affecting surface fuels, although smouldering fires in peaty soils are known (e.g. at Saddleworth Moor in 2018).

20.5.13 The PEIR Boundary includes upland moorland, which is known to be vulnerable to wildfires. The PEIR Boundary lies within the area monitored by the Walshaw Estate gamekeepers[29].

Utilities and Services

20.5.14 The PEIR Boundary is crossed by a number of utilities and services, including electricity cables, gas pipelines, water mains and telecommunication cables. Further details of the utilities and services will be provided in the ES.

Ground Stability Hazards

20.5.15 The GroundSure Report (**Appendix 23-2**) contains information on natural ground subsidence issues within the Turbine Area. This is set out in **Table 20-4**. Further information will be obtained for the Access Routes and Bradford West Cable Corridor and presented in the ES.

[28] The term 'wildfire' is defined as '*any uncontrolled vegetation fire which requires a decision, or action, regarding suppression*' based on the Scottish Government, (2013). Fire and Rescue Service Wildfire Operational Guidance. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2013/10/fire-rescue-service-wildfire-operational-guidance/documents/wildfire-operational-guidance/wildfire-operational-guidance/govscot%3Adocument/00436138.pdf.
[29] https://www.nationalgamekeepers.org.uk/moorland-fire-index.

Table 20-4: Natural Ground Subsidence in the Turbine Area

Hazard type	Identified the level of risk
Shrink swell clays	Negligible to Very Low
Running sands	Negligible to Low
Compressible deposits	Negligible to High
Collapsible deposits	Negligible to Very Low
Landslides	Very Low to High
Ground dissolution of soluble rocks	Negligible

20.5.16 As noted in **Chapter 10: Hydrology, Hydrogeology, Geology and Peat**, the PEIR Boundary is underlain by peat with potential instability issues. Further details are provided in **Chapter 10: Hydrology, Hydrogeology, Geology and Peat** and **Appendix 10-4**.

20.5.17 Historic mineral workings within, and in the vicinity of, the PEIR Boundary are known to have occurred. Further details will be provided in the ES.

Unexploded Ordnance

20.5.18 Given the rural area of the PEIR Boundary, there is considered to be a low risk of Unexploded Ordnance (UXO) being identified. Further desk study information will be undertaken and details will be provided in the ES.

Human Health and Environmental Receptors

20.5.19 Across this PEIR, a number of human health and environmental receptors have been identified which could be affected by the risk events identified for Major Accidents and Disasters. These receptors have been categorised into four main 'receptor types' as detailed in **Table 20-5**.

Table 20-5: Human Health and Environmental Receptors

Receptor Type	Name	Location
Human health	Onsite workers during construction, operation and maintenance and decommissioning phases	Within and surrounding the PEIR Boundary.
	Members of the public, including users of the Pennine Way (Further details are provided in	Within and surrounding the PEIR Boundary.

Receptor Type	Name	Location
	Chapter 14: Transport and Access).	
	Local residents. (Further details are provided in **Chapter 12: Landscape and Visual**, **Chapter 15: Noise and Vibration**, **Chapter 16: Air Quality** and **Chapter 22: Shadow Flicker**)	Within and surrounding the PEIR Boundary.
Ecological	Designated ecological sites, including the South Pennine Moors Phase 2 SPA, South Pennine Moors SAC and South Pennine Moors SSSI. (Further details are provided in **Chapter 8: Biodiversity** and **Chapter 9: Ornithology**).	Within and surrounding the PEIR Boundary
	Habitats, including blanket bog, upland heathland and grass moorland. (Further details provided in **Chapter 8: Biodiversity**).	Within and surrounding the PEIR Boundary.
	Protected and notable faunal and floral species. (Further details are provided in **Chapter 8: Biodiversity** and **Chapter 9: Ornithology**).	Within and surrounding the PEIR Boundary.
Water environment	Surface features, including watercourses and reservoirs, and groundwater bodies. (Further details are provided in **Chapter 10: Hydrology, Hydrogeology, Geology and Peat**).	Within and surrounding the PEIR Boundary.
Historical/ cultural	Listed Buildings, Scheduled Monuments, Conservation Areas, non-designated heritage assets (including archaeological remains). (Further details are provided in **Chapter 13: Historic Environment**).	Within and surrounding the PEIR Boundary.

