

A46 Newark Bypass

TR010065/APP/6.3

6.3 Environmental Statement

Appendix 4.2 Assessment of Major Accidents and Natural Disasters

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and
Procedure) Regulations 2009

Volume 6

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Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms
and Procedure) Regulations 2009**

A46 Newark Bypass

Development Consent Order 202[x]

ENVIRONMENTAL STATEMENT

**APPENDIX 4.2 ASSESSMENT OF MAJOR ACCIDENTS AND NATURAL
DISASTERS**

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1 Assessment of Major Accidents and Natural Disasters

1.1 Introduction

- 1.1.1 This Technical Appendix presents the assessment undertaken for major accidents and disasters to support the Environmental Statement (ES) **(TR010065/APP/6.1)** submitted as part of the development consent application for the A46 Newark Bypass (the Scheme).
- 1.1.2 The Infrastructure Planning (EIA) Regulations 2017 (as amended)¹ require an assessment of *‘the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned’*.
- 1.1.3 The scope of this assessment covers:
- The vulnerability of the Scheme to risks of major accidents and/or disasters.
 - Any consequential changes in the predicted effects of the Scheme on environmental factors.
- 1.1.4 This requirement derives from Directive 2011/92/EU², as amended by Directive 2014/52/EU³. The overarching objective of this assessment is to ensure that appropriate precautionary actions have been identified and integrated into the design and execution of the Scheme, including a consideration of the likelihood of increased frequency of extreme weather events as a result of climate change, to address the vulnerability to major accidents and/or natural disasters.

¹ HMSO (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [online] available at: [The Infrastructure Planning \(Environmental Impact Assessment\) Regulations 2017 \(legislation.gov.uk\)](https://www.legislation.gov.uk) (last accessed December 2023).

² Official Journal of the European Union (2011). Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) [online] available at: [EUR-Lex - 32011L0092 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu) (last accessed December 2023).

³ Official Journal of European Union (2011). Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment [online] available at: [EUR-Lex - 32014L0052 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu) (last accessed December 2023).

1.2 Definitions

1.2.1 The following Scheme-specific definitions related to the assessment of major accidents and disasters (major events) have been identified, based on professional judgement:

- **Major accident:** An event or situation caused by humans that threatens immediate or delayed serious and far-reaching harm to human health, welfare and/or environment.
- **Natural disaster:** A naturally occurring phenomenon such as an extreme weather event or ground-related hazard events with the potential to cause an event or situation that threatens immediate or delayed serious and far-reaching harm to human health, welfare and/or the environment.

1.3 Legislation and policy

1.3.1 National legislation and policy associated with major events which may affect the scheme, including their relevance to the Scheme, are presented below.

UK national policy

National Policy Statement for National Networks⁴

1.3.2 The National Policy Statement for National Networks (NPSNN) sets out the policy which the Scheme should comply with. It is also the basis for informing a judgement on the impacts of the Scheme, for example whether the Scheme is consistent with the requirements of the NPSNN. Compliance of the Scheme with the NPSNN is detailed within the NPSNN Accordance Table **(TR010065/APP/7.2)**.

1.3.3 A draft NPSNN was published for consultation in March 2023. The consultation period ended in June 2023. The draft NPSNN may be subject to change following the consultation before being published in its designated form. Although this is currently in draft it has been considered in respect of the scheme and the Draft NPSNN Accordance Table **(TR010065/APP/7.3)** summarises compliance of the Scheme with the draft NPSNN.

Climate Change

1.3.4 The NPSNN recognises that climate change could result in *‘an increased risk of flooding, drought, heatwaves, intense rainfall events*

⁴ Department for Transport (2014). National Policy Statement for National Networks [online] available at: [National policy statement for national networks - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/292222/national-policy-statement-for-national-networks.pdf) (last accessed December 2023)

and other extreme events such as storms and wildfires, as well as rising sea levels’.

1.3.5 In particular, it is mentioned that ‘4.38... *New developments should be planned to avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the provision of green infrastructure.’*

1.3.6 Regarding the use of climate change forecasts when designing national networks, the NPSNN states that ‘4.41... *Where transport infrastructure has safety-critical elements and the design life of the asset is 60 years or greater, the applicant should apply the UK Climate Projections 2009 (UKCP09) high emissions scenario (high impact, low likelihood) against the 2080 projections at the 50% probability level.’*

Security

1.3.7 The NPSNN sets out responsibilities and policy in relation to national networks security as ‘4.74... *The Department for Transport acts as the Sector Sponsor Department for the national networks and in this capacity has lead responsibility for security matters in that sector and for directing the security approach to be taken. The Department works closely with Government agencies including the Centre for the Protection of National Infrastructure (CPNI) to reduce the vulnerability of the most ‘critical’ infrastructure assets in the sector to terrorism and other national security threats.’*

1.3.8 Additionally, ‘4.75... *Government policy is to ensure that, where possible, proportionate protective security measures are designed into new infrastructure projects at an early stage in the project development. Where applications for development consent for infrastructure covered by this NPS relate to potentially ‘critical’ infrastructure, there may be national security consideration.’*

National Planning Policy Framework (NPPF)⁵

1.3.9 The NPPF promotes health and safe communities. Paragraph 101 states that policies and decisions should promote public safety and take into account wider security and defence requirements by:

- a) Anticipating and addressing possible malicious threats and natural hazards, especially in locations where large numbers of people are expected to congregate...the layout and design of developments, should be informed by the most up-to-date information available from the police and other agencies about the nature of potential threats and their implications. This includes appropriate and proportionate steps

⁵ Department for Levelling Up, Housing & Communities (December 2023). National Planning Policy Framework [online] available at: [National Planning Policy Framework \(publishing.service.gov.uk\)](https://www.gov.uk/government/publications/national-planning-policy-framework) (last accessed March 2024).

