

A12 Chelmsford to A120 widening scheme

TR010060

6.3 ENVIRONMENTAL STATEMENT

APPENDIX 5.3 MAJOR ACCIDENTS AND DISASTERS

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ENVIRONMENTAL STATEMENT APPENDIX 5.3 MAJOR ACCIDENTS AND DISASTERS

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CONTENTS

1	Major accidents and disasters	2
1.1	Introduction	2
1.2	Methodology	2
1.3	Risk assessment.....	4
	References	9

LIST OF TABLES

Table 1.1	Major accidents and disasters screening matrix	3
Table 1.2	Major accidents and disasters risk assessment.....	5

1 Major accidents and disasters

1.1 Introduction

- 1.1.1 A disaster is defined as a sudden, catastrophic event that can result in serious damage to human welfare or the environment. A disaster can result in major disruption to society or communities and can result in economic and environmental losses. Disasters can be caused by both natural processes and human actions.
- 1.1.2 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') require that risks due to accidents and disasters be considered within the Environmental Statement. This appendix provides a risk assessment of the major accidents and disasters that could affect the proposed scheme, and where these are being reported in the Environmental Statement and mitigated.

1.2 Methodology

- 1.2.1 A screening matrix (Table 1.1) has been completed detailing a long list of major accidents and disasters that could reasonably occur. This long list has been compiled using information from the International Federation of Red Cross and Red Crescent Societies website (2021) and National Risk Register (NRR) of Civil Emergencies (Cabinet Office, 2020).
- 1.2.2 The screening matrix considers the proposed scheme's location and intended land use to determine if it is at risk from a major accident or disaster. For example, as the proposed scheme would be located near water bodies, the location presents a potential risk from major flooding. Likewise, as the proposed scheme would be used as a transport route, the risk of a major transport accident exists. Where potential risks were identified, these were taken forward for further consideration.
- 1.2.3 Accidents and disasters requiring further consideration were subject to a more detailed risk assessment (Table 1.2). This looked at the probability of an event occurring, and the consequence/effect if an event did occur. Probabilities of event occurrence were obtained from the NRR, considering the local context of the proposed scheme and future climate change (see Chapter 15: Climate, of the Environmental Statement [TR010060/APP/6.1]). These factors were used to determine if an event presented a significant risk and how this is considered in the environmental assessment. In this instance, a significant risk is one with the potential to cause loss of life or long-lasting/permanent environmental damage and would require a response beyond existing response measures in place.

Table 1.1 Major accidents and disasters screening matrix

Accident/disaster	Location risk	Land-use risk	Further consideration required
Biological hazards: epidemics	x	x	x
Biological hazards: animal and insect infestation	x	x	x
Earthquakes	x	x	x
Mass movements/ground hazards	✓	x	✓
Tsunamis	x	x	x
Volcanic eruptions	x	x	x
Drought	x	x	x
Heatwaves	✓	x	✓
Wildfires	x	x	x
Inland floods	✓	x	✓
Coastal floods	x	x	x
Tropical storms	x	x	x
Storms and gales	✓	x	✓
Industrial accidents	x	✓	✓
Transport accidents	✓	✓	✓
Famine	x	x	x
Displaced populations	x	x	x
Terrorist attacks	x	x	x
Cyber attacks	x	x	x
Public disorder	x	x	x
Critical infrastructure failure	x	✓	✓
Heavy snowfall/low temperatures	✓	x	✓
Armed conflict/complex emergency	x	x	x

Bold text indicates major accidents or disasters requiring further consideration due to either the location of the proposed scheme or its intended use

1.3 Risk assessment

- 1.3.1 The risk assessment (Table 1.2) has been used to screen and scope potential environmental impacts from major accidents and disasters.
- 1.3.2 This shows how risks are being managed through the scheme design or reported and mitigated within other areas of the environmental assessment (e.g. climate change adaptation). Major accidents and disasters have therefore not been scoped into the Environmental Statement as an aspect chapter but have been reported on within relevant aspects. The scheme design has considered the potential effects associated with accidents and disasters, with mitigation embedded into the design where required.