Further Data Collection

20.5.20 Further desk-based data will be collected for the ES through desk studies, particularly in relation to Major Accident Hazard Sites and Major Accident Hazard Pipelines and their relevant Consultation Zones, subsidence/ground stability issues and Unexploded Ordnance.

Future Baseline

20.5.21 In the absence of the Proposed Development, changes in land use in the surrounding environment could occur, which could become more agricultural, industrial, residential or recreational in use. Such changes in land use could impact the local ecological, water environment and historical/cultural receptors.

20.5.22 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 (and therefore wildfires) and 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 a disaster or trigger a major accident or disasters. Anticipated climate change impacts are presented in **Chapter 11: Carbon and Climate Change**.

20.6 Environmental Measures

Construction

20.6.1 The environmental measures for the construction phase include:

- Restriction of construction site access to suitably qualified workers only;
- Adherence to relevant legislation, including the Health and Safety at Work etc. Act. 1974, The Control of Substances Hazardous to Health Regulations 2002, the CDM Regulations 2015, The Lifting Operations and Lifting Equipment Regulations 1998 and The Working at Height Regulations 2005. Good practice working measures, including risk assessments and method statements, will be put in place in accordance with this legislation;
- Adherence to relevant guidance, including the HSE's Avoiding danger from underground service[30], Fire Prevention on Construction Sites: Joint Code of Practice[31] and the HSE's Fire Safety in Construction[32];

[30] HSE (2014) Avoiding danger from underground services HSG47.
[31] The Fire Protection Association (2023) Fire Prevention on Construction Sites: Joint Code of Practice 9th edition
[32] HSE (2022) Fire safety in construction HSG168.

- Preparation of a Construction Phase Plan, required by the CDM Regulations 2015 prior to construction commencing;
- Detailed ground investigations in line with relevant standards and guidance, including British Standard 3930:2015[33] and BSEN1997: Part 2: 2007 Eurocode 7[34];
- Earthworks and foundation design in accordance with national standards and guidance, including British Standard 6031:2009: Code of Practice for Earthworks[35] and Building Regulations Approved Document A - Structure[36];
- Use of methods to address unstable ground / geotechnical hazards, including temporary works (such as the shoring of excavations);
- Communication of the potential risks of discovering UXO to construction workers, with the provision of safety training given. Safety monitoring will be adopted where required; and
- Appropriate storage, handling and disposal of chemicals in line with the Control of Substances Hazardous to Human Health Regulations 2002.

20.6.2 These environmental measures will be secured as part of the following management plans:

- Outline Construction Environmental Management Plan (oCEMP); and
- Outline Construction Traffic Management Plan (oCTMP).

Operation and Maintenance

20.6.3 The environmental measures for the operational and maintenance phase include:

- The Proposed Development is being designed in accordance with the appropriate aviation lighting requirements by the Civil Aviation Authority and the aviation lighting strategy will be agreed with the Civil Aviation Authority;
- Wind turbines will be fitted with an active fire protection system that will detect flames, heat, gas, and smoke, alert personnel and rescue services and activate fire suppression or extinguishing systems;
- All operational plant / infrastructure will be designed, installed and maintained in line with relevant legislation, standards and guidance, including Electrical

[33] British Standard 5930: 2015 + A1:2020 Code of Practice for Site Investigations.
[34] British Standards Eurocode 7: Geotechnical Design (2006).
[35] British Standard 6031:2009: Code of Practice for Earthworks.
[36] HM Government (2013) Approved Document A - Structure.

Equipment (Safety) Regulations 2016[37] and Electricity Safety, Quality and Continuity (Amendment) Regulations 2006[38];

- The wind turbines will have a lightning protection system, with appropriate grounding. The system will also measure the strength of a lightning strike and aid in the detection of potential damage;
- Throughout the operation and maintenance phase, there will be regular checks and inspections of the wind turbines and other onsite plant, in conjunction with remote monitoring and alarm systems which will be relayed to a centralised control room facility;
- All works at height will be in line with The Lifting Operations and Lifting Equipment Regulations 1998 and The Working at Height Regulations 2005;
- Appropriate storage, handling and disposal of chemicals in line with the Control of Substances Hazardous to Human Health Regulations 2002;
- The wind turbine control system will connect to sensors on the blades, which will detect the buildup of ice and automatically prevent the turbines from spinning when ice has built up on the turbine. Onsite operation and maintenance workers will be trained regarding the potential for ice throw. Ice risk conditions will be monitored and public notices will be displayed at access points (such as on the Pennine Way within the Turbine Area), alerting members of the public where there is a possible risk of ice throw due to weather conditions;
- Setbacks from the Pennine Way have been included in design of the Proposed Development, based on topple distance for safety;
- The design of the wind turbines will also be informed by detailed analysis to minimise any aeroelastic effects and appropriate measures will be implemented, such as ensuring that there is enough damping for the different modes and that there is no resonance; and
- The wind turbines will be constructed to relevant engineering standards, including British Standard EN 61400, which relates to wind turbine structural components[39].

