

CONSULTATION REPORT

Appendix J Preliminary Environmental Information Report Non-technical Summary

HyNet Carbon Dioxide Pipeline DCO

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 –
Regulations 5(2)(q)

Document Reference Number D.5.1.10

Applicant: Liverpool Bay CCS Limited

Inspectorate Reference: EN070007

English Version

REVISION: A

DATE: September 2022

DOCUMENT OWNER: WSP UK Limited


PUBLIC

QUALITY CONTROL

Issue/Revision	First Issue	Revision 1	Revision 2	Revision 3
Document Reference	D.5.1.10			
Revision	A			
Author Name and Sign	IR			
Approver Name and Sign	BR			
Document Owner	WSP			

Appendix J

Preliminary Environmental Information Report



HyNet
North West

Document Number: D.5.1.10



PRELIMINARY ENVIRONMENTAL INFORMATION REPORT VOLUME I: NON-TECHNICAL SUMMARY

HyNet Carbon Dioxide Pipeline DCO

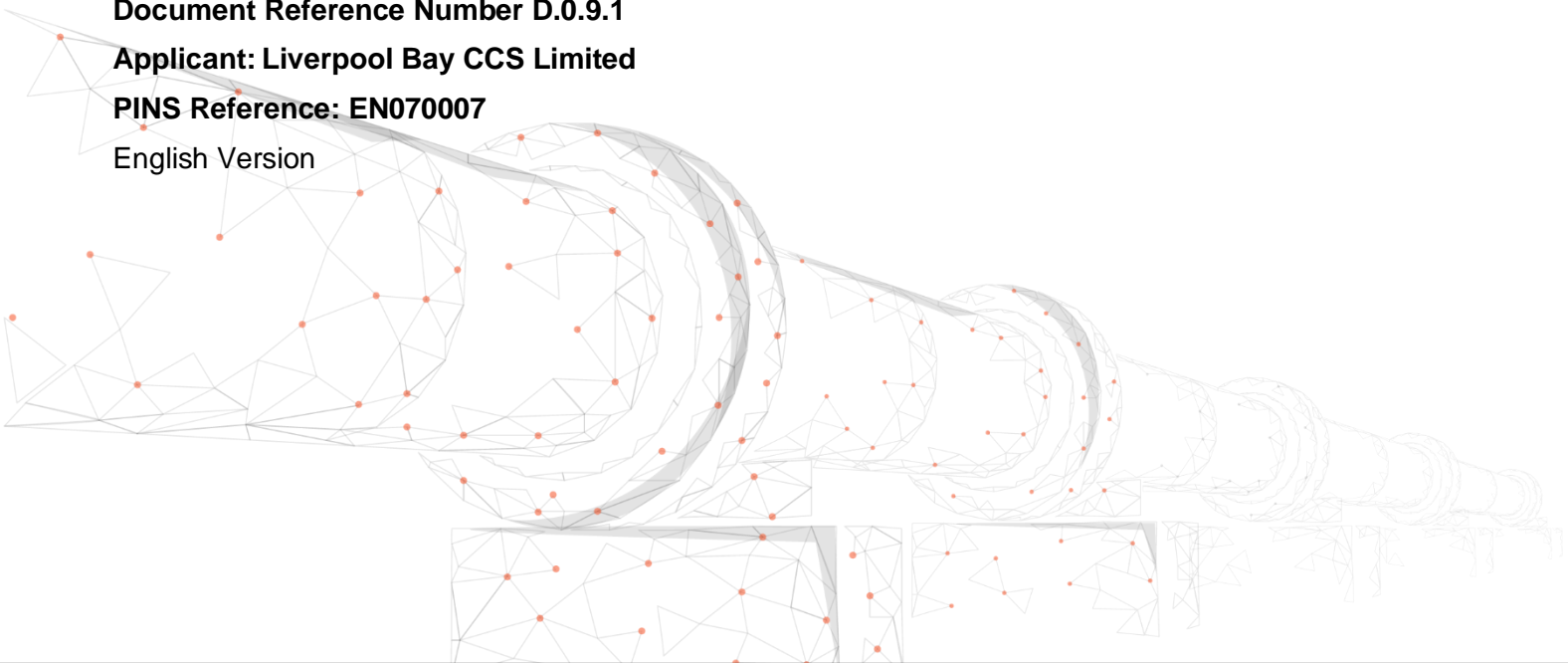
Planning Act 2008

Document Reference Number D.0.9.1

Applicant: Liverpool Bay CCS Limited

PINS Reference: EN070007

English Version



REVISION: 01

DATE: February 2022

DOCUMENT OWNER: WSP

PUBLIC

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1. INTRODUCTION

1.1. OVERVIEW

- 1.1.1. Liverpool Bay CCS Limited (the ‘Applicant’) intends to build a new underground Carbon Dioxide Pipeline from Cheshire, England to Flintshire, Wales and associated above ground installations (the ‘DCO Proposed Development’). The DCO Proposed Development will form part of the HyNet North West Project (‘the Project’) which is a hydrogen supply and Carbon Capture and Storage (CCS) project.
- 1.1.2. The DCO Proposed Development is classified as a Nationally Significant Infrastructure Project (NSIP) and will require a Development Consent Order (DCO) under the Planning Act 2008.
- 1.1.3. In advance of submitting the DCO Application, the Applicant is holding a consultation to get your views on the DCO Proposed Development in its current form. The consultation runs from 09 February to 22 March 2022.
- 1.1.4. As part of this consultation, the Applicant has prepared a Preliminary Environmental Information Report (PEIR) which sets out the preliminary findings of the Environmental Impact Assessment (EIA) process. This will enable the community and other stakeholders to develop an informed view of any likely significant environmental effects resulting from the DCO Proposed Development.

1.2. PURPOSE OF THIS NON-TECHNICAL SUMMARY (NTS)

- 1.2.1. This Non-Technical Summary (NTS) presents a summary of the information gathered and environmental assessment undertaken to date, as set out in the more technically detailed Preliminary Environmental Information Report (PEIR) (**Volumes II – IV**).
- 1.2.2. **Table 1.1** provides a summary of each section to help you navigate the NTS.

Table 1-1: Sections of the NTS

Section No.	Section Title	What is included
1	Introduction	Provides an overview of this PEIR Non-Technical Summary. It also gives an overview of the consenting process.