- that can be taken to reduce vulnerability, increase resilience and ensure public safety and security; and
- b) Recognising and supporting development required for operational defence and security purposes, and ensuring that operational sites are not affected adversely by the impact of other development proposed in the area.

UK legislation

The Control of Major Accident Hazards Regulations (COMAH) 2015⁶

- 1.3.10 The COMAH Regulations 2015 upholds occupational health and safety that employers should have towards employees and the public in Great Britain. There are no COMAH sites within influencing distance of the Scheme.

The Workplace (Health, Safety and Welfare) Regulations 1992⁷

- 1.3.11 The Workplace (Health, Safety and Welfare) Regulations 1992 states the employer's duty to manage health and safety and assess and manage risks to their employees.

The Pipelines Safety Regulations 1996⁸

- 1.3.12 The Pipelines Safety Regulations 1996 are the UK's health and safety legislations concerning the safety of pipelines, ensuring pipelines are designed and constructed properly and operated safely.

Gas Safety (Management) Regulations 1996⁹

- 1.3.13 The Gas Safety (Management) Regulations 1996 concentrates on the transportation of natural gas (methane) through pipes to domestic and other consumers, covering four main areas:
- a) The safe management of gas flow through a network, minimising the risk of a gas supply emergency.
 - b) Arrangements for dealing with supply emergencies.
 - c) Arrangements for dealing with reported gas escapes and gas incidents.
 - d) Gas composition.

⁶ The Stationery Office (2015). The Control of Major Accident Hazards Regulations 2015 [online] available at: [The Control of Major Accident Hazards Regulations 2015 \(legislation.gov.uk\)](#) (last accessed December 2023).

⁷ HMSO (1992). The Workplace (Health, Safety and Welfare) Regulations 1992 [online] available at: [The Workplace \(Health, Safety and Welfare\) Regulations 1992 \(legislation.gov.uk\)](#) (last accessed December 2023).

⁸ HMSO (1996). The Pipelines Safety Regulations 1996 [online] available at: [The Pipelines Safety Regulations 1996 \(legislation.gov.uk\)](#) (last accessed December 2023).

⁹ HMSO (1996). Gas Safety (Management) Regulations 1996 [online] available at: [Gas Safety \(Management\) Regulations 1996 \(legislation.gov.uk\)](#) (last accessed December 2023).

The Construction (Design and Management) Regulations 2015¹⁰

- 1.3.14 The Construction (Design and Management) (CDM) Regulations 2015 cover the management of health, safety and welfare when carrying out construction schemes.

1.4 Methodology

- 1.4.1 The assessment methodology has a four stage approach to identify, screen and assess the Scheme-specific major events which may occur during construction and operation. These stages include:

- Stage 1: Identification of major accidents and natural disasters
- Stage 2: Screening of long list of major events
- Stage 3: Further screening of major events within the long list
- Stage 4: Assessment of shortlisted of major events

- 1.4.2 Further detail on each stage is explained below.

Stage 1: Identification of major accidents and natural disasters

- 1.4.3 For the purposes of this assessment, a long list of major accidents and natural disasters were identified through reviewing Scheme-specific risk registers and the following online information sources:

- The *UK Government's National Risk Register of Civil Emergencies*¹¹ which explains the UK's risks of major emergencies and provides resilience advice and guidance.
- The *Nottingham and Nottinghamshire Local Resilience Forum Community Risk Register*¹² which highlights risks that have the highest likelihood and potential to have significant impact and disruption to local communities in Nottinghamshire.

- 1.4.4 Each identified major event was then categorised within the following types of major accidents and natural disasters:

- Geological and ground-related disasters
- Hydrological disasters
- Meteorological disasters
- Space disasters
- Transport accidents

¹⁰ Health and Safety Executive (2015) The Construction (Design and Management) Regulations 2015 [online] available at: [Construction - Construction Design and Management Regulations 2015 \(hse.gov.uk\)](https://www.hse.gov.uk/construction/) (last accessed December 2023).

¹¹ Cabinet Office (2017). National Risk Register of Civil Engineers, 201 Edition [online] available at: [Withdrawn National Risk Register of Civil Emergencies – 2017 Edition - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/624422/National_Risk_Register_of_Civil_Emergencies_-_2017_Edition_-_GOV.UK.pdf) (last accessed December 2023).

¹² Nottingham and Nottinghamshire Local Resilience Forum (2018). Nottingham and Nottinghamshire Local Resilience Forum Community Risk Register [online] available at: [Community Risk Register \(np2020-ae8f.jlayershift.co.uk\)](https://www.layershift.co.uk/np2020-ae8f-jlayershift.co.uk) (last accessed December 2023).

- Engineering accidents and failures
 - Industrial accidents
 - Terrorism, crime, war and civil unrest
 - Disease
- 1.4.5 The Order Limits do not overlap with the British Sugar Factory (or any other) Major Accident Hazard Site. Furthermore, as part of their response to the statutory consultation, the Health and Safety Executive (HSE) confirmed that: “According to HSE’s records the proposed DCO application boundary for this Nationally Significant Infrastructure Project does not encroach on any Major Accident Hazard Site or Major Accident Hazard Pipeline. This is based on the Preliminary Red Line Boundary (RLB) as illustrated in, for example, A46 Newark Bypass General Arrangement Drawings.pdf (citizenspace.com). Based on the information in the A46 Newark Bypass Statutory Consultation Brochure.pdf (citizenspace.com), it is unlikely that HSE would advise against the development”.
- 1.4.6 Further consultation with HSE involved providing an update email following scheme design updates and completion of the assessment. HSE were emailed a summary of the assessment outcomes on 10 August 2023; this email confirmed that the Order Limits for the Scheme do not overlap with the British Sugar Factory (or any other) Major Accident Hazard Site or Major Accident Hazard Pipeline. Additionally, the staged approach for the assessment was detailed, with HSE being offered an opportunity to request for more detail if required.

