

ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT

Appendix B – Major Accidents and Disasters Scoping Record

HyNet North West Carbon Dioxide Pipeline DCO

Planning Act 2008

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Major Event Group	Major Event Category	Major Event Type	Topic chapter(s) with relevant information	Relevant to Scheme Area?	Phases which exacerbate vulnerability	Potential Receptors	Basis of Decision to Scope In/Out	Scope In?
Natural Hazards	Geophysical	Earthquakes	Chapter 3: Description of the Proposed Development	N	N/A	N/A	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 Proposed Development is not in or close to an active area.	N
Natural Hazards	Geophysical	Volcanic Activity	Chapter 3: Description of the Proposed Development	N	N/A	N/A	The Proposed Development is not in an active area and it is highly unlikely that an ash cloud could significantly impact on any aspect of the Proposed Development.	N
Natural Hazards	Geophysical	Landslides	Chapter 10: Land and Soils	N	C,O	Workers Public and local community Property	The Proposed Development's topography is mostly relatively flat or gently undulating land. Historical landslides have not been recorded within the boundary of the Proposed Development and the Proposed Development does not involve the formation of deep cuts/high embankments. In designing the Proposed Development to applicable standards, resources and receptors would not be put at a greater risk as a consequence of the Proposed Development.	N
Natural Hazards	Geophysical	Sinkholes	Chapter 10: Land and Soils	N	C,O	Workers Public and local community Property	The superficial soils underlying the Proposed Development route include the following; Alluvium, Glacial Till (Diamicton), Peat, Glacial Sand and Gravel and Head Deposits. The bedrock geology that underlies the Proposed Development route includes various sandstone and shale formations, and coal measures rather than limestone. Therefore, the geology is unlikely to be prone to the natural formation of sinkholes There are no examples of sinkholes in the locality of the Proposed Development to warrant taking this event forward.	N
Natural Hazards	Geophysical	Tsunamis	Chapter 3: Description of the Proposed Development	N	N/A	N/A	The Proposed Development is not located in a tsunamis risk zone.	N
Natural Hazards	Hydrology	Coastal Flooding	Chapter 3: Description of the Proposed Development Chapter 16: Water Resources and Flood Risk	Y	C	People Property Workers	The floodplains of the Dee Estuary and River Gowy, as well as land east of Elton, are at risk of coastal/tidal flooding. The four Block Valve Stations are all located within areas of land with a 0.1% (or less) chance of flooding each year from rivers or the sea. Their locations are within Zone A which is considered to be at little or no risk of fluvial or tidal/coastal flooding.	Y