2	The Project	This section looks at the wider HyNet North West Project, and outlines the need for hydrogen power generation and Carbon Capture and Storage.
3	The DCO Proposed Development	This section describes the DCO Proposed Development and what is to be built, including details of how it will be built.
4	Alternatives Considered	This section provides a summary of the history of the design and how it has evolved.
5	Approach to EIA	This section explains how the preliminary environmental assessment has been undertaken and how it has been informed by consultation and stakeholder engagement.
6	Summary of Preliminary Information	For each of the environmental topics considered as part of the EIA, this section provides an overview of what is being assessed and the results of the preliminary assessment.
7	Have your say	This section explains what happens next in the EIA process and how you can have your say on the proposals.

1.3. THE CONSENTING PROCESS

- 1.3.1. Because of the nature and scale of the DCO Proposed Development, it is considered to be an “EIA Development” and an EIA must therefore be undertaken in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, (the ‘EIA Regulations’). An EIA is the process of identifying all of the environmental impacts of a development, to determine how significant these effects might be and how they could be avoided, minimised, or mitigated.
- 1.3.2. A Scoping Opinion was obtained in July 2021 from the Planning Inspectorate (PINS) on behalf of the Secretary of State (SoS) for Business, Energy, and Industry Strategy (BEIS). This determined the environmental topics to be addressed in detail within the EIA.
- 1.3.3. Public and stakeholder feedback is an essential component of the EIA process. The PEIR has been developed for this consultation to present the preliminary findings, including baseline data and an evaluation of potential impacts of the DCO Proposed Development.
- 1.3.4. Following feedback received from this consultation and ongoing assessment work, the EIA will be completed, and an Environmental Statement will be produced to report on the assessment outcomes and any proposed mitigation. The Environmental Statement will be submitted to the Planning Inspectorate as part of the DCO Application.
- 1.3.5. The DCO application will be examined by an Inspector or a panel of Inspectors, known as the Examining Authority. They will make a recommendation as to whether or not development consent should be granted. It is then the role of the SoS for BEIS to make the final decision on whether to grant or refuse development consent for the DCO Proposed Development.
- 1.3.6. We intend to submit a DCO application in Summer 2022.

OUR DCO APPLICATION WILL PASS THROUGH SIX STAGES:

1 PRE-APPLICATION STAGE

Statutory consultation and an EIA to be carried out before submitting an application (planned for Summer 2022). This is the stage we are in now.