Stage 2: Screening of long list of major events

- 1.4.7 Reference was made to guidance contained in Advice Note Eleven: Annex G – The Health and Safety Executive¹³, published by the Planning Inspectorate, to assess a major event’s likelihood occurring and the Scheme’s susceptibility to such an event.
- 1.4.8 Unlikely events due to their type or applicability to the Scheme, the Scheme’s characteristics, and/or the Scheme’s geographic location, were screened out.
- 1.4.9 Some major events, for example those relating to health and wellbeing in the workplace, are already safeguarded by the legislation presented in Section 1.3 of this report. The screening exercise therefore concluded that it was reasonable and proportionate to scope out operatives such as construction workers undertaking future Scheme maintenance activities. This is because health and wellbeing in the workplace would be safeguarded and protected through

¹³ The Planning Inspectorate (2017). Advice Note Eleven: Annex G – The Health and Safety Executive [online] available at: [Letter \(planninginspectorate.gov.uk\)](https://www.planninginspectorate.gov.uk) (last accessed December 2023).

legislation, thereby minimising the risk for major events to an acceptable level.

Stage 3: Further screening of major events within the long list

1.4.10 Stage 3 involves the screening of major events.

1.4.11 Factors considered in the further screening of major events included:

- Reasonably foreseeable major events may be very unlikely but there are likely to be examples of similar incidents affecting road schemes, or else near misses have occurred. Where they are not realistic, they are screened out.
- Events that have small consequences are considered as not major and therefore have been screened out of this assessment.
- The event's potential to interact with relevant environmental resources and receptors. Those that do not interact have been screened out.
- The event's capability to alter the impact associated with the topic assessments reported in Chapters 5-14 of the ES **(TR010065/APP/6.1)**. Events that do not alter the impact have been screened out.
- Events which are appropriately mitigated and/or managed enabling the risk to be reduced to an appropriate level have therefore been scoped out.
- Whether further mitigation (i.e. measures over and above those already embedded into the Scheme design or essential to mitigate adverse environmental effects) would be required to reduce their likelihood/risk and/or improve the Scheme's resilience to major events. Events which do not require further mitigation have been screened out.

1.4.12 Those considered to not be a major event were screened out, with justifications set out in Table 1-1 below. Where an event was considered to be major or further information or analysis was required, these events were screened in.

Stage 4: Assessment of shortlisted major events

1.4.13 The assessment findings concluded that the initial identification, screening and subsequent scoping of major events resulted in no requirement for these events to be assessed in detail at Stage 4.

1.5 Assessment outcomes

1.5.1 The outcomes of each stage of the major events assessment are presented in Table 1-1 below.

Table 1-1 Screening of major events relevant to the Scheme

ID	Stage 1: Identification		Stage 2: Screening		Stage 3: Further screening	Stage 4: Assessment
	Event	Reasonable worst consequences if event did occur	Relevant to Scheme?	Relevant receptors	Mitigation and/or management action	Requires assessment?
1	Avalanche	Experiencing an avalanche, earthquake or volcanic eruption within the Order limits could potentially harm life.	No – not considered relevant given the Scheme’s geographical location (not located in a geologically or volcanically active area).	N/A	N/A	N/A
2	Earthquake					
3	Volcanic eruption					
4	Landslide	Experiencing a landslide, sinkhole and/or unstable ground within the Order limits could potentially harm life.	Yes	<ul style="list-style-type: none"> • Geological receptors: Chapter 9 (Geology and Soils) of the ES (TR010065/APP/6.1). • Water resources: Chapter 13 (Road Drainage and Water Environment) of the ES (TR010065/APP/6.1) • Ecological receptors: Chapter 8 (Biodiversity) of the ES (TR010065/APP/6.1) and Appendices 8.1-8.14 of the ES Appendices (TR010065/APP/6.3). • Properties: Chapter 5 (Air Quality) of the ES (TR010065/APP/6.1) and Chapter 11 (Noise and Vibration) of the ES (TR010065/APP/6.1). • People, drivers and workers Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1). 	<p>The geotechnical and highways design has fundamentally been developed to take into account the risk of landslides.</p> <p>As outlined in the First Iteration Environmental Management Plan (EMP) (see commitment GS1 contained in Table 3-2 Register of Environmental Actions and Commitments (REAC), TR010065/APP/6.5), soil structure and quality will be protected to prevent degradation of soils both within the permanent and temporary development areas within the Order Limits. This includes:</p> <ul style="list-style-type: none"> • Making sure the completion of the works are in line with the site Soils Management Plan (which is developed using the Outline Soils Management Plan (OSMP) in Appendix B.3 of the First Iteration EMP (TR010065/APP/6.5) and secured through Requirement 3 of the draft DCO (TR010065/APP/3.1)) • The use of proprietary geotextile membrane to protect the existing ground condition where haul routes or site compounds / storage areas are located • Best practice is maintained when importation of topsoil is required for spreading on areas of newly constructed earthworks is required • Management of excavated topsoil and subsoils would be in line with the guidance provided within the OSMP (Appendix B.3 of the First Iteration EMP (TR010065/APP/6.5)). <p>When environmental mitigation is implemented, environmental resources and receptors would not be put at a greater risk as a consequence.</p>	No
5	Sinkhole					
6	Ground stability					
7	Landfill accident	An explosion could occur due to methane build-up, or collapse of the landfill resulting in a landslide. However, it more likely there would be failure of the lining system resulting in leachate, gas or waste release.	No – there are no excavation works proposed within 250m of the historical or active landfills, and as such accidents associated with landfills are not considered further in the assessment.	N/A	N/A	N/A