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Natural Hazards	Hydrology	Fluvial Flooding	Chapter 3: Description of the Proposed Development Chapter 16: Water Resources and Flood Risk	Y	C,O	Aquatic environment and ecological receptors Properties Road Users Public and local community	<p>The Proposed Development crosses Flood Zone 2 at five locations: the floodplains associated with Gale Brook, Thornton Brook East, River Gowy and tributaries, and the Dee Estuary. Flood Zone 2 is land assessed as having between 0.1% and 1 % chance of flooding any given year from rivers, or between 0.1% and 0.5% chance of flooding any given year from the sea.</p> <p>In Wales, the Proposed Development crosses Zone C2 (Areas of floodplain not benefitting from flood defences) in three locations: the Dee Estuary, Alltami Brook and Wepre Brook. There is land either side of the Dee Estuary which is located within Zone C1 (Areas of floodplain which are developed and benefitting from flood defences).</p> <p>The recorded flood outline shows that the following areas have previously flooded from fluvial or coastal sources:</p> <ul style="list-style-type: none"> • Rural land west of Thornton le Moors (April 1971); • Knolls Bridge, Chester (January 2964); • Part of Deeside Industrial Estate (Date not published); • Land south east of Garden City (Date not published); • Land between Sandycroft and A5104 Chester Road (Date not published); and • Land at Ewloe Green (Date not published). <p>In the location of the Proposed Development crossing of the Dee Estuary, the adjacent land is classed as an area benefitting from flood defences for flooding from the sea. These defences run along the edge of the Dee Estuary, Finchetts Drain, Border Drain and Sandycroft drain (upstream of Chester Road). There is also an area of Hawarden Airport which benefits from fluvial flood defences, likely associated with the Sandycroft Drain.</p> <p>There are also flood defences along the Mill Brook, River Gowy and its tributaries, and Gale Brook. These defences comprise of either high ground or embankments along the watercourses. As a result, the Essar Stanlow Refinery site is defined as an area benefitting from these defences.</p> <p>The four Block Valve Stations are all located within areas of land with a 0.1% (or less) chance of flooding each year from rivers or the sea. Their locations are within Zone A which is considered to be at little or no risk of fluvial or tidal/coastal flooding. The Block Valve Stations at Coed-y-Cra, Cornist Lane and Pentre Halkyn are located within areas of very low risk of fluvial flooding, however they are located within 500m of high risk areas. These areas are floodplains associated with the Afon Nant-y-Flint and Afon Pant-Gwyn.</p>	Y
Natural Hazards	Hydrology	Pluvial Flooding	Chapter 3: Description of the Proposed Development Chapter 16: Water Resources and Flood Risk	Y	C,O	Aquatic environment and ecological receptors Properties Road Users Public and local community	<p>The Preliminary Flood Risk Assessment for Cheshire West and Chester, published November 2011, stated local sources of flooding, excluding Main River, to be surface water runoff, ordinary watercourses, groundwater and canals.</p> <p>There are a few areas of surface water flooding, mostly associated with ordinary watercourses or overland flow routes. Notable locations include:</p> <ul style="list-style-type: none"> • Land east of Pool Lane, Stanlow Oil Refinery; • Land adjacent to Gale Brook; • Land adjacent to Thornton Brook East; • Land adjacent to the River Gowy and its tributaries; • Land adjacent to the Shropshire Union Canal, Wervin; • Chorlton Lane; • Collinge Wood; • South of Station Road, Lea by Backford; • Land adjacent to Grove Road, Lea by Backford; • Land east of Parkgate Road, Mollington; and • Land south west of Chester Road, Sandycroft. <p>The Block Valve Stations are located in areas which are at very low risk of surface water flooding (areas of land with 0.1% (of less) chance of flooding each year from surface water).</p>	Y

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Natural Hazards	Hydrology	Groundwater Flooding	Chapter 3: Description of the Proposed Development Chapter 16: Water Resources and Flood Risk	Y	C	Property Workers	The Cheshire Strategic Flood Assessment (Cheshire West and Chester Council, 2016) indicates that few areas within the Proposed Development are susceptible of groundwater flooding. These areas are mainly located within the eastern section of the Proposed Development (Grinsome Road AGI and Alcohols Site AGI) and in proximity of the River Dee.	Y
Natural Hazards	Hydrology	Avalanches	Chapter 3: Description of the Proposed Development	N	N/A	N/A	Not considered relevant given the geographical location of the Proposed Development. The Proposed Development's topography is relatively flat and therefore an avalanche will not occur.	N
Natural Hazards	Climatological and Meteorological	Cyclones, hurricanes, typhoons, storms and gales	Chapter 3: Description of the Proposed Development Chapter 7: Climate Canage	Y	C,O	Property Workers	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 the Above Ground Infrastructure (AGIs) and the Block Valve Station compounds. Their design takes into account environmental conditions including exposure to UK weather conditions. The risk is not significantly different to other similar infrastructure in the locality such as AGIs for the natural gas transmission system around North Cheshire and Wales.	N
Natural Hazards	Climatological and Meteorological	Thunderstorms	Chapter 3: Description of the Proposed Development Chapter 6: Climate	Y	C,O	Workers	This type of event could result in lightning strikes to temporary elevated structures during construction (e.g. tower cranes); however, the risk is no different to other construction projects in the locality. Specific measures are therefore not considered to be required as part of the Proposed Development.	N
Natural Hazards	Climatological and Meteorological	Wave surges	Chapter 3: Description of the Proposed Development Chapter 16: Water Resources and Flood Risk	Y	C,O	Property Workers	The Proposed Development is located in an area at risk of coastal/tidal flooding. The floodplains of the Dee Estuary and River Gowy, as well as land east of Elton, are at risk of coastal/tidal flooding. The pipeline is below ground and therefore would not be subject to the direct hydraulic forces of a wave surge. The Block Valve Stations are far enough inland not to be subject to wave surges.	N

