



West Winch Housing Access Road

Environmental Statement Chapter 1: Appendix 1: EIA Scoping Report Annex G

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1 Introduction

1.1.1 The below table provides supporting information with regards to the main text of Appendix 1.1 (EIA Scoping Report). The table contains information relating to the screening and scoping of major events, including accidents and disasters, relevant to the scheme.

Table 1 – Screening and scoping major events relevant to the scheme

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In/Out	Scoped In?
Natural Hazards	Geophysical	Earthquakes	Do not occur in Britain of a sufficient intensity owing to the motion of the Earth's tectonic plates causing regional compression. In addition, uplift from the melting of the ice sheets that covered many parts of Britain thousands of years ago can also cause movement. The BGS acknowledges that on average, a magnitude 4 earthquake happens in Britain roughly every two years and a magnitude 5 earthquake occurs around every 10 to 20 years. As such the Cabinet Office National Risk Register of Civil Emergencies states that "Earthquakes in the UK are moderately frequent but rarely result in large amounts of damage. An earthquake of sufficient intensity (determined on the basis of the earthquake's local effect on people and the environment) to inflict severe damage is unlikely". The scheme not in or close to an active area	No
Natural Hazards	Geophysical	Volcanic Activity	The scheme is not in an active area and highly unlikely that an ash cloud could significantly impact on any aspect of the scheme	No
Natural Hazards	Geophysical	Landslides	The topography of the area is generally flat and level, no significant slopes have been noted. The topography at the site suggests the road would be largely at grade with an embankment used to rise the road level at the Hardwick Interchange. In designing the scheme to applicable standards, resources and receptors would not be put at a greater risk as a consequence of the scheme.	No
Natural Hazards	Geophysical	Sinkholes	This is likely to be covered in the geotechnical design, and there are no examples of roads that have been affected by sinkholes in the locality to warrant taking this event forward.	No
Natural Hazards	Geophysical	Tsunamis	The scheme is located inland, outside a tsunamis risk zone.	No
Natural Hazards	Hydrology	Coastal Flooding	The scheme is located inland, outside a coastal area.	No

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In/Out	Scoped In?
Natural Hazards	Hydrology	Fluvial Flooding	<p>The Environment Agency (EA) Flood Map for Planning (Rivers and Sea) indicates that the scheme alignment is located in the low-risk Flood Zone 1 where the risk of flooding from fluvial sources is less than 1 in 1,000 (0.1%) in any year. The very northern section of the A47 (adjacent to Hardwick Interchange) is partially located within Flood Zone 2. The EA's Long-Term Flood Risk map does not identify any fluvial flood risk areas within the scheme's boundary. There is a small area (approximately 0.004 Ha) to the east of the Constitution Hill Roundabout which encroaches into Flood Zone 2 (0.1-1% AEP). In the current draft of the Flood Risk Assessment (FRA) it is initially proposed to mitigate this through the provision of compensatory storage on a level for level basis to the North of the A47.</p> <p>The King's Lynn and West Norfolk Level 1 Strategic FRA (November 2018) states that the predominant source of flooding is from tidal sources, although recent flooding has been largely from surface water. Fluvial flooding is one of the primary sources of flood risk within the King's Lynn and West Norfolk locality. The most significant watercourse in terms of fluvial risk is the River Great Ouse; however, there are several other watercourses that pose a significant risk including the River Nar.</p> <p>High levels of precipitation (i.e. in winter) can not only result in the flooding of the road infrastructure but can also damage bridge infrastructure (through increased scour and erosion of embankments). The design of the new over bridge on Rectory Lane to cross over the proposed WWHAR and the new foot/cycle bridge over Chequers Lane will have consideration to this.</p>	No
Natural Hazards	Hydrology	Pluvial Flooding	<p>The King's Lynn and West Norfolk Level 1 Strategic FRA (November 2018) indicates that at the nearest settlement (Watlington) to West Winch, surface water flood risk consists predominantly of water ponding on roads, gardens and other open spaces. A total of 47 flood incidents along the A47 highway have been recorded since July 2008, by Highways England. UKCP18 suggests that climate change is projected to lead to wetter winters and drier summers, with more extreme rainfall events. The UKCP18 projections for changes in extreme precipitation in winter in the 25km grid square containing the scheme under high emissions scenarios estimate that by the 2020s, precipitation on the wettest day in winter is expected to increase by approximately 3%, by 2050s by 7% and by 2080s by 17% (50th percentile).</p> <p>The increase in impermeable surfaces as a result of the scheme, along with the likely increase in rainfall as a result of climate change over the lifetime of the scheme, would increase flood risk if not mitigated. In addition there is a potential pollution threat to nearby water courses which is no greater than that associated with the existing highway. The impact of future climate projections will be considered within the scheme design.</p>	No
Natural Hazards	Hydrology	Groundwater Flooding	<p>Groundwater levels are likely to be shallow at approximately 1.0mbgl – 11.0mbgl, depending on the location along the scheme.</p> <p>The Kings Lynn and West Norfolk Level 1 Strategic Flood Risk Assessment (November 2018) groundwater flood mapping shows that the scheme is susceptible to groundwater flooding. The southern extent (Setch Road at A10 to North Runcton) is susceptible to >25%<50% groundwater flood risk. The northern extent (from North Runcton to A47) is susceptible to <25% groundwater flood risk.</p> <p>The risk will be similar to that of the existing roads in the locality but should remain on the project / CDM risk register to ensure that it is addressed within the design of the road.</p>	No