20.6.4 These environmental measures will be secured as part of the following management plans:

[37] HSE (2006) Health and safety in construction HSG150 HSE (2006) Health and safety in construction HSG150
[38] Health and Safety at Work etc. Act 1974 c. 37.
[39] British Standard EN IEC 61400-8:2024.

- Aviation Lighting Strategy; and
- Outline Operational Environmental Management Plan (oOEMP).

Decommissioning

20.6.5 The environmental measures for the decommissioning phase are anticipated to be the same as those outlined for the construction phase above, as relevant.

20.6.6 The environmental measures will be secured as part of the following management plans:

- Decommissioning Environmental Management Plan (DEMP); and
- Decommissioning Traffic Management Plan (DTMP) (either as a separate document or as part of the DEMP).

20.7 Potential Effects Scoped Out

20.7.1 The risk events which are 'scoped out' of the further assessment for Major Accidents and Disasters are as follows. Further details and justification are provided in **Appendix 20-1**:

- International terrorist attack with strategic implications;
- Terrorist attacks in publicly accessible locations;
- Terrorist attacks on transport;
- Conventional attacks on infrastructure;
- Cyber attacks on infrastructure;
- Rail accident;
- Malicious drone incident;
- National/regional failure of the electricity network;
- Accidental fire or explosion at an onshore Major Accident Hazard Site;
- Accidental large toxic chemical release from an onshore Major Accident Hazard Site;
- Reservoir/dam collapse;
- Water infrastructure failure or loss of drinking water;
- Volcanic eruption;

- Tropical cyclones or tsunamis;
- Earthquakes/seismic activity;
- Storms and gales;
- High temperatures and heatwaves;
- Low temperatures and snow;
- Drought;
- Poor air quality;
- Pandemic;
- Animal disease outbreak;
- Plant pest/disease outbreak;
- Public disorder; and
- Industrial action.

20.8 Preliminary Environmental Assessment

20.8.1 The risk events in **Table 20-6**and **Table 20-7**have been identified for further assessment in relation to the construction and operational and maintenance and decommissioning phases. The assessment includes an overview of the potential environmental impacts and consequences alongside an evaluation of risk, including the relevant environmental measures proposed which reduce the risk. Additional mitigation will be applied if the risk is above Tolerable, to ensure that the residual risk is Tolerable (if ALARP). A conclusion is then provided on the tolerability of the residual risks in line with paragraph 20.4.11.

Construction Phase

Assessment of Shortlisted Risk Events

20.8.2 The risk events ‘scoped in’ for further assessment and relevant to the construction phase are set out in **Table 20-6**.

Table 20-6: Further Assessment of Risk Events (Construction Phase)

Risk Event	Potential Impacts and Consequences	Evaluation (Including Consideration of Environmental Measures and Additional Mitigation)	Preliminary Assessment of Tolerability of Residual Risk
Accident involving high-consequence dangerous goods	A collision between vehicles and workers/equipment could cause harm to human health receptors.	There are limited routes along which Abnormal Indivisible Loads (AILs) are anticipated to travel to/from the construction areas and only short-time periods where AIL deliveries are required (i.e. turbine delivery periods). Given the potential risk of accidents, additional mitigation has been identified to be required, including the measures set out in **Chapter 14: Transport and Access** to be included within the oCTMP. These measures will reduce the likelihood of the risk event from occurring, such that with these measures in place, the risk is considered to be ALARP.	Tolerable (if ALARP) (Not Significant)
Accidental fire or explosion at an onshore Major Accident Hazard Pipeline	Strike of a Major Accident Hazard Pipeline leading to a fire and/or explosion, which could result in harm to human health receptors and/or cause harm/damage to ecological, water environment or	During construction, working areas will be temporarily secured with restricted access so that only suitably qualified workers are present. Works to confirm the location of utilities will be undertaken before the commencement of activities in liaison with the relevant operators. Good practice working measures will be put in place in accordance with the CDM Regulations 2015, such as the preparation of risk assessments and method statements, which will include making workers aware of the location of utilities and their easements where works are undertaken close to utilities. In addition, works will adhere	Tolerable (Not Significant)