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Natural Hazards	Climatological and Meteorological	Extreme temperatures: Heatwaves Low (sub-zero) temperatures and heavy snow	Chapter 6: Climate	Y	N/A	N/A	<p>This type of event could give rise to changes in climatic conditions, with infrastructure exposed to greater heat intensity and exposure to sunlight. Heavy snow could cause workers to be trapped on the construction sites.</p> <p>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.</p> <p>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.</p> <p>Between 1981 and 2010, there were 13 occurrences where summer mean temperatures exceeded 25.2°C on five or more consecutive days.</p> <p>Between 1981 and 2010, there have been 1,461 days with a maximum minimum temperature below zero degrees Celsius.</p> <p>Between 1981 and 2010, there were 235 days with snow lying at 0900 however, there are no records from the Met Office of the depth of snow.</p> <p>However, the risk is not significantly different to other similar infrastructure in the locality such as AGIs for the natural gas transmission system around North Cheshire and Wales. Specific measures are therefore not considered to be required as part of the Proposed Development.</p>	N
Natural Hazards	Climatological and Meteorological	Droughts	Chapter 3: Description of the Proposed Development Chapter 10: Land and Soils Chapter 6: Climate	Y	C,O	Aquatic environment and ecological receptors People Properties Workers Road users	<p>Over the past 40 years or so 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>Prolonged periods of drought can also impact 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.</p> <p>The Proposed Development should not be vulnerable to drought as water is not an essential service during the construction, use or maintenance phases. The design of the pipeline will be resilient to ground shrinkage and should remain in the design risk register until designed out.</p>	N
Natural Hazards	Climatological and Meteorological	Severe Space Weather: Solar Flares		N	N/A	N/A	<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.</p> <p>Telemetry to allow remote operation of valves and remote monitoring systems will be installed as part of the Proposed Development. However, the Proposed Development is no more vulnerable than other similar infrastructure in the locality such as AGIs for the natural gas transmission system around North Cheshire and Wales.</p>	N
Natural Hazards	Climatological and Meteorological	Severe Space Weather: Solar Energetic Particles		N	N/A	N/A	<p>Solar energetic particles which cause solar radiation storms, but only in outer space, so this major event type can be scoped out.</p>	N
Natural Hazards	Climatological and Meteorological	Severe Space Weather: Coronal Mass Ejections		N	N/A	N/A	<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 there was no known significant impact on infrastructure.</p>	N