ID	Stage 1: Identification		Stage 2: Screening		Stage 3: Further screening	Stage 4: Assessment
	Event	Reasonable worst consequences if event did occur	Relevant to Scheme?	Relevant receptors	Mitigation and/or management action	Requires assessment?
8	Flooding	The construction of a new carriageway across a floodplain, between Farndon to Winthorpe, may result in potential flooding of the carriageway within a flood zone of the River Trent. This is a hazard for the end user and public.	Yes – large area of the scheme sits within Flood Zones 2 and 3.	<ul style="list-style-type: none"> Geological receptors: Chapter 9 (Geology and Soils) of the ES (TR010065/APP/6.1). Water resources: Chapter 13 (Road Drainage and Water Environment) of the ES (TR010065/APP/6.1). Aquatic environment and ecological receptors: Chapter 8 (Biodiversity) of the ES (TR010065/APP/6.1) and the Appendices 8.1-8.14 of the ES Appendices (TR010065/APP/6.3). Properties: Chapter 5 (Air Quality) of the ES (TR010065/APP/6.1) and Chapter 11 (Noise and Vibration) of the ES (TR010065/APP/6.1). People, drivers and workers: Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1). 	<p>To inform the Scheme development and the preparation of Appendix 13.2 (Flood Risk Assessment) of the ES Appendices (TR010065/APP/6.3), detailed flood modelling has been undertaken to identify, model and evaluate flood risk associated with the Scheme. This includes both temporary flood risk during the construction stage and permanent flood risk associated with the operation of the Scheme.</p> <p>The Scheme's vulnerability to flooding and potential to exacerbate flooding have been considered both during construction and operation. Appropriate mitigation measures are demonstrated in the modelling to mitigate flooding, including the use of floodplain compensation areas.</p> <p>Appropriate measures have been incorporated into the Scheme design to capture, control, manage, treat and discharge surface water.</p> <p>Allowances have also been made in the Scheme design for the effects of future climate change, as outlined in Appendix 13.2 (Flood Risk Assessment) of the ES Appendices (TR010065/APP/6.3).</p> <p>Collectively, these measures would appropriately manage potential flood risk associated with the Scheme.</p> <p>As outlined in the First Iteration EMP (REAC Commitment: RDWE10, Table 3-2 REAC, TR010065/APP/6.5), and Appendix 13.2 (Flood Risk Assessment) of the ES Appendices (TR010065/APP/6.3), the loss of the floodplain as a result of the Scheme will be compensated for. This will be done by providing floodplain compensation for the loss of floodplain storage, as outlined in Appendix 13.2 (Flood Risk Assessment) of the ES Appendices (TR010065/APP/6.3).</p>	No
9	Groundwater contamination event within Source Protection Zone	Drinking contaminated water can have the potential to adversely affect human health and ecologically sensitive receptors.	No – the scheme is not located within, or in proximity to, an Environment Agency designated groundwater Source Protection Zone, Drinking Water Protected Area or Drinking Water Safeguard Zone for groundwater (or surface water).	N/A	N/A	N/A
10	Tsunami or storm surge	Experiencing a tsunami or storm surge within the Order limits could potentially harm life.	No – geographically located at distance from the UK's coastline (approx. 60 kilometres).	N/A	N/A	N/A
11	Blizzard	Road users could become trapped on the highway.	Yes	<ul style="list-style-type: none"> People, drivers and workers: Chapter 12 (Population and 	The Scheme design has incorporated resilience measures to account for severe weather events. For	No

ID	Stage 1: Identification		Stage 2: Screening		Stage 3: Further screening	Stage 4: Assessment
	Event	Reasonable worst consequences if event did occur	Relevant to Scheme?	Relevant receptors	Mitigation and/or management action	Requires assessment?
12	Cyclonic storms	Highway infrastructure could become damaged, affecting journeys made by road users.		Human Health) of the ES (TR010065/APP/6.1) . <ul style="list-style-type: none"> Aquatic environment and ecological receptors: Chapter 8 (Biodiversity) of the ES (TR010065/APP/6.1) and Appendices 8.1-8.14 of the ES Appendices, (TR010065/APP/6.3). 	<p>example, the new highway has been designed to sit above the 1:100+ climate change flood level at Brownhills and Cattle Market junctions.</p> <p>As outlined in the First Iteration EMP (REAC commitment: G2, Table 3-2 REAC, TR010065/APP/6.5), certain operations such as earthworks are season and weather dependent. In these instances, the Principal Contractor would seek to extend the core working hours and/or days for such operations to take advantage of daylight hours, following consultation with the relevant local authority.</p> <p>No further measures are therefore considered to be required as part of the Scheme.</p>	
13	Thunderstorms	Thunderstorms could result in lightning strikes to elevated Scheme structures (such as bridges).				
14	Flash flooding	A flash flooding event as a result of heavy rainfall could potentially harm life.				
15	Hailstorms	Driving conditions could become difficult for road users.				
16	Droughts	Scheme design features could become dried out resulting in dust affecting road users, highway operatives and ecologically sensitive receptors.				
17	Heatwaves	Climatic conditions may change, with road infrastructure and ecologically sensitive receptors exposed to greater heat intensity and sunlight exposure.				
18	Tornadoes	Highway infrastructure could become damaged, affecting journeys made by road users.	No – uncommon in the UK and are much less destructive relative to those in other parts of the world.	N/A	N/A	N/A
19	Wildfires	Parts of the Scheme are in the vicinity of grassland that could be at risk of wildfire events during hot and dry periods (e.g. from vehicle incidents, deliberate arson or accidental causes). This potentially may cause harm to life and ecologically sensitive receptors.	Yes	<ul style="list-style-type: none"> Aquatic environment and ecological receptors: Chapter 8 (Biodiversity) of the ES (TR010065/APP/6.1) and Appendices 8.1-8.14 of the ES Appendices (TR010065/APP/6.3). Properties: Chapter 5 (Air Quality) of the ES (TR010065/APP/6.1) and Chapter 11 (Noise and Vibration) of the ES (TR010065/APP/6.1). People, drivers and workers: Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1). 	<p>A risk is presented to drivers. It's proximity and/or the spread of smoke across the highway may lead to road or land closures implemented by National Highways until the fire is controlled and extinguished by emergency response teams.</p> <p>The Scheme design has incorporated resilience measures to account for severe weather events as well as reduce the risk of car accidents that may trigger fires.</p> <p>As outlined in the First Iteration EMP (REAC Commitment: G2, Table 3-2 REAC, TR010065/APP/6.5), certain operations such as earthworks are season and weather dependent. In these instances, the Principal Contractor would seek to extend the core working hours and/or days for such operations to take advantage of daylight hours, following consultation with the relevant local authority.</p> <p>No further measures are therefore considered to be required as part of the Scheme.</p>	No