Risk Event	Potential Impacts and Consequences	Evaluation (Including Consideration of Environmental Measures and Additional Mitigation)	Preliminary Assessment of Tolerability of Residual Risk
	historical/cultural receptors.	to relevant HSE guidance, including Avoiding danger from underground services. These measures will be implemented as part of the oCEMP and reduce the likelihood of the risk event from occurring, such that with these measures in place, the risk is considered to be ALARP.	
Fire	Fires could result in harm to human health receptors. Fires could also start wildfires, causing harm/ damage to human health, ecological, water environment or historical/cultural receptors.	During construction, working areas will be temporarily secured with restricted access so that only suitably qualified workers are present. Works during construction will be undertaken in line with relevant guidance, such as Fire Prevention on Construction Sites: Joint Code of Practice and HSE's Fire Safety in Construction. This will include measures to prevent and control fires and sparks, and procedures will be prepared and implemented to respond to fires if they arise. Given the potential risk of fire and the habitats present, additional mitigation has been identified to be required, including regular risk assessment of fire/wildfire risk, drawing on the principles of DEFRA's wildlife management plan guidance[40]. Early and regular engagement with the relevant fire authorities will also be undertaken. This will	Tolerable (if ALARP) (Not Significant)

[40] https://www.gov.uk/government/publications/wildfire-management-plan.

Risk Event	Potential Impacts and Consequences	Evaluation (Including Consideration of Environmental Measures and Additional Mitigation)	Preliminary Assessment of Tolerability of Residual Risk
		include the development of a fire management plan in consultation with the relevant fire authorities. This plan will include measures such as avoiding using construction machinery on high-risk days, reducing fuel loads directly near infrastructure, having fire extinguishers onsite, ensuring construction workers are trained for emergency situations and running exercises with the emergency services to ensure they are familiar with the Proposed Development. These measures will be captured as part of the oCEMP and reduce the likelihood of the risk event from occurring, such that with these measures in place, the risk is considered to be ALARP.	
Risks associated with onsite activities, such as dropping equipment or falls from working at height	Falling equipment or falls could result in harm to human health receptors.	All works will be undertaken in accordance with relevant legislation, standards and guidance, including the CDM Regulations 2015, and appropriate risk assessments and method statements will be prepared before the commencement of specific activities during the construction phase. All plant and equipment, such as cranes and other lifting equipment, will be maintained in line with the manufacturer's recommendations and operated by suitably qualified workers. All works at height will be in line with The Lifting Operations and Lifting	Tolerable (Not Significant)

Risk Event	Potential Impacts and Consequences	Evaluation (Including Consideration of Environmental Measures and Additional Mitigation)	Preliminary Assessment of Tolerability of Residual Risk
		Equipment Regulations 1998 and The Working at Height Regulations 2005. Appropriate bases will be used for the associated plant (e.g. hardstanding). This will be captured as part of the Construction Phase Plan, required by the CDM Regulations 2015. These measures will be secured as part of the oCEMP and reduce the likelihood of the risk event from occurring, such that with these measures in place, the risk is considered to be ALARP.	
Utilities/services strike	Fire and/or explosion or release of harmful gas, which could result in harm to human health receptors or cause harm/damage to ecological, water environment or historical/cultural receptors.	During construction, working areas will be temporarily secured with restricted access so that only suitably qualified workers are present. Works to confirm the location of utilities will be undertaken before the commencement of activities in liaison with the relevant operators. Good practice working measures will be put in place in accordance with the CDM Regulations 2015, such as the preparation of risk assessments and method statements, including making workers aware of the location of utilities and their easements where works are undertaken close to utilities. In addition, relevant HSE guidance will be adhered to, including Avoiding danger from underground services. These measures will be implemented as part of the oCEMP and reduce the likelihood of the risk event from occurring, such that with	Tolerable (Not Significant)