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Natural Hazards	Climatological and Meteorological	Fog	Chapter 6: Climate	Y	N/A	N/A	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. It is only during the construction phase when fog may impact the Proposed Development, however in this event construction works would cease until weather conditions had improved.	N
Natural Hazards	Climatological and Meteorological	Wildfires: Forest fire, Bush/brush, pasture	Chapter 6: Climate	N	C,O	Aquatic environment and ecological receptors Properties Workers Road users	The Proposed Development is not located in, or 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.	N
Natural Hazards	Climatological and Meteorological	Poor Air Quality	Chapter 5: Air Quality Chapter 14: Population and Human Health	Y	C	Ecological receptors People Workers Road users	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. Construction: Construction effects would be temporary for the duration of the construction phase. These effects would relate to: • Increased dust deposition from construction activities and traffic could lead to potential loss of amenity and harm to ecological receptors; • Increased exposure to particulate matter (PM10 / PM2.5) in relation to human health; and • Increased exposure to emissions from vehicles (NO2 / PM10 / PM2.5) from construction plant and construction vehicle movements. Operation: No likely significant effects on local air quality have been identified for the operational phase. Following implementation of appropriate mitigation measures, no significant residual air quality effects are anticipated during construction and operation of the Proposed Development.	N
Natural Hazards	Biological	Disease epidemics: - Viral - Bacterial - Parasitic - Fungal - Prion	Chapter 3: Description of the Proposed Development	Y	C	Aquatic and ecological receptors People Workers Road Users	The Proposed Development is located in a developed country where the population is in general good health. Furthermore, the use of the Proposed Development is not going to give rise to any disease epidemics. Public Health England and Public Health Wales, the executive agencies of the Department of Health are responsible for protecting the nation from public health hazards, preparing for and responding to public health emergencies. One of Public Health England's and Wales' functions is to protect the public from infectious disease outbreaks and the Agencies have produced documents providing operational guidance for the management of outbreaks of communicable disease, 'Communicable Disease Outbreak management: Operational Guidance'.	N
Natural Hazards	Biological	Animal Diseases: - zoonotic: • avian influenza • West Nile virus • Rabies - non-zoonotic: • foot and mouth • swine fever	Chapter 10: Land and Soils	Y	C	Aquatic and ecological receptors People Workers Road Users	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. There are no known foot and mouth burial pits within the Scoping Boundary. Animal diseases has been Scoped Out as the use of the Proposed Development is not going to be the source of any disease epidemics.	N

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Natural Hazards	Biological	Plants	Chapter 8: Ecology and Biodiversity	N	C	Aquatic and ecological receptors People Workers	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.	N
Technological or Manmade Hazards	Societal	Extensive public demonstrations which could lead to violence and loss of life.	Chapter 3: Description of the Proposed Development	Y	C	Road users Public and local communities	The Proposed Development is located in a developed country that has steady, yet small population growth. England and Wales are politically stable with no direct border with countries experiencing conflicts. The Proposed Development is not considered highly controversial and should not lead to high profile public demonstrations.	N
Technological or Manmade Hazards	Societal	Widespread damage to societies and economies.	Chapter 3: Description of the Proposed Development	N	N/A	N/A	The Proposed Development is located in a developed country that has steady, yet small population growth. England and Wales are politically stable with no direct border with countries experiencing conflicts.	N
Technological or Manmade Hazards	Societal	The need for large-scale multi-faceted humanitarian assistance.	Chapter 3: Description of the Proposed Development	N	N/A	N/A	The Proposed Development is located in a developed country that has steady, yet small population growth. England and Wales are politically stable with no direct border with countries experiencing conflicts.	N
Technological or Manmade Hazards	Societal	The hindrance or prevention of humanitarian assistance by political and military constraints.	Chapter 3: Description of the Proposed Development	N	N/A	N/A	The Proposed Development is located in a developed country that has steady, yet small population growth. England and Wales are politically stable with no direct border with countries experiencing conflicts.	N
Technological or Manmade Hazards	Societal	Significant security risks for humanitarian relief workers in some areas.	Chapter 3: Description of the Proposed Development	N	N/A	N/A	The Proposed Development is located in a developed country that has steady, yet small population growth. England and Wales are politically stable with no direct border with countries experiencing conflicts.	N
Technological or Manmade Hazards	Societal	Famine	Chapter 3: Description of the Proposed Development	N	N/A	N/A	The Proposed Development 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 Proposed Development.	N
Technological or Manmade Hazards	Societal	Displaced population	Chapter 3: Description of the Proposed Development	N	N/A	Public and local communities	There will be no significant displacement of populations as part of the Proposed Development.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Chemical sites	N/A	Y	C,O	Public and local communities	There are at least 10 Control of Major Accident Hazard (COMAH) sites within a 5km corridor along the Proposed Development. Essar Oil Stanlow (Upper Tier), CF Fertilisers (Upper Tier), Innospec Ltd (Upper Tier), Encirc Limited (Lower Tier), Argent Energy Holdings Limited (Upper Tier), CLH Pipeline System (CLH-PS) Limited (Upper Tier), FMC Agor Limited (Upper Tier), Valspar (UK) Corp Ltd (Lower Tier), Great Bear Distribution Limited (Lower Tier).	Y