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In/Out	Scoped In?
Natural Hazards	Hydrology	Avalanches	Not considered relevant given the geographical location of the scheme. The scheme's topography is generally flat and level, and therefore an avalanche will not occur.	No
Natural Hazards	Climatological and Metrological	Cyclones, hurricanes, typhoons, storms and gales	Cyclones, hurricanes and typhoons do not occur in the UK. The winter of 2015/2016 was the second wettest winter on record and a series of storms (including 'Desmond' and 'Eva') resulted in heavy and sustained rainfall. 17,600 UK properties were flooded and several bridges collapsed, disrupting access to and from local communities. Storms and gales could result in damage to highway infrastructure and could affect journeys made by road users; however, the risk is no different to similar roads or road users in the locality	No
Natural Hazards	Climatological and Metrological	Thunderstorms	This type of event could result in lightning strikes to temporary elevated structures during construction (e.g. tower cranes) and new elevated structures (such as bridges) introduced as part of the scheme; however, the risk is no different to similar roads or road users in the locality. Specific measures are therefore not considered to be required as part of the scheme.	No
Natural Hazards	Climatological and Metrological	Wave surges	The scheme is located sufficiently inland, and therefore is not subject to wave surges.	No
Natural Hazards	Climatological and Metrological	Extreme temperatures: Heatwaves Low (sub-zero) temperatures and heavy snow	This type of event could give rise to changes in climatic conditions, with road infrastructure exposed to greater heat intensity and exposure to sunlight. Heavy snow could cause workers and road users to be trapped on the highway. In August 1990, the UK experienced heatwave conditions with temperatures reaching what was then a record 37.1°C in Cheltenham, England. In August 2003 a UK heatwave lasted 10 days and resulted in over 2,000 deaths. Temperatures reached what was then a record 38.5°C in Faversham, England and 33°C in Anglesey, Wales. High temperature records are now being broken with increasing frequency. The most widespread and prolonged low temperatures and heavy snow in recent years occurred from December 2009 to January 2010. Daytime temperatures were mostly sub-zero across the UK. At night, temperatures in England regularly fell to -5°C to -10°C. Snowfall across the UK lasted for some time, allowing 20cm to 30cm of snow to build up, closing schools and making it very difficult to travel. Between 1981 and 2010, there were 20 occurrences where summer mean temperatures exceeded 25.1°C on five or more consecutive days. Between 1981 and 2010, there have been 1,357 days with a maximum minimum temperature below zero degrees Celsius. Between 1981 and 2010, there were 202 days with snow lying at 0900 however, there are no records from the Met Office of the depth of snow. However, the risk is no different to similar roads or road users in the locality. Specific measures are therefore not considered to be required as part of the scheme.	No