Risk Event	Potential Impacts and Consequences	Evaluation (Including Consideration of Environmental Measures and Additional Mitigation)	Preliminary Assessment of Tolerability of Residual Risk
		these measures in place, the risk is considered to be ALARP.	
Subsidence and unstable ground	Ground subsidence or unstable ground could lead to landslides or structural collapse, which could result in harm to human health receptors or cause harm/damage to ecological, water environment or historical/cultural receptors.	Detailed ground investigations will be undertaken post-consent to confirm the geotechnical properties of the underlying ground in line with relevant standards and guidance, such as British Standard 3930:2015 and BSEN1997: Part 2: 2007 Eurocode 7. All earthworks and foundation design will be in accordance with national standards and guidance, including British Standard 6031:2009: Code of Practice for Earthworks and Building Regulations Approved Document A - Structure. Appropriate measures to address unstable ground / geotechnical hazards, including temporary works (such as the shoring of excavations) will be implemented. These measures will be implemented as part of the oCEMP and reduce the likelihood of the risk event from occurring, such that with these measures in place, the risk is considered to be ALARP.	Tolerable (Not Significant)
UXO	Encountering UXO could result in harm to human health receptors or cause	In line with CIRIA 'Unexploded ordnance (UXO) A guide for the construction industry (C681)'[41], potential risks of discovering UXO will be communicated to construction workers, with the provision of safety training given. Safety	Tolerable (Not Significant)

[41] CIRIA (2009) Unexploded ordnance (UXO) A guide for the construction industry (C681).

Risk Event	Potential Impacts and Consequences	Evaluation (Including Consideration of Environmental Measures and Additional Mitigation)	Preliminary Assessment of Tolerability of Residual Risk
	harm/damage to ecological, water environment or historical/cultural receptors.	monitoring will be adopted where required. These measures will be included within the oCEMP and reduce the likelihood of the risk event from occurring, such that with these measures in place, the risk is considered to be ALARP.	
Chemical release	Release of chemicals could result in harm to human health receptors or cause harm/damage to ecological or water environment receptors.	Chemicals required for construction (such as those associated with cleaning equipment for commissioning) will be stored within the construction compounds. The storage facilities will be designed to meet the relevant regulations and standards, such as the Control of Substances Hazardous to Human Health Regulations 2002. All handling, storage and disposal of chemicals will also be undertaken in accordance with these relevant regulations and standards. These measures will be implemented as part of the oCEMP and reduce the likelihood of the risk event from occurring, such that with these measures in place, the risk is considered to be ALARP.	Tolerable (Not Significant)

Operational and Maintenance Phase

Assessment of Shortlisted Risk Events

20.8.3 The risk events ‘scoped in’ for further assessment that are relevant to the operational and maintenance phase are set out in **Table 20-7**.

Table 20-7: Further Assessment of Risk Events (Operational and Maintenance Phase)

Risk Event	Potential Impacts and Consequences	Evaluation (Including Consideration of Environmental Measures and Additional Mitigation)	Preliminary Assessment of Tolerability of Residual Risk
Aviation collision	Collision could result in harm to human health receptors. Such a collision could also trigger a 'knock-on' effect in relation to fire or turbine collapse.	Liaison has and will continue to be undertaken with the aerodrome operators, which have been identified to be potentially affected by the Proposed Development (as outlined in **Chapter 19: Aviation and Radar**). Given the potential risks, additional mitigation has been identified to be required at this stage, including agreement on the means of mitigation (see further details in **Chapter 19: Aviation and Radar**). The Proposed Development is also being designed in accordance with the appropriate aviation lighting requirements and the aviation lighting strategy will be agreed with the Civil Aviation Authority. These measures will be secured within the Aviation Lighting Strategy and reduce the likelihood of the risk event from occurring, such that with these measures in place, the risk is considered to be ALARP.	Tolerable (if ALARP) (Not Significant)
Fire	Fires could result in harm to human health receptors. Fires could also start wildfires,	Once completed, the Proposed Development will introduce ignition sources (the electrical and mechanical components of the wind turbines) alongside combustible materials (such as fuels).	Tolerable (if ALARP) (Not Significant)