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Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Pipelines	N/A	Y	C	Road users Public and local communities	There are several Major Accident Hazard (MAH) pipelines whose consultation distances overlap with the study area associated with the Proposed Development.	Y
Technological or Manmade Hazards	Industrial and Urban Accidents	Nuclear	N/A	N	N/A	N/A	Nuclear sites are designed, built and operated so that the chance of accidental releases of radiological material in the UK is extremely low. The last historical major accident in the UK was Windscale in 1957. There are no nuclear sites within a 5km corridor along the Proposed Development.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Fuel storage	Chapter 3: Description of the Proposed Development	Y	O	Workers Road Users	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. There are fuel storage sites within the study area. Stanlow Terminals Limited (Lower Tier) within 100m. Hawarden Airport (also known as Chester Airport) is located approximately 530m south east of the Proposed Development north of Broughton. CLH Pipeline System (CLH-PS) Limited with fuel storage and distribution located near chainage 1-14 within 250m of the Proposed Development.	Y
Technological or Manmade Hazards	Industrial and Urban Accidents	Dam breaches	Chapter 16: Water Resources and Flood Risk	Y	C	Workers	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. The Environment Agency Flood Risk from Reservoirs map indicates that the pipeline crosses one area at risk of reservoir flooding. This is at the River Dee and its floodplain on the right bank within the existing flood zone C1 / Flood Zone 2. However, as the pipeline is located below ground it is unlikely to be affected by flooding as a result of a dam breach.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Mines and storage caverns	Chapter 10: Land and Soils	Y	C,O	Road users Workers	The section of the Proposed Development that lies within Wales is located within a Coal Mining Reporting Area due to the legacy mining of the region, and potential for the Proposed Development to be underlain by historical voids. The Coal Authority Interactive Map viewer indicates there are probably shallow workings below the Proposed Development route and former mine shafts within the near vicinity (including the buffer zone). Shallow coal mining related stability issues to be assessed and addressed in line with Coal Authority Guidance which will make the risk as low as reasonably practicable (ALARP). This risk should remain in the design risk register.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Fires	Chapter 3: Description of the Proposed Development	Y	C,O	Cultural heritage sites People Road users	Fires could be initiated by construction related activities which impact areas adjacent to the construction area. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of fire. There is a working airfield with fuel storage located at Broughton, 530m south-east of the Scoping Boundary. This is a sufficient distance from the Scoping Boundary that a fire would not have a significant impact on any part of the Proposed Development. Urban buildings in close proximity of the Scoping Boundary are low-rise and predominantly residential, although taller commercial properties exist. Notwithstanding this, the risk of fires affecting the pipeline associated with the Proposed Development during operation is no greater than risks to other existing below ground pipelines. However, consideration needs to be given to the AGI's within the consultation distances of the existing COMAH sites.	Y