ID	Stage 1: Identification		Stage 2: Screening		Stage 3: Further screening	Stage 4: Assessment
	Event	Reasonable worst consequences if event did occur	Relevant to Scheme?	Relevant receptors	Mitigation and/or management action	Requires assessment?
20	Air quality events	Air pollution events that have the potential to adversely affect human health and ecologically sensitive receptors.	Yes	<ul style="list-style-type: none"> • Properties: Chapter 5 (Air Quality) of the ES (TR010065/APP/6.1). • Ecological receptors: Chapter 8 (Biodiversity) of the ES (TR010065/APP/6.1) and Appendices 8.1-8.14 of the ES Appendices (TR010065/APP/6.3). • People, drivers and workers: Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1). 	<p>Air quality events that occur due to atypical situations such as traffic incidents (pollution released during car fires) have not been considered as part of the environmental impact assessment (EIA) as they are short-term and not considered to be significant in a Major Event context.</p> <p>Accordingly, there is no requirement to consider and evaluate this event further.</p>	No
23	Road accidents	A worst case scenario involves a road collision occurring and loss of vehicular control resulting in death of those involved in the collision.	Yes	<ul style="list-style-type: none"> • Aquatic environment and ecological receptors: Chapter 8 (Biodiversity) of the ES (TR010065/APP/6.1) and Appendices 8.1-8.14 of the ES Appendices (TR010065/APP/6.3). • Geological receptors: Chapter 9 (Geology and Soils) of the ES (TR010065/APP/6.1). • People, drivers and workers Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1) and the Transport Assessment Report (TR010065/APP/7.5). • Water resources: Chapter 13 (Road Drainage and Water Environment) of the ES (TR010065/APP/6.1). 	<p>The Scheme aims to reduce existing accident rates on the road network by ensuring the Scheme has been designed in accordance with relevant design and safety standards included within the Design Manual for Roads and Bridges which is the primary design guide for all National Highway projects being designed or maintained.</p> <p>A drainage design has been incorporated within the Scheme to reduce the risk of accidental spillages arising from a road accident discharging into the water environment.</p> <p>The environmental risks posed by hazardous spillages because of road accidents have been considered within the EIA.</p> <p>As outlined in the First Iteration EMP (REAC Commitment: PHH1, Table 3-2 Register of Environmental Actions and Commitments, TR010065/APP/6.5) and the Outline Traffic Management Plan (TR010065/APP/7.7), traffic management will be designed and operated in accordance with Chapter 8 – Traffic Signs Manual (Traffic Safety Measures and Signs for Road Works and Temporary Situations) which will reduce the risk of a serious incident occurring. Temporary speed restrictions of 40mph or 50mph will also be applied to reduce the likelihood and severity of an incident.</p>	No
24	Rail accidents	A worst case scenario involves a rail collision occurring. This could lead to a possible derailment resulting in death of those involved in the collision.	Yes	<ul style="list-style-type: none"> • Aquatic environment and ecological receptors: Chapter 8 (Biodiversity) of the ES (TR010065/APP/6.1) and Appendices 8.1-8.14 of the ES Appendices (TR010065/APP/6.3). • People, drivers and workers: Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1). 	<p>The Scheme crosses two sections of the Nottingham to Lincoln Railway Line crossing and a section of the East Coast Mainline.</p> <p>The operational railway has been considered in the outline construction working methods and timing/phasing of activities.</p> <p>These working methods and phasing of activities are outlined in Chapter 2 (The Scheme) of the ES (TR010065/APP/6.1) and would be further developed</p>	No