Table 1.2 Major accidents and disasters risk assessment

Yellow shading: risks considered within the environmental assessment; green shading: risks that are not considered further

Event	Likelihood	Consequence	Further considerations
Mass movements/ ground hazards	A risk assessment was undertaken to inform the geotechnical design of the proposed scheme. This identified several ground hazards which are 'probable' or 'likely' to occur, including collapsible and compressible ground.	Subsidence and other ground hazards can occur rapidly with little warning. They can cause damage to infrastructure, disruption to the traffic network, and casualties and fatalities. Depending on the nature of the incident, environmental damage can occur through release of contaminants and opening source-pathway-receptor linkages.	Geophysical hazards have been considered in the scheme design. Ground investigations have been undertaken to assess the potential hazards and risks associated with the ground conditions. The results of the ground investigations have factored into the geotechnical design process. Geophysical hazards have therefore not been considered further in terms of major accidents and disasters.
Heatwaves	The NRR probability of a heatwave occurring in the next year is between 25 in 500 and 125 in 500*. Summer temperatures are predicted to increase in the UK due to climate change, potentially increasing the likelihood of this event occurring.	Hot weather increases the risk of tarmac melting and technology overheating. This could result in unsafe driving conditions, potentially leading to accidents. Hot temperatures could also result in increased driver stress, increasing the likelihood of an accident occurring. Environmental damage could occur if a crash resulted in discharge of contaminants (e.g. if an oil tanker crashed).	The UK Met Office has a system in place for providing warnings of extreme weather, which reduces the risk of drivers driving in extreme weather. There is a minor risk of high temperatures damaging the road surface and technology, however, the likelihood of this resulting in a catastrophic event is considered unlikely. Heatwaves have therefore not been considered further in terms of major accidents and disasters.

Event	Likelihood	Consequence	Further considerations
Storms and gales	The NRR probability of a storm/gale occurring in the next year is between 25 in 500 and 125 in 500*. It is uncertain if wind speeds are likely to increase or decrease in the east of England due to climate change.	High wind speeds can fell trees and man-made structures. This can result in property damage, disruption to the transport network, disruption to critical infrastructure, and casualties and fatalities. Large-scale events have the potential to impact at a regional or even national scale.	High wind speeds have caused historic disruption to transport networks in the east of England, and there is potential for future events to impact the A12. The proposed scheme has been designed in accordance with best practice (BS EN 1991-1-4:2005 – Actions on Structures (covering wind) ¹ and the associated UK National Annex ²), and no further measures taken. Storms and gales have therefore not been considered further in terms of major accidents and disasters.
Inland floods	The NRR probability of inland flooding occurring in the next year is between 5 in 500 and 25 in 500*. Locally, the proposed scheme would be located in areas of flood zone 3 (1 in 100-year event). Winters are predicted to get wetter in the UK due to climate change, potentially increasing the likelihood of this event occurring.	Large-scale flooding events can result in damage to property, disruption of the transport network, and casualties and fatalities. There can also be impacts on local communities if they are not equipped to deal with a large-scale event in their area. Depending on the nature of the event, environmental damage can occur through release of contaminants and opening source-pathway-receptor linkages. The magnitude and severity of an event could increase due to future climate change and land use change (e.g. development within floodplain).	The proposed scheme would involve development in floodplain. There are also areas at high risk from surface water flooding. The scheme is therefore at risk from a flood event and potentially increases the risk of flooding elsewhere. This problem is likely to be exacerbated by future climate change. As such, the Flood Risk Assessment, in Appendix 14.5 of the Environmental Statement [TR010060/APP/6.3], has included an allowance for climate change and proposed mitigation measures as required to reduce potential future risks. Inland floods have been considered in Chapter 14: Road drainage and the water environment of the Environmental Statement [TR010060/APP/6.1].

¹ BSI (2005). BS EN 1991-1-4:2005+A1:2010: Eurocode 1. Actions on structures. General actions. Wind actions.