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Technological or Manmade Hazards	Transport accidents	Road	Chapter 10: Land and Soils Chapter 16: Water Resources and Flood Risk	Y	C	Aquatic environment and ecological receptors Properties Workers Road users	<p>Significant transport accidents occur across the UK on a daily basis, mainly on roads, and involving private and/or commercial vehicles.</p> <p>The proposed CO2 pipeline would require a total of 37no. road crossings for the preferred route within the EIA scoping boundary. Of these, two would cross the motorway network and six would be 'A' Road Crossings. A further six locations would cross the 'B' road network with the remainder crossing classified unnumbered roads and unclassified roads.</p> <p>The Newbuild Infrastructure Scoping Boundary includes approximately 40no. potential road crossings. Of these, three would cross the trunk road network at the M56, M53 and A494. Further 'A' Road crossings would be required at, for example, the A41, A540, A548, and A550. 'B' road network crossings include the B5129, B5125, and B5126. The remainder of road crossings would take place at classified unnumbered roads and unclassified roads.</p> <p>During construction there will be an increase in heavy construction plant and equipment on the local road network which would form the entry and exit points for construction traffic and therefore may increase the risk of accidents. Careful consideration of the micro-siting of these temporary access points will be a key feature in terms of reducing the risk of adverse effects, with access points needing to incorporate appropriate visibility splays, turning radii and speed limit reductions where necessary/appropriate. Outside of those design measures, the main mitigation for traffic and transport effects will be described within the Register of Commitments that will be submitted with the Environmental Statement.</p> <p>The operation of the Proposed Development will not result in increased traffic flow or changes to traffic composition which could have an adverse impact on highway safety. It is considered that there will not be a significant risk to underground pipeline integrity as a result of a road traffic accident as the pipeline will be buried and constructed to good engineering practice. The AGIs and Block Valve Stations are located at least 100m away from trunk/'A' roads and are within a fenced compound and therefore are unlikely to be impacted during a road traffic accident.</p>	N
Technological or Manmade Hazards	Transport accidents	Rail	Chapter 3: Description of the Proposed Development	Y	C	Aquatic environment and ecological receptors Properties Workers Road users	<p>The proposed pipeline route alignment would require crossing of the rail network in England and Wales. These include the London to Holyhead, Hooton to Helsby, Wrexham to Bidston and Chester to Liverpool Merseyrail Wirral Line.</p> <p>Trenchless crossing techniques will be employed during the construction phase so as not to impact ongoing use of the railway. There will be close liaison and agreement with the railway operator before works commence near and under the railway.</p> <p>The pipeline is a sealed, below-ground feature and therefore where it passes underneath embankments there is potential impacts on rail lines from subsidence over time and potentially vibration from trains passing over at high speed on the pipeline which will need to be considered in the design.</p> <p>It is considered that there will not be a significant risk to underground pipeline integrity from an impact resulting from a rail accident as the pipeline will be buried and constructed to good engineering practice. The AGIs and Block Valve Stations are located within a fenced compound a significant distance away from the railway line and are unlikely to be impacted during a rail accident.</p>	N
Technological or Manmade Hazards	Transport accidents	Waterways	Chapter 3: Description of the Proposed Development Chapter 16: Water Resources and Flood Risk	Y	C	Waterway users	<p>The Scoping Boundary crosses the Shropshire Union Canal which has a moderate ecological status and is mainly used by pleasure craft.</p> <p>Trenchless crossing techniques will be employed during the construction phase so as not to impact ongoing use of the canal. There will be close liaison and agreement with the canal operator before works commence near and under the canal.</p> <p>The pipeline is a sealed, below-ground feature and therefore there are no potential impacts anticipated for surface water bodies from the pipeline during the operational phase.</p>	N