ID	Stage 1: Identification		Stage 2: Screening		Stage 3: Further screening	Stage 4: Assessment
	Event	Reasonable worst consequences if event did occur	Relevant to Scheme?	Relevant receptors	Mitigation and/or management action	Requires assessment?
				Human Health) of the ES, (TR010065/APP/6.1) .	<p>by the Principal Contractor through the preparation of the Second Iteration EMP.</p> <p>Risk minimisation of operational rail accidents has been considered during the Scheme design-development. Design approval has been secured from Network Rail, and this accounts for Network Rail's specific requirements (e.g. horizontal and vertical clearances, and containment requirements on bridge parapets).</p> <p>The protective provisions with Network Rail within Schedule 9 of the draft DCO (TR010065/APP/3.1) allow Network Rail to specify any protective works which in its opinion are necessary to ensure the safety or stability of railway property or the continuation of that safe and efficient operation of the railway network.</p> <p>As outlined in the First Iteration EMP (REAC Commitment: G2, Table 3-2 REAC, TR010065/APP/6.5), exemptions to core working hours have been stated to reduce the risk of rail accidents, adhering to best practice measures stated under Section 61 of the Control of Pollution Act 1974.</p>	
25	Aircraft disasters	A worst case scenario involves an aircraft collision occurring and loss of aircraft control resulting in death of those involved in the disaster.	Yes	<ul style="list-style-type: none"> • Properties: Chapter 5 (Air Quality) of the ES (TR010065/APP/6.1) and Chapter 11 (Noise and Vibration) of the ES (TR010065/APP/6.1). • People, drivers and workers: Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1). 	<p>The Kelham and Averham Flood Compensation Areas are directly adjacent to an airstrip for light aircraft.</p> <p>To mitigate this, the drainage design has been considered during the Scheme development. Planting has been designed to detract birds using the land as a nesting area, minimising the risk of airstrikes.</p> <p>The nearest international airport (East Midlands Airport – approximately 43 kilometers (27 miles) southwest) and domestic airport (Foston – approximately 13 kilometers (8 miles) south) - are at distance from the Scheme so medium and heavy aircraft accidents are unlikely.</p>	No
27	Bridge failure	Potential risk to life.	Yes	<ul style="list-style-type: none"> • Aquatic environment and ecological receptors: Chapter 8 (Biodiversity) of the ES (TR010065/APP/6.1), and Appendices 8.1-8.14 of the ES Appendices, (TR010065/APP/6.3). • People, drivers and workers: Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1). 	<p>Bridge works to be undertaken as part of the Scheme have been designed to meet modern safety standards, reducing their likelihood of future failure.</p> <p>The risk associated with bridge failure is considered no greater than other roads that include structures designed to comparable standards.</p>	No

ID	Stage 1: Identification		Stage 2: Screening		Stage 3: Further screening	Stage 4: Assessment
	Event	Reasonable worst consequences if event did occur	Relevant to Scheme?	Relevant receptors	Mitigation and/or management action	Requires assessment?
28	Property or bridge demolition accidents	Potential risk to life.	Yes	<ul style="list-style-type: none"> Terrestrial environment and ecological receptors: Chapter 8 (Biodiversity) of the ES (TR010065/APP/6.1) and Appendix 8.3 of the ES Appendices (TR010065/APP/6.3). People, drivers and workers: Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1). 	<p>Two existing structures have been identified as requiring demolition.</p> <p>As outlined in the First Iteration EMP (REAC Commitment: M3, Table 3-2 Table 3-2 REAC, TR010065/APP/6.5), waste arisings from demolition works will be managed as high up the waste hierarchy as possible, reducing the generation of waste.</p> <p>Additionally, a bat mitigation licence will be prepared and require agreement with Natural England, prior to the development consent application, due to the unavoidable demolition of one bat roost (building F004) which has potential to kill, injure, and disturb bats (First Iteration EMP, REAC Commitment: B2, Table 3-2 REAC, TR010065/APP/6.5).</p> <p>To mitigate harm against people, drivers and workers, the on-time of or acoustically treat the excavator with breaker attachment and the hydro demolition equipment (the main contributors of noise during this activity) during enabling works. Therefore, noise monitoring will be undertaken by the PC Environmental Manager for the enabling works activities as set out in the First Iteration EMP (REAC Commitment: NV3, Table 3-2 REAC, TR010065/APP/6.5).</p> <p>Accordingly, there is no requirement to consider and evaluate this event further.</p>	No
29	Tunnel failure/fire Dam failure Mast and tower collapse	Potential risk to life.	No – no tunnel, dam or mast and tower structures are proposed and no structure currently exists as part of the Scheme.	N/A	N/A	N/A
31	Flood defence failure	Potential risk to life.	Yes	<ul style="list-style-type: none"> People, drivers and workers: Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1). Water resources and properties: Chapter 13 (Road Drainage and Water Environment) of the ES (TR010065/APP/6.1). 	<p>The Scheme directly ties into existing flood defences.</p> <p>Whilst the Scheme does connect directly to existing flood defence assets, their risk of failure will not be affected by the Scheme and assets they were defending will not be at a greater risk of flooding than in existing conditions. Therefore, further mitigation is not required.</p> <p>The Scheme design has been developed with mitigation measures for increased flood risk that include allowances for future climate change. The potential risk of breach events has been considered in Chapter 13 (Road Drainage and the Water Environment) of the ES (TR010065/APP/6.1) and Appendix 13.2 (Flood Risk Assessment) of the ES Appendices (TR010065/APP/6.3).</p>	Yes