² BSI (2005). NA to BS EN 1991-1-4:2005+A1:2010: UK National Annex to Eurocode 1. Actions on structures. General actions. Wind actions

Event	Likelihood	Consequence	Further considerations
Transport accidents	The NRR probability of a major transport accident occurring in the next year is less than 1 in 500*. This probability could increase (e.g. due to future stress on the network) or decrease (e.g. through advances in technology) beyond five years.	Major accidents can result in fatalities, casualties and damage to infrastructure, causing disruption to the network. There can also be impacts on local communities if they are not equipped to deal with a large-scale event in their area. Environmental damage could occur if a crash resulted in discharge of contaminants (e.g. if an oil tanker crashed).	Although accidents are likely to take place on the A12, these are not likely to occur at a scale that would be considered a national or regional disaster. The proposed scheme is also being designed to increase capacity and improve safety, which should reduce the probability of an incident occurring. Traffic accidents would be managed through existing emergency service procedures and would be unlikely to need a coordinated government response. Traffic accidents have therefore not been considered further in terms of major accidents and disasters.
Critical infrastructure failure	The NRR probability of a widespread electricity failure occurring in the next year is between 5 in 500 and 25 in 500*. Excluding an event in August 2019, this has never occurred in the UK before; however, the risk could increase due to the increased risk of severe weather.	The A12 is a strategic route that relies on powered technology, such as variable message signs and traffic signals, to allow safe operation of the road. A critical electricity failure could disrupt this technology, resulting in potential casualties and fatalities due to road accidents.	The Department for Business, Energy & Industrial Strategy works closely with industry and government to provide contingency planning in the event of a widespread electricity shutdown occurring. Existing measures are in place to manage this event, and it is therefore not considered further in terms of major accidents and disasters.

Event	Likelihood	Consequence	Further considerations
Heavy snowfall/ low temperatures	The NRR probability of heavy snowfall occurring in the next year is between 25 in 500 and 125 in 500*. Winters are predicted to get milder in the UK due to climate change, potentially reducing the likelihood of this event occurring.	Heavy snowfall can result in serious disruption to the transport network, resulting in road closures and increasing the hazard of vehicle accidents. This has the potential to result in casualties and fatalities. Environmental damage could occur if a crash resulted in discharge of contaminants (e.g. if an oil tanker crashed).	The UK Met Office has a system in place for providing warnings of extreme weather. National Highways and local authorities operate gritting lorries and manage operations for removing snow. These existing mitigation measures reduce the risk of accidents occurring. Although a residual risk remains for an accident to occur, the chance of one resulting in catastrophic damage to human health or the environment is considered unlikely. As such, snowstorms have not been considered further in terms of major accidents and disasters.
Industrial accidents	The NRR probability of an industrial accident occurring in the next year is between 5 in 500 and 25 in 500*. For the proposed scheme, the risk from industrial accidents is specific to high pressure gas pipelines.	Construction of the proposed scheme would require the diversion of a high pressure gas main, which could be subject to failure – for example through corrosion and leakage – leading to the release of gas conveyed through the pipeline into the environment.	The risk of failure would be managed through designing and constructing the pipeline to relevant design standards from both Cadent Gas Limited and the Health and Safety Executive, and through undertaking risk assessments to minimise the probability of such an event occurring. The National Emergency Plan: Downstream Gas and Electricity (Department for Business, Energy & Industrial Strategy, 2019) sets out the response arrangements that would be implemented in the event of a gas emergency relating to a failure of utilities infrastructure. As such, industrial accidents have not been considered further in terms of major accidents and disasters.

** NRR probabilities represent the likelihood of the reasonable worst case scenario of the risk occurring in the next year. This means that they represent the worst plausible manifestation of that particular risk once highly unlikely variations have been discounted.*

References

Cabinet Office (2020). National Risk Register 2020. Available at:
<https://www.gov.uk/government/publications/national-risk-register-2020>. Accessed March 2022.

Department for Business, Energy & Industrial Strategy (2019). National Emergency Plan for downstream gas and electricity. Available at:
<https://www.gov.uk/government/publications/national-emergency-plan-downstream-gas-and-electricity-2016>. Accessed March 2022.

International Federation of Red Cross and Red Crescent Societies (2021). Website: What is a disaster?