Risk Event	Potential Impacts and Consequences	Evaluation (Including Consideration of Environmental Measures and Additional Mitigation)	Preliminary Assessment of Tolerability of Residual Risk
	causing harm/ damage to human health, ecological, water environment or historical/cultural receptors.	The wind turbines will be fitted with an active fire protection system that will detect flames, heat, gas, and smoke, alert personnel and rescue services and activate fire suppression or extinguishing systems. All operational plant will be designed and installed in line with relevant legislation, standards and guidance, such as the Electrical Equipment (Safety) Regulations 2016 and Electricity Safety, Quality and Continuity (Amendment) Regulations 2006. The wind turbines will have a lightning protection system. The blade tip will be made from non-conductive material and there will be lightning receptors near the end of the blade with a lightning cable running through the blade and into the hub /nacelle /tower/foundation. The system will also measure the strength of a lightning strike and aid in the detection of potential damage. Throughout the operation and maintenance phase, there will be regular checks and inspections of the wind turbines and other onsite plant, in conjunction with remote monitoring and alarm systems which will be relayed to a centralised control room facility.	

Risk Event	Potential Impacts and Consequences	Evaluation (Including Consideration of Environmental Measures and Additional Mitigation)	Preliminary Assessment of Tolerability of Residual Risk
		Given the potential risk of fire and the habitats present, additional mitigation has been identified to be required. Additional mitigation includes regular risk assessment of fire/wildfire risk, drawing on the principles of DEFRA's wildlife management plan guidance[42]. Continued engagement with fire authorities and development/review of the fire management plan. This plan will include measures such as avoiding using operational and maintenance machinery on high risk days, reducing fuel loads directly near infrastructure, having fire extinguishers onsite, ensuring operational and maintenance workers are trained for emergency situations and ongoing exercises with emergency services to ensure they are familiar with the Proposed Development. These measures will be secured within the oOEMP and reduce the likelihood of the risk event from occurring, such that with these measures in place, the risk is considered to be ALARP.	

[42] https://www.gov.uk/government/publications/wildfire-management-plan.

Risk Event	Potential Impacts and Consequences	Evaluation (Including Consideration of Environmental Measures and Additional Mitigation)	Preliminary Assessment of Tolerability of Residual Risk
Risks associated with onsite activities, such as dropping equipment or falls from working at height	Falling equipment or falls could result in harm to human health receptors.	All operational and maintenance works will be undertaken in accordance with relevant legislation, standards and guidance, such as The Lifting Operations and Lifting Equipment Regulations 1998 and The Working at Height Regulations 2005, and appropriate method statements and risk assessments will be prepared before the commencement of specific activities during the operation and maintenance phase. All plant and equipment, such as cranes and other lifting equipment, will be maintained in line with the manufacturer's recommendations and operated by suitably qualified workers. Appropriate bases will be used for the associated plant (e.g. hardstanding). These measures will be secured as part of the oCEMP and reduce the likelihood of the risk event from occurring, such that with these measures in place, the risk is considered to be ALARP.	Tolerable (Not Significant)
Chemical release	Release of chemicals could result in harm to human health receptors or cause harm/damage to ecological or water environment receptors.	Chemicals required for operation and maintenance (such as lubricants for turbine operation) will be stored within the substation compound. The storage facilities will be designed to meet the relevant regulations and standards, such as the Control of Substances Hazardous to Human Health 2002 and	Tolerable (Not Significant)

Risk Event	Potential Impacts and Consequences	Evaluation (Including Consideration of Environmental Measures and Additional Mitigation)	Preliminary Assessment of Tolerability of Residual Risk
		associated HSE guidance. All handling, storage and disposal of chemicals will also be undertaken in accordance with these relevant regulations and standards. These measures will be implemented as part of the oOEMP and reduce the likelihood of the risk event from occurring, such that with these measures in place, the risk is considered to be ALARP.	
Ice throw	Ice throw is the process of ice falling or being launched from the blades of a wind turbine when turning. This has the potential to cause harm to human health receptors.	The wind turbine control system will connect to sensors on the blades, which will detect the buildup of ice and automatically prevent the turbines from spinning when ice has built up on the turbine. Throughout the operation and maintenance phase, there will be regular checks and inspections of the wind turbines, in conjunction with remote monitoring and alarm systems which will be relayed to a centralised control room facility. Onsite operation and maintenance workers will be trained regarding the potential for ice throw. Ice risk conditions will be monitored and public notices will be displayed at access points (such as on the Pennine Way within the Turbine Area), alerting members of the public where there is a possible risk of ice throw due to weather conditions. These measures will be secured within the	Tolerable (Not Significant)