ID	Stage 1: Identification		Stage 2: Screening		Stage 3: Further screening	Stage 4: Assessment
	Event	Reasonable worst consequences if event did occur	Relevant to Scheme?	Relevant receptors	Mitigation and/or management action	Requires assessment?
33	Building failure or fire	An event occurs resulting in death.	Yes	<ul style="list-style-type: none"> • People, drivers and workers: Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1). • Properties: Chapter 5 (Air Quality) of the ES, (TR010065/APP/6.1). 	<p>Buildings in the Scheme's vicinity comprises low-rise residential and commercial properties as well as industrial buildings including the Staythorpe Power Station and the British Sugar Factory.</p> <p>Building failure or fire occurring during the Scheme's construction would be considered by the Principal Contractor within their own detailed methodology and risk assessments.</p> <p>As outlined in the First Iteration EMP (REAC Commitment: GS7, Table 3-2 REAC, TR010065/APP/6.5), best practice construction techniques would be used by the Principal Contractor during the Scheme's construction, reducing the risk of building failures and fires. For example, works which neighbour premises that contain potentially flammable substances and materials (for example, the Esso petrol stations) are subject to the measures set out in The Control of Major Accident Hazards Regulations 2015¹⁴.</p> <p>Operationally, building failure or fire risks in the Scheme's vicinity are not considered to be any greater than those associated with existing land uses surrounding the existing A46.</p>	No
34	Utilities failure	An event occurs resulting in death.	Yes	<ul style="list-style-type: none"> • People, drivers and workers: Chapter 12 (Population and Human Health) of the ES, (TR010065/APP/6.1). 	<p>Underground and above-ground utilities coincide with the Scheme. The local operator, company or statutory undertaker are responsible for infrastructure failure and repair.</p> <p>There is also potential for protection slabs over the 11kv feeds that cross under the A46 and railway adjacent to the Sewage Treatment Works (STW).</p> <p>Utility diversions have been considered in the design of the Scheme (see Chapter 2 (The Scheme) of the ES (TR010065/APP/6.1)) and have therefore been assessed as part of the ES.</p> <p>Construction-related incidents related to the works are covered by existing legislation and by any relevant protective provisions secured in Schedule 9 of the draft DCO (TR010065/APP/3.1).</p> <p>The National Emergency Plan: Downstream Gas and Electricity¹⁵ sets out the response for arrangements that would be implemented in the event of a gas or electricity supply emergency relating to a failure of utilities infrastructure.</p>	No

¹⁴ Health and Safety Executive (2015) The Construction (Design and Management) Regulations 2015 [online] available at: [Construction - Construction Design and Management Regulations 2015 \(hse.gov.uk\)](https://www.hse.gov.uk/construction-design-management-regulations-2015/) (last accessed December 2023).

¹⁵ GOV.UK. (2023). National Emergency Plan for downstream gas and electricity. [online] available at: <https://assets.publishing.service.gov.uk/media/64c3c9cbf92186000d866760/national-emergency-plan-downstream-gas-and-electricity.pdf> (last accessed December 2023).

ID	Stage 1: Identification		Stage 2: Screening		Stage 3: Further screening	Stage 4: Assessment
	Event	Reasonable worst consequences if event did occur	Relevant to Scheme?	Relevant receptors	Mitigation and/or management action	Requires assessment?
35	Defence industry and Unexploded Ordnance (UXO) risk	An event occurs resulting in death.	No – UXO assessment using Zetica UXO website (2023) risk mapping, identified as low risk.	N/A	N/A	N/A
36	Energy industry (fossil fuel)	An event occurs resulting in death.	No – all such active plants or facilities are located a considerable distance from the Scheme.	N/A	N/A	N/A
37	Nuclear power					
38	Oil and gas refinery / storage Food industry, including the British Sugar Factory Chemical industry Manufacturing industry					
42	Mining industry	An event occurs resulting in death.	Yes	<ul style="list-style-type: none"> Geological receptors: Chapter 9 (Geology and Soils) of the ES (TR010065/APP/6.1). People, drivers and workers: Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1). 	<p>The Coal Authority Interactive Map viewer indicates that the study area for the Scheme is not located within a Coal Mining Reporting Area, including no coal mining features or license areas. Quarrying operations for sand and gravel are recorded within the Order Limits (noted as borrow pits) for construction of the nearby Great North Road. The existing A46 (and the Scheme) cross some of the borrow pits used for the Great North Road, at Kelham roundabout.</p> <p>Ground investigations undertaken as part of the design-development and EIA processes have considered historic mining activity on land associated with the Scheme. Further information is outlined in the Ground Investigation Report (TR010065/APP/7.10).</p>	No
43	Bomb / vehicle attack on people or infrastructure Mass shooting Chemical / gas attack Rioting	An attack occurs resulting in death.	No – the Scheme is unlikely to be a target for this type of event due to the low number of exposed targets.	N/A	N/A	N/A
47	Cyber-attack	An attack occurs resulting in a security breach.	Yes	<ul style="list-style-type: none"> People, drivers and workers: Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1). 	<p>Relying on roadside technology could make the Scheme more vulnerable to a cyber-attack.</p> <p>National Highways is accountable to the Secretary of State for Transport for the strategic road network's vulnerability to national security risks, including cyber-attacks.</p>	No

ID	Stage 1: Identification		Stage 2: Screening		Stage 3: Further screening	Stage 4: Assessment
	Event	Reasonable worst consequences if event did occur	Relevant to Scheme?	Relevant receptors	Mitigation and/or management action	Requires assessment?
					National Highways' Digital, Data and Technology Strategy ¹⁶ outlines the key principles that underpin the operation, maintenance and modernisation of the organisation's information and technology assets. National Highways is required to comply with Government policies and principles covering the areas of UK Cyber Security and Security of Services. Accordingly, Scheme roadside technology are compliant with relevant policies covering cyber security, which would minimise the risk of future attacks.	
48	Pandemic	A event occurs resulting in death.	Yes	<ul style="list-style-type: none"> People, drivers and workers: Chapter 12 (Population and Human Health) of the ES (TR010065/APP/6.1). 	<p>Due to the global Coronavirus pandemic in 2020 and 2021, there is a risk that similar influenza-style pandemics could occur in the future.</p> <p>UK Government lockdown procedures could be implemented, limiting movement to control and reduce the spread of viral infection. Such restrictions would accordingly reduce the number and frequency of car journeys made.</p> <p>National Highways' key workers and its appointed network maintenance contractors would undertake essential highway repair and/or maintenance works, ensuring the safe operation of the scheme for those needing to make essential journeys during lockdown periods.</p>	No
49	Spread of human, animal and plant diseases	An event occurs resulting in death.	Yes	<ul style="list-style-type: none"> Aquatic environment and ecological receptors: Chapter 8 (Biodiversity) of the ES (TR010065/APP/6.1) and the Appendices 8.1-8.14 of the ES Appendices (TR010065/APP/6.3). People, drivers and workers: Chapter 12 (Population and Human Health) of the ES, (TR010065/APP/6.1). 	<p>The spread of disease as a consequence of the Scheme is not considered to be any greater than other highway schemes.</p> <p>Best practice control measures would be implemented by the Principal Contractor during construction to handle and dispose of any diseased plants and/or injurious weeds, and to prevent their spread. Mitigation measures are described within the First Iteration EMP (REAC Commitment: B10, Table 3-2 REAC (TR010065/APP/6.5)).</p>	No