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In/Out	Scoped In?
Natural Hazards	Climatological and Metrological	Droughts	<p>Over the past 40 years England has experienced five long-duration droughts and two shorter periods of drought. During the 2010-12 drought, parts of eastern England recorded their lowest 18 month rainfall total in over 100 years.</p> <p>The Anglian Water Drought Plan 2019 states that The East of England is the driest region in the UK, with low rainfall (71 per cent of the UK average) and high evaporation losses. The region is designated by the EA as an area of serious water stress, and opportunities for new water resources are limited. The scheme is located in a Water Resource Zone which is vulnerable to severe drought. Potable water for the area of the scheme is supplied from a combination of groundwater and surface water sources.</p> <p>The Head and Lowestoft Formation of the superficial drift are designated as a Secondary Undifferentiated Aquifer and the Tottenham Gravel Member and Raised Beach Deposits are designated as a Secondary A Aquifer.</p> <p>The bedrock geology's of Mintlyn Member, Leziat Member and Roxham and Runcton Members are designated as a Principal Aquifer, that may support water supply and/or river base flow on a strategic scale. It is important that these water resources are protected.</p> <p>Prolonged periods of drought can also impact road infrastructure as drying out and cracking of soils may affect structural stability and prolonged dry periods can lead to cracking of surfaces and more rapid deterioration of materials. Decreased rainfall combined with an increase in the average temperature can also increase subsidence, affecting the stability of the road infrastructure, including pavements and hard surfaces.</p> <p>The scheme should not be vulnerable to drought as water is not an essential service during the construction, use or maintenance phases. The design of the sub-structure and bridges will be resilient to ground shrinkage and should remain in the design risk register until designed out.</p>	No
Natural Hazards	Climatological and Metrological	Severe Space Weather: Solar Flares	<p>Solar flare events are known to interrupt radio and other electronic communications. Records from solar storms in 1921 and 1960 describe widespread radio disruption and impacts on railway signalling and switching systems. There is no increased reliance on roadside technology therefore the scheme is no more vulnerable than local routes in existence.</p>	No
Natural Hazards	Climatological and Metrological	Severe Space Weather: Solar Energetic Particles	<p>Solar energetic particles which cause solar radiation storms, but only in outer space, so this major event type can be scoped out.</p>	No
Natural Hazards	Climatological and Metrological	Severe Space Weather: Coronal Mass Ejections	<p>Coronal mass ejections (CME) cause geomagnetic storms. The geomagnetic storm in 2003 caused the UK aviation sector to lose some GPS functions for a day, however no known significant impact on road users or infrastructure was recorded.</p>	No
Natural Hazards	Climatological and Metrological	Fog	<p>Fog is one of the most common weather conditions in the UK, particularly throughout autumn and winter. Severe disruption to transport occurs when the visibility falls below 50m over a wide area. However, the risk for the scheme should be no higher than the current local road network. Collision data over the period 2015-2020 shows there to be no accidents where fog was a contributory factor.</p>	No