2 ACCEPTANCE (SUMMER/AUTUMN 2022)

The DCO application is submitted and the Planning Inspectorate has 28 days to decide whether it meets the standards required to be accepted for pre-examination.

3 PRE-EXAMINATION (AUTUMN/WINTER 2022)

During this phase, any member of the public can register to become an interested party to give their views on the DCO application before and during the examination. An Examining Authority will be appointed. The Examining Authority will hold a preliminary meeting and set the timetable for examination.

4 EXAMINATION (EXPECTED WINTER – SUMMER 2023)

The Examining Authority will conduct their six-month examination on behalf of the Secretary of State. Interested parties can provide further views at this stage in writing, and request to speak at a public hearing.

5 RECOMMENDATION (EXPECTED AUTUMN 2023)

The Examining Authority provides a report and recommendation to the Secretary of State.

6 DECISION (EXPECTED WINTER 2023)

The Secretary of State makes a decision on the DCO application.

2. THE PROJECT

- 2.1.1. The DCO Proposed Development will form part of HyNet North West ('the Project') which is a hydrogen supply and Carbon Capture and Storage (CCS) project.
- 2.1.2. The aim of the Project is to reduce carbon dioxide (CO₂) emissions from industry, homes and transport and support economic growth in the North West of England and North Wales.
- 2.1.3. The Project is based on the production of low carbon hydrogen from natural gas, and includes the development of new hydrogen production plants, distribution pipelines, and the creation of CCS infrastructure. CCS prevents CO₂ entering the atmosphere by capturing it, compressing it, and transporting it for safe, permanent storage. A schematic representation of the Project is shown below.



2.1.4.

Delivery of the Project would be implemented in phases. The key components of the Project are briefly described as follows:

- **Hydrogen Production Plants:** The development and deployment of hydrogen production and supply facilities across the North-West region.
- **Hydrogen Network:** The development and deployment of hydrogen distribution infrastructure, in the form of underground pipelines, to transport hydrogen from the hydrogen production plants to the point of use across the North West region and North Wales.
- **Hydrogen Storage:** The development and deployment of hydrogen storage facilities, in the form of bulk underground storage in caverns to accommodate diurnal and seasonal demand fluctuations for heat and flexible power generation.
- **Carbon Capture:** The development and deployment of CCS infrastructure to capture, transport and store carbon dioxide from a range of existing and new-build industrial sources and from the hydrogen production plants.
- **Compressor Plants:** The existing gas treatment plant at Point of Ayr would be modified to function as part of the CO₂ transport and storage system. This includes the addition of an onshore compressor plant to compress the CO₂ to sufficient pressure to allow transport to the offshore storage facility.
- **Newbuild and repurposed onshore/offshore pipelines to transport CO₂:** A proposed network of underground onshore and buried subsea pipelines would transport CO₂ produced and captured by future hydrogen producing facilities and existing industrial premises in North West England and North Wales for permanent offshore storage.
- **Offshore Carbon Dioxide Storage:** Captured CO₂ would be stored permanently in depleted gas fields in an area located within the Liverpool Bay area of the East Irish Sea.

HyNet's CCS infrastructure will:



Capture CO₂ from industrial sources, including industry and hydrogen production processes.



Transport CO₂ via underground pipelines to a secure storage site.



Permanently store captured carbon dioxide deep beneath the seabed.

You can find out more about how the CO₂ pipeline and the technology works by watching the short animation on www.hynethub.co.uk.

3. THE DCO PROPOSED DEVELOPMENT

3.1. INTRODUCTION

3.1.1. The DCO Proposed Development comprises the construction, operation, and decommissioning of new underground CO₂ pipelines and associated above ground infrastructure.