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Technological or Manmade Hazards	Transport accidents	Aviation	Chapter 3: Description of the Proposed Development	Y	C,O	People	There have been no major air accidents in the UK since the Kegworth incident in 1989. There is one working airfield within the study area. Hawarden Airport (also known as Chester Airport) is located approximately 530m south east of the Proposed Development, north of Broughton. During operation, the risks associated with the Proposed Development should be no greater than the current situation. As the pipeline is buried below ground in this area, it is protected from above ground aviation incidents and is unlikely to be the initiator of an aviation incident. There are no AGIs or Block Valve Stations in proximity to the airport.	N
Technological or Manmade Hazards	Pollution accidents	Air	Chapter 5: Air Quality	Y	C,O	People Environmental receptors	Construction: Construction activities may cause an increase in the exposure to dust, particulate matter and emissions from vehicles and construction plant. However, this will only be on a short-term basis and those emissions associated with construction plant and vehicles are managed under specific environmental, health and safety legislation. The potential for this event will be considered in detail as part of the Environmental Impact Assessment process, and it is therefore not considered a requirement to evaluate this further. Operation: If there was a significant loss of containment event involving an AGI and/or pipeline and/or Block Valve Station, it would result in a large-scale release of CO2 to the environment which could potentially cause a significant adverse impact on local air quality. As CO2 is not currently defined as a dangerous substance under the Control of Major Accident Hazards Regulations 1999 (COMAH) or as a dangerous fluid under the Pipelines Safety Regulations 1996, there is no requirement to produce a formal Safety Case Report. In addition, detailed standards and codes of practice written specifically for the design and operation of dense phase or supercritical CO2 plant and pipelines are currently being developed. Therefore, further consideration of this event will be undertaken as part of the Environmental Impact Assessment.	Y
Technological or Manmade Hazards	Pollution accidents	Land	Chapter 10: Land and Soils Chapter 16: Water Resources and Flood Risk	Y	C	Ecological receptors Local heritage Public and local community	During the construction phase there may be an increase in the risk of leaks and spillages of hazardous materials associated with the construction activities. However, standard control measures would be implemented by the appointed contractor to manage the risk of spillages and leaks.	N
Technological or Manmade Hazards	Pollution accidents	Water	Chapter 10: Land and Soils Chapter 16: Water Resources and Flood Risk	Y	C,O	Public and local community Water environment	The superficial underlying aquifers comprise Secondary A aquifers and Secondary Undifferentiated aquifers. The bedrock aquifers comprise Principal, Secondary A, Secondary B and Secondary Undifferentiated aquifers. Given the rural nature of parts of the Proposed Development area both the Principal and Secondary Aquifers support a significant number of private water supplies. It is important that these water resources are protected. A groundwater Source Protection Zone (SPZ) Total Catchment Zone 3 is located at approximately 750m from the pipeline route (chainage 1-30), east of Chester and south of the River Dee. Within the eastern section of the Scoping Boundary (England), there are several groundwater abstractions located within 1km, all of which are used for industrial and agricultural uses. No information is currently available on the presence of groundwater abstractions within the western section of the Scoping Boundary (Wales). A groundwater SPZ is located in the centre of the existing Flint to Point of Ayr pipeline route, related to an unknown water abstraction. The most eastern Block Valve Station (Cornist Lane) is approximately 1 km south west of the SPZ . During construction there may be an increased risk of leaks and spillages of hazardous materials associated with the construction activities. However, standard control measures would be implemented by the appointed contractor to manage the risk of spillages and leaks.	N

Major Event Group	Major Event Category	Major Event Type	Topic chapter(s) with relevant information	Relevant to Scheme Area?	Phases which exacerbate vulnerability	Potential Receptors	Basis of Decision to Scope In/Out	Scope In?
Technological or Manmade Hazards	Utilities failures	Electricity	Chapter 3: Description of the Proposed Development	Y	C	Public and local community Workers	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 specific place, local (e.g. metropolitan area) and less frequently regional (e.g. North East) as a result of severe winter storms and consequent damage to the distribution overhead line network. Detailed information on the utilities which are located in the Proposed Development order limits will not be available until the final route of the Proposed Development is defined.	Y
Technological or Manmade Hazards	Utilities failures	Gas	Chapter 3: Description of the Proposed Development	Y	C	Public and local community Workers	Detailed information on the utilities which are located in the Proposed Development order limits will not be available until the final route of the Proposed Development is defined.	Y
Technological or Manmade Hazards	Utilities failures	Water supply		N	N/A	N/A	No water use associated with the Proposed Development during its operation and relatively low use during construction which could be addressed by tankering in supplies if required.	N
Technological or Manmade Hazards	Utilities failures	Sewage system		N	N/A	N/A	No use of the sewage system associated with the Proposed Development. During the construction phase temporary portable systems will be in place covered by H&S welfare requirements.	N
Technological or Manmade Hazards	Malicious Attacks	Unexploded Ordnance	Chapter 3: Description of the Proposed Development Chapter 10: Land and Soils	Y	C	Property Public and local community Workers	A potential exists for encountering unexploded ordnance during construction of the Proposed Development as the Deeside area was bombed during World War Two. 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 Proposed Development, once operational but no greater than similar developments.	Y
Technological or Manmade Hazards	Malicious Attacks	Attacks Chemical Biological Radiological Nuclear	Chapter 3: Description of the Proposed Development	N	N/A	N/A	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 Proposed Development is unlikely to be a target for this type of event due to the low number of exposed targets.	N
Technological or Manmade Hazards	Malicious Attacks	Transport systems		N	N/A	N/A	Potential systems would include (but are not limited to) railways, buses, passenger ferries, cargo vessels and aircraft. The Proposed Development is unlikely to be a target for this type of event due to the low number of exposed targets.	N
Technological or Manmade Hazards	Malicious Attacks	Crowded places		N	N/A	N/A	The Proposed Development 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 Proposed Development is unlikely to be a target for this type of event due to the low number of exposed targets.	N
Technological or Manmade Hazards	Malicious Attacks	Cyber	Chapter 3: Description of the Proposed Development	Y	O	Workers People Road users	Cyber attacks occur almost constantly on key national and commercial electronic information, control systems and digital industries. The reliance on telemetry for remote monitoring and to allow the remote operation of valves could render the Proposed Development more vulnerable to a cyber-attack. Notwithstanding this, it is not considered to be more vulnerable to attack than similar infrastructure installed and running elsewhere in the UK.	N