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In/Out	Scoped In?
Natural Hazards	Climatological and Metrological	Wildfires: Forest fire, Bush/brush, pasture	<p>In April and May 2011 numerous wildfires broke out across the UK after unusually hot and dry weather. England received only 21% of its usual rainfall for April 2011. Parts of the scheme would be located in, and be surrounded by, areas of woodland that could be at risk of wildfire events during hot, dry periods and/or fires initiated by construction related activities.</p> <p>During construction, standard control measures would be implemented by the appointed contractor to manage the risk of fire. During operation, the risk is no different to similar roads or road users in the locality. Specific measures are therefore not considered to be required as part of the scheme.</p>	No
Natural Hazards	Climatological and Metrological	Poor Air Quality	<p>In 2006 the UK experienced two periods of extended hot weather with associated elevated ozone and harmful airborne particles. In the spring of 2015, two particle pollution episodes caused widespread poor air quality throughout the UK, with multiple areas measuring 'High' on the Daily Air Quality Index and resulted in around 1,100 deaths due to exacerbation of pre-existing ill-health conditions. Summer 2015 also contained two elevated ozone episodes.</p> <p>Construction: Construction effects would be temporary for the duration of the construction phase. Increased dust emissions from construction activities and combustion related emissions from on-site plant and vehicles could affect local air quality at nearby sensitive receptors (residential receptors). Traffic management measures during construction may also lead to changes in vehicles emissions which may, in turn, result in impacts on local air quality. Providing mitigation measures are in place during the construction phase, the changes in local air quality are not expected to be significant.</p> <p>Operation: The scheme is expected to result in changes to emissions of NO_x, NO₂, PM₁₀ and PM_{2.5} along the A47 and A10 and linked routes as a result of changes in traffic flows and speeds. The scheme, leading to an overall redistribution of traffic along the A47 and A10 (south of West Winch), is also expected to reduce congestion and provide a more consistent traffic speed. Therefore, the scheme could result in both beneficial and adverse changes to local air quality, depending on the specific changes to emissions from road traffic in the vicinity of individual receptors. The changes are, however, unlikely to be significant.</p>	No
Natural Hazards	Biological	Disease epidemics:- Viral- Bacterial- Parasitic- Fungal- Prion	<p>The scheme is located in a developed country where the population is in general good health. Furthermore, the use of the scheme (highway) is not going to give rise to any disease epidemics. Public Health England, the executive agency of the Department of Health is responsible for protecting the nation from public health hazards, preparing for and responding to public health emergencies. One of Public Health England's functions is to protect the public from infectious disease outbreaks and the Agency has produced a document providing operational guidance for the management of outbreaks of communicable disease, 'Communicable Disease Outbreak management: Operational Guidance'.</p>	No
Natural Hazards	Biological	Animal Diseases: - zoonotic: • avian influenza • West Nile virus • Rabies - non-zoonotic: • foot and mouth • swine fever	<p>Low and highly pathogenic avian influenza has been recorded in poultry in the UK several times in the last 10 years, most recently in the winter of 2016/17, although with no human cases reported. There was a devastating foot and mouth outbreak in 2001.</p> <p>There are no known foot and mouth burial pits in the scheme boundary.</p> <p>The use of the scheme is not going to be the source of any disease epidemics and spread would be controlled through containment of infected animals including prohibition of transportation.</p>	No

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In/Out	Scoped In?
Natural Hazards	Biological	Plants	Should invasive plant species be identified during ongoing ecological survey works, standard control measures will be implemented by the appointed contractor during construction to handle and dispose of any diseased plants and/or injurious weeds, and prevent their spread.	No
Technological or Manmade Hazards	Societal	Extensive public demonstrations which could lead to violence and loss of life.	The scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts. The scheme is not considered highly controversial and should not lead to high profile public demonstrations.	No
Technological or Manmade Hazards	Societal	Widespread damage to societies and economies.	The scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	No
Technological or Manmade Hazards	Societal	The need for large-scale multi-faceted humanitarian assistance.	The scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	No
Technological or Manmade Hazards	Societal	The hindrance or prevention of humanitarian assistance by political and military constraints.	The scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	No
Technological or Manmade Hazards	Societal	Significant security risks for humanitarian relief workers in some areas.	The scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	No
Technological or Manmade Hazards	Societal	Famine	The scheme is located in a developed country that produces its own crops and imports food. It is politically stable and not subject to hyperinflation and therefore food is available, whether produced within the UK or imported. Famine is also not relevant to the use of the scheme (highway).	No
Technological or Manmade Hazards	Societal	Displaced population	There will be no significant displacement of populations as part of the scheme.	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Chemical sites	There are no Control of Major Accident Hazard (COMAH) sites within a 5km corridor along the scheme.	No