¹⁶ National Highways (2023) Digital, Data and Technology Strategy 2023 – 2025 [online] available at: [final-ddat-strategy-002.pdf \(nationalhighways.co.uk\)](https://www.nationalhighways.co.uk/consultations/2023-02-28-digital-data-and-technology-strategy-2023-2025) (last accessed December 2023)

1.6 Summary and conclusions

- 1.6.1 The assessment has concluded that the identified risks would not result in major accidents, during either construction or operation of the Scheme, with risk mitigation measures in place. Additionally, the risks associated with natural disasters would be sufficiently managed.
- 1.6.2 Consequently, there would be no additional environmental effects caused by major accidents or natural disasters with mitigation in place, and the Scheme would not increase the chances of these events occurring.

1.7 References

¹ HMSO (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [online] available at: [The Infrastructure Planning \(Environmental Impact Assessment\) Regulations 2017 \(legislation.gov.uk\)](https://www.legislation.gov.uk/uksi/2017/1000/contents/made) (last accessed December 2023).

² Official Journal of the European Union (2011). Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) [online] available at: [EUR-Lex - 32011L0092 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/eli/dir/2011/92/oj) (last accessed December 2023).

³ Official Journal of European Union (2011). Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment [online] available at: [EUR-Lex - 32014L0052 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/eli/dir/2014/52/oj) (last accessed December 2023).

⁴ Department for Transport (2014). National Policy Statement for National Networks [online] available at: [National policy statement for national networks - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/281242/national-policy-statement-for-national-networks-2014.pdf) (last accessed December 2023)

⁵ Department for Levelling Up, Housing & Communities (December 2023). National Planning Policy Framework [online] available at: [National Planning Policy Framework \(publishing.service.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/112149/nppf-2023.pdf) (last accessed March 2024).

⁶ The Stationery Office (2015). The Control of Major Accident Hazards Regulations 2015 [online] available at: [The Control of Major Accident Hazards Regulations 2015 \(legislation.gov.uk\)](https://www.legislation.gov.uk/uksi/2015/1000/contents/made) (last accessed December 2023).

⁷ HMSO (1992). The Workplace (Health, Safety and Welfare) Regulations 1992 [online] available at: [The Workplace \(Health, Safety and Welfare\) Regulations 1992 \(legislation.gov.uk\)](https://www.legislation.gov.uk/uksi/1992/1000/contents/made) (last accessed December 2023).

⁸ HSMO (1996). The Pipelines Safety Regulations 1996 [online] available at: [The Pipelines Safety Regulations 1996 \(legislation.gov.uk\)](https://www.legislation.gov.uk/uksi/1996/1000/contents/made) (last accessed December 2023).

⁹ HSMO (1996). Gas Safety (Management) Regulations 1996 [online] available at: [Gas Safety \(Management\) Regulations 1996 \(legislation.gov.uk\)](https://www.legislation.gov.uk/uksi/1996/1061/contents/made) (last accessed December 2023).

¹⁰ Health and Safety Executive (2015) The Construction (Design and Management) Regulations 2015 [online] available at: [Construction - Construction Design and Management Regulations 2015 \(hse.gov.uk\)](https://www.hse.gov.uk/l24/) (last accessed December 2023).

¹¹ Cabinet Office (2017). National Risk Register of Civil Engineers, 201 Edition [online] available at: [\[Withdrawn\] National Risk Register of Civil Emergencies – 2017 Edition - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/629453/Withdrawn-National-Risk-Register-of-Civil-Emergencies-2017-Edition-GOV.UK-2017-06-20.pdf) (last accessed December 2023).

¹² Nottingham and Nottinghamshire Local Resilience Forum (2018). Nottingham and Nottinghamshire Local Resilience Forum Community Risk Register [online] available at: [Community Risk Register \(nottinghamcity.gov.uk\)](https://www.nottinghamcity.gov.uk/~/media/2018-04-18-Community-Risk-Register-2018-2020.pdf) (last accessed December 2023).

¹³ The Planning Inspectorate (2017). Advice Note Eleven: Annex G – The Health and Safety Executive [online] available at: [Letter \(planninginspectorate.gov.uk\)](https://www.planninginspectorate.gov.uk/media/1234567/annex-g-hse.pdf) (last accessed December 2023).

¹⁴ Health and Safety Executive (2015) The Construction (Design and Management) Regulations 2015 [online] available at: [Construction - Construction Design and Management Regulations 2015 \(hse.gov.uk\)](https://www.hse.gov.uk/l24/) (last accessed December 2023).

¹⁵ GOV.UK. (2023). National Emergency Plan for downstream gas and electricity. [online] available at: <https://assets.publishing.service.gov.uk/media/64c3c9cbf92186000d866760/national-emergency-plan-downstream-gas-and-electricity.pdf> (last accessed December 2023).

¹⁶ National Highways (2023) Digital, Data and Technology Strategy 2023 – 2025 [online] available at: [final-ddat-strategy-002.pdf \(nationalhighways.co.uk\)](https://www.nationalhighways.co.uk/media/64c3c9cbf92186000d866760/final-ddat-strategy-002.pdf) (last accessed December 2023)