Major Event Group	Major Event Category	Major Event Type	Topic chapter(s) with relevant information	Relevant to Scheme Area?	Phases which exacerbate vulnerability	Potential Receptors	Basis of Decision to Scope In/Out	Scope In?
Technological or Manmade Hazards	Malicious Attacks	Infrastructure	Chapter 3: Description of the Proposed Development	N	N/A	N/A	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. An attack on the Proposed Development would have minimal impact on local/regional/national infrastructure or be considered a high profile attack.	N
Technological or Manmade Hazards	Engineering accidents and failures	Bridge failure	Chapter 3: Description of the Proposed Development	N	N/A	N/A	Bridge works are not proposed as part of the Proposed Development.	N
Technological or Manmade Hazards	Engineering accidents and failures	Flood defence failure	Chapter 6: Climate Chapter 16: Water Resources and Flood Risk	Y	C,O	People Property Road users Workers	Land adjacent to the Dee Estuary within the Scoping Boundary is classed as an area benefitting from flood defences for flooding from the sea. These defences run along the edge of the Dee Estuary, Finchetts Drain, Border Drain and Sandycroft drain (upstream of Chester Road). There is also an area of Hawarden Airport which benefits from fluvial flood defences, likely associated with the Sandycroft Drain. There are also flood defences along the Mill Brook, River Gowy and its tributaries, and Elton Green Brook. These defences comprise of either high ground or embankments along the watercourses. As a result, the Essar Stanlow Refinery site is defined as an area benefitting from these defences. The design of the Proposed Development will be developed to include allowances for future climate change predictions that could result in flooding. The potential risk of breach events is considered in the Environmental Impact Assessment. It is considered that the Alcohols Site and Grimsome Road AGIs which benefit from the flood defences are at no greater risk than other similar existing major hazard installations infrastructure protected by the flood defences and therefore the risks are considered to be as low as reasonably practicable (ALARP).	N
Technological or Manmade Hazards	Engineering accidents and failures	Mast and tower collapse		N	N/A	N/A	There are no towers or masts in close proximity to the Proposed Development or being built as part of the Proposed Development.	N
Technological or Manmade Hazards	Engineering accidents and failures	Property or bridge demolition accidents	Chapter 3: Description of the Proposed Development	Y	C	People Road users Workers	The Proposed Development does not involve demolition works.	N
Technological or Manmade Hazards	Engineering accidents and failures	Tunnel failure/fire	Chapter 3: Description of the Proposed Development	N	N/A	N/A	There are no tunnel structures proposed as part of the Proposed Development or within the study area.	N