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In/Out	Scoped In?
Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Pipelines	<p>One low pressure and two high pressure National Grid gas pipelines run under sections of the scheme and through the scheme's boundary.</p> <p>The following pipelines have also been identified in correspondence from the HSE but are located away from the scheme such that further consideration is not necessary</p> <ul style="list-style-type: none"> - 4427809 National Grid Gas PLC, Palm Paper Ltd / NGrid Offtake Facility. This pipeline is approximately 2.8km west of the scheme's boundary. - 1032059 Perenco to Shell Blend Gas pipeline. This pipeline is approximately 74km from the scheme boundary. <p>The two high pressure gas pipelines are to be diverted (new sections of pipeline to be constructed) to meet current engineering and safety standards. There will be an increased risk of a major event during the construction phase due to the nature of the work required on the pipeline. However, any work within the consultation zone of the pipelines must be undertaken with the agreement of the pipeline operator, which will include risk assessment and method statements covering the works to be carried out before they can commence, under existing legal requirements, namely The Pipelines Safety Regulations 1996. Risks during maintenance and operation of the scheme should not be significantly different than baseline situation.</p>	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Nuclear	Nuclear sites are designed, built and operated so that the chance of accidental releases of radiological material in the UK is extremely low. Last historical major accident in the UK was Windscale in 1957. No nuclear sites are located within a 5km corridor along the scheme.	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Fuel storage	<p>In December 2005 Europe's largest peacetime fire occurred at the Buncefield Oil Storage Terminal in Hemel Hempstead, England. The surrounding area was temporarily evacuated and some local businesses experienced long-term disruption to operations.</p> <p>There are no fuel storage sites within the study area other than two petrol stations, one approximately 555m west of the scheme's boundary (Esso) and one approximately 310m north (Sainsburys) of the scheme.</p>	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Dam breaches	<p>Dam breaches in the UK are rare; the last major breach was at the Cwm Eigiau dam in 1925, which caused 17 fatalities and widespread flooding.</p> <p>Environment Agency Flood Risk from Reservoirs map indicates that there is no risk of flooding from reservoirs in the scheme's boundary.</p>	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Mines and storage caverns	Coal Authority records state that there are no areas of coal workings.	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Fires	<p>Fires could be initiated by construction related activities which impact areas adjacent to the construction activities. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of fire.</p> <p>There are two petrol stations, one approximately 555m west of the scheme's boundary (Esso) and one approximately 310m north (Sainsburys) of the scheme.</p> <p>Urban buildings in close proximity of the scheme are low-rise and predominantly residential, although taller commercial properties exist.</p> <p>Notwithstanding this, the risk of fires affecting the scheme during operation is no greater than risks for existing highways through/developments in an urban environment.</p>	No

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In/Out	Scoped In?
Technological or Manmade Hazards	Transport accidents	Road	<p>Significant transport accidents occur across the UK on a daily basis, mainly on roads, and involving private and/or commercial vehicles.</p> <p>During construction, there will be an increase in heavy construction plant and equipment on the local road network which may increase the risk of accidents.</p> <p>The scheme has been designed to achieve a reduction in existing accident rates on the road network, and to take account of any accidental spillages through modern drainage and treatment systems. The environmental risks posed by spillages of hazardous loads as a result of road accidents will be considered as part of the EIA.</p> <p>The indicative design includes speed limit reductions from 40mph to 30mph between WWHAR junction and Hardwick Interchange, in addition a short section of the A10 in the centre of West Winch to be reduced to 20mph to create a 'high street' environment.</p>	No
Technological or Manmade Hazards	Transport accidents	Rail	There are no railways within the vicinity of the scheme's boundary.	No
Technological or Manmade Hazards	Transport accidents	Waterways	There are none located in the study area used for significant transport by water. No historical evidence of waterway accidents impacting the road network.	No
Technological or Manmade Hazards	Transport accidents	Aviation	There have been no major air accidents in the UK since the Kegworth incident in 1989. There are no working airfields within the study area.	No
Technological or Manmade Hazards	Pollution incidents	Air	<p>Construction activities may cause dust emissions which may contribute to poor air quality albeit on a temporary basis. Use of fossil fuelled mobile plant and equipment during the construction phase. However, emissions from mobile plant and equipment covered under H&S and environmental legislation.</p> <p>Emissions associated with vehicles travelling on new and improved sections of highway proposed as part of the scheme may contribute to events associated with poor air quality.</p> <p>The potential for this event will be considered as part of the EIA process, and it is therefore not considered a requirement to evaluate this further.</p>	No
Technological or Manmade Hazards	Pollution incidents	Land	<p>During construction there may be an increase in the risk of leaks and spillages of hazardous materials associated with the construction activities. There is also the risk that any potential existing contamination may be disturbed.</p> <p>During construction, standard control measures would be implemented by the appointed contractor to manage the risk of spillages and leaks.</p> <p>The design of the scheme will take account of any accidental spillages e.g. via use of Sustainable Urban Drainage (SuDS) which will also provide water quality treatment for highway drainage. The environmental risks posed by spillages of hazardous loads as a result of road accidents will be considered during the EIA e.g. via the Highways England Water Risk Assessment Tool (HEWRAT) Assessment.</p>	No