Risk Event	Potential Impacts and Consequences	Evaluation (Including Consideration of Environmental Measures and Additional Mitigation)	Preliminary Assessment of Tolerability of Residual Risk
		oOEMP and reduce the likelihood of the risk event from occurring, such that with these measures in place, the risk is considered to be ALARP.	
Wind turbine collapse	Once completed and operational, wind turbines can collapse due to extreme wind, aeroelastic effects as well as issues with the structural integrity of the columns. This has the potential to cause harm to human health receptors.	The wind turbines are set back from the Pennine Way that crosses the Turbine Area based on a topple distance incorporated for safety. During extreme gusts of wind, the wind turbine control system will move the blades to feather or point into the wind to reduce their surface area and, if required, lock the blade positions and shut down the turbines. The detailed design of the wind turbines will be informed by a detailed analysis to minimise any aeroelastic effects and appropriate measures will be implemented, such as ensuring that there is enough damping for the different modes and that there is no resonance. The wind turbines will be constructed to relevant engineering standards, including British Standard EN 61400, which relates to turbine structural components. Throughout the operation and maintenance phase, there will be regular checks and inspections of the wind turbines, in conjunction with remote monitoring and alarm systems which will be relayed to a centralised control room facility. These measures will be secured as part of the oOEMP and	Tolerable (Not Significant)

Risk Event	Potential Impacts and Consequences	Evaluation (Including Consideration of Environmental Measures and Additional Mitigation)	Preliminary Assessment of Tolerability of Residual Risk
		reduce the likelihood of the risk event from occurring, such that with these measures in place, the risk is considered to be ALARP.	

Decommissioning Phase

20.8.4 Decommissioning effects will be similar to the construction phase, and would be no worse, provided that the environmental measures identified above are adopted. These measures, similar to those in the construction phase, will be included within a Decommissioning Management Plan (DEMP) and other management plans. As such, the residual risks during this phase are all considered to be Tolerable (Not Significant).

Next Steps

20.8.5 Further baseline data will be collected, particularly in relation to Major Accident Hazard Pipelines and Major Accident Hazard Sites and any associated Consultation Zones and ground stability hazards.

20.8.6 Further assessment of the design as it is refined will be undertaken to ensure that the environmental measures identified reflect the final design. Additional mitigation will be developed and refined as required.

20.9 Conclusions

20.9.1 A summary of the Preliminary Assessment for Major Accidents and Disasters is provided in **Table 20-8**.

Table 20-8: Summary of Preliminary Assessment

Risk Event	Additional Mitigation	Residual Risk
Construction Phase		
Accident involving high-consequence dangerous goods	Additional mitigation to be included within the oCTMP – further details are provided in **Chapter 14: Transport and Access** and **Appendix 14-2**.	Tolerable (if ALARP) **(Not Significant)**
Accidental fire or explosion at an onshore Major Accident Hazard Pipeline	n/a	Tolerable **(Not Significant)**
Fire/wildfire	Regular risk assessment of fire/wildfire risk, drawing on the principles of DEFRA's wildlife management plan guidance. Early and regular engagement with the relevant fire authorities and the development of a fire management plan.	Tolerable (if ALARP) **(Not Significant)**
Risks associated with onsite activities, such as dropping equipment or falls from working at height	n/a	Tolerable **(Not Significant)**
Utilities/services strike	n/a	Tolerable **(Not Significant)**
Subsidence and unstable ground	n/a	Tolerable **(Not Significant)**
UXO	n/a	Tolerable **(Not Significant)**

Risk Event	Additional Mitigation	Residual Risk
Chemical release	n/a	Tolerable **(Not Significant)**
Operation and Maintenance Phase		
Aviation collision	n/a	Tolerable **(Not Significant)**
Fire/wildfire	Regular risk assessment of fire/wildfire risk, drawing on the principles of DEFRA's wildlife management plan guidance. Continued engagement with the relevant fire authorities and the development/review of the fire management plan.	Tolerable (if ALARP) **(Not Significant)**
Risks associated with onsite activities, such as dropping equipment or falls from working at height	n/a	Tolerable **(Not Significant)**
Chemical release	n/a	Tolerable **(Not Significant)**
Ice throw	n/a	Tolerable **(Not Significant)**
Wind turbine collapse	n/a	Tolerable **(Not Significant)**
Decommissioning Phase		
Refer to the construction phase assessment conclusions set out above.		

Calderdale
energy park