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In/Out	Scoped In?
Technological or Manmade Hazards	Pollution incidents	Water	<p>Superficial deposits comprising Head Deposits, Lowestoft Formation and Tottenhill Gravel Member are low productivity aquifers of limited or local potential. The Environment Agency designates these units as Secondary A (Tottenhill Gravel Member) and Secondary Undifferentiated aquifers (Head Deposits and Lowestoft Formation). Secondary A aquifers are classified as permeable strata capable of supporting water supplies on a local rather than strategic scale.</p> <p>The bedrock geology comprises the Leziat Member, Mintlyn Member, Ructon and Roxham Members, which make up the Sandringham Sand Formation and underlies most of the scheme. The Kimmeridge Clay Formation is present to the south of the scheme only.</p> <p>The Sandringham Sand Formation comprises silty and clayey sands and is designated a Principal Aquifer, that may support water supply and/or river base flow on a strategic scale.</p> <p>The Kimmeridge Clay Formation consists of thin siltstone and cementstone beds, sands and silts and is designated Unproductive Strata with low permeability and negligible significance for water supply or river baseflow.</p> <p>The majority of the scheme falls within a Major Aquifer High and Major Aquifer Intermediate and indicates that if there is pollution event on the surface the area is susceptible to and able to transmit pollution to groundwater. The south of the scheme falls within a Minor Aquifer High groundwater vulnerability zone and indicates that if there is a pollution event on the surface the area will offer some groundwater protection.</p> <p>During construction there may increase the risk of leaks and spillages of hazardous materials associated with the construction activities. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of spillages and leaks.</p>	No
Technological or Manmade Hazards	Utilities failures	Electricity	<p>Instances of electricity failure (also referred to as power loss or blackout) can be caused by a number of things, such as severe weather (e.g. very strong winds, lightning and flooding) which damage the distribution network. These tend to be mainly localised and less frequently regional as a result of severe winter storms and consequent damage to the distribution overhead line network. Underground and above-ground electrical transmission lines are present across the scheme's boundary, the responsibilities of which lie with the relevant local operator or company should this infrastructure fail.</p>	No
Technological or Manmade Hazards	Utilities failures	Gas	<p>Underground gas transmission pipelines cross the scheme's boundary, the responsibilities of which lie with the relevant local operator or company should this infrastructure fail. The diversion works will be considered as part of the EIA.</p> <p>The potential risk of construction-related incidents when undertaking diversion works as part of the scheme would be covered by existing H & S legislation.</p> <p>No gas use is associated with the scheme.</p>	No
Technological or Manmade Hazards	Utilities failures	Water supply	<p>No water use associated with the scheme during its operation and relatively low use during construction which could be addressed by tankering in supplies if required.</p>	No
Technological or Manmade Hazards	Utilities failures	Sewage system	<p>No use of the sewage system is associated with the scheme. During the construction phase temporary portable systems will be in place covered by H&S welfare requirements.</p>	No
Technological or Manmade Hazards	Malicious Attacks	Unexploded Ordnance	<p>A low potential exists for encountering unexploded ordnance during construction of the scheme. Measures would be undertaken during construction to brief operatives to raise awareness of this issue, and to define appropriate response strategies such as this be discovered during the works. There would be a limited risk of unexploded ordnance affecting the scheme, once operational but no greater than similar schemes.</p>	No

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Technological or Manmade Hazards	Malicious Attacks	Attacks Chemical Biological Radiological Nuclear	Extremists remain interested in Chemical, Biological, Radiological and Nuclear (CBRN) materials, however alternative methods of attack such as employing firearms or conventional explosive devices remain far more likely. Historical use has been in closed densely occupied structures (underground, buildings) or targeted at specific individuals. The scheme is unlikely to be a target for this type of event due to the low number of exposed targets.	No
Technological or Manmade Hazards	Malicious Attacks	Transport systems	Potential systems would include (but are not limited to) railways, buses, passenger ferries, cargo vessels and aircraft. The scheme is unlikely to be a target for this type of event due to the low number of exposed targets.	No
Technological or Manmade Hazards	Malicious Attacks	Crowded places	The scheme does not fall within the definition of a crowded place, i.e. pedestrian routes and other thoroughfares as well as sports arenas, retail outlets and entertainment spaces. The scheme is unlikely to be a target for this type of event due to the low number of exposed targets.	No
Technological or Manmade Hazards	Malicious Attacks	Cyber	Cyber-attacks occur almost constantly on key national and commercial electronic information, control systems and digital industries. Technology is not proposed to be installed as part of the scheme (gantries and overhead signage). The scheme not considered to be more vulnerable to attack than similar road infrastructure installed and running elsewhere on the strategic and other road networks. Highways England is accountable to the Secretary of State for Transport for ensuring the resilience of their strategic road network to national security risks, including from terrorism, cyber-attack, natural hazards and other risks outlines in the National Risk Assessment.	No
Technological or Manmade Hazards	Malicious Attacks	Infrastructure	Terrorists in the UK have previously attacked, or planned to attack, national infrastructure. Attempts were made to attack electricity substations in the 1990s. Bishopsgate, in the City of London, was attacked in 1993 and South Quay in London's Docklands in 1996. These attacks resulted in significant damage and disruption but relatively few casualties. The scheme would have minimal impact on local infrastructure.	No
Technological or Manmade Hazards	Engineering accidents and failures	Bridge failure	Bridge works are proposed as part of the scheme. These structures have been designed to meet modern safety standards, which reduces their likelihood of future failure. The risk associated with the scheme of this event is considered no greater than other similar roads that include new structures designed to comparable standards.	No
Technological or Manmade Hazards	Engineering accidents and failures	Flood defence failure	The study area associated with the scheme does not benefit from flood defences or flood storage areas. The design of the scheme has been developed to include allowances for future climate change predictions that could result in flooding. The potential risk of breach events is considered in the EIA.	No
Technological or Manmade Hazards	Engineering accidents and failures	Mast and tower collapse	There are no towers or masts (other than telephone wire masts) in close proximity to the scheme or being built as part of the scheme.	No

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Technological or Manmade Hazards	Engineering accidents and failures	Property or bridge demolition accidents	The scheme involves demolition works to take down a very small number of buildings and structures. At present, the dualling of the A47 may require the demolition of two residential properties located on the northern side of the existing A47 alignment. The risks of accidents occurring during these works would be taken into account by the appointed contractor, and considered as part of their detailed methodology and risk assessments in advance of these works. Surveys would be undertaken prior to the demolition of properties and structures to confirm whether any potentially harmful substances (e.g. asbestos) are present, and to determine the risk to people	No
Technological or Manmade Hazards	Engineering accidents and failures	Tunnel failure/fire	There are no tunnel structures proposed as part of the scheme or within the study area other than the extension of an existing underpass at the northern end of the WWHAR.	No