3.2. KEY ELEMENTS OF THE DCO PROPOSED DEVELOPMENT

NEWBUILD ONSHORE PIPELINES TO TRANSPORT CO₂

3.2.1. There are three sections of newbuild onshore pipeline which form part of the DCO Proposed Development:

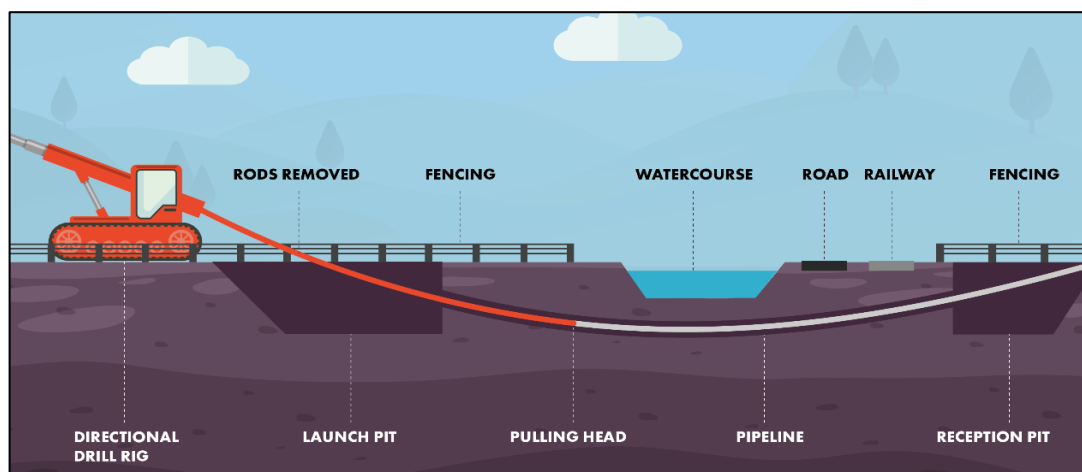
- Ince AGI to Stanlow AGI Pipeline.
- Stanlow AGI to Flint AGI Pipeline.
- Flint AGI to Flint Connection Pipeline.

3.2.2. The newbuild pipeline will connect into the existing Flint Connection to PoA Terminal Pipeline which is being repurposed to carry CO₂ rather than natural gas. Please refer to the diagram below.



	Existing Flint Connection - PoA Pipeline (24") (part of the Existing Connah's Quay - PoA Pipeline)
	The part of the Existing Connah's Quay - PoA Pipeline which is to be decommissioned
	Proposed Flint AGI - Flint Connection Pipeline (24")
	Proposed Stanlow - Flint AGI Pipeline (36")
	Proposed Ince - Stanlow Pipeline (up to 20")

- 3.2.3. The pipelines will be buried underground along their entire length. The minimum depth from the top of the pipe to the ground surface is typically 1.2m but deeper when the pipeline needs to avoid existing services and physical obstructions (for example, rivers, roads, and railway infrastructure).
- 3.2.4. Open-cut trenching methods would be used for constructing a majority of the pipeline routing. For crossings of railway lines, specified roads, main rivers, and other major infrastructure, specialist trenchless techniques would be used. The diagram below represents a technique known as Horizontal Directional Drilling which will be used at appropriate locations along the route of the pipeline.



THE PREFERRED PIPELINE ROUTE

- 3.2.5. To aid the design of the DCO Proposed Development and understand the potential environmental impact in greater detail, the DCO Proposed Development reported in the PEIR has been separated into seven sections (Sections 1 – 7). Please refer to **Figure 3.1 (Volume IV)** of the PEIR for further information.
- 3.2.6. The Applicant is continually working to refine the preferred route of each section of newbuild pipeline by liaising with local stakeholders, including individuals, communities, landowners and occupiers and local authorities to understand the impact of the DCO Proposed Development, as well as working with engineering and environmental experts.
- 3.2.7. The preferred route of the newbuild pipeline is presented on **Figure 3.2 (Volume IV)** of the PEIR along with an indication of any key environmental considerations which have been identified. A number of sub-options have been included along the preferred route. These are located where it has been identified that there is more than one alignment under consideration. The Applicant will complete further environmental and engineering assessments of these sub-options and they provide a basis for communication with landowners to understand how best to pass through that area of land.

ABOVE GROUND INFRASTRUCTURE

3.2.8. In addition to the newbuild pipeline, the DCO Proposed Development will include some above ground infrastructure. This will include:

- **Above Ground Installations (AGI):** Securely fenced compounds which provide the transition between the CO₂ pipeline system and the industrial emitters. The AGIs will house facilities for inspecting the pipeline (called Pipeline Inspection Gauges), electrical and instrumentation kiosks, lighting, parking provisions, and other associated infrastructure. The compounds would also include security lighting. There are four AGIs in total, located at; Ince, Stanlow, Northop Hall, and Flint.
- **Block Valve Stations (BVS):** Block valves are used to isolate sections of pipeline for maintenance purposes or in case of emergency. The block valves will be installed below ground level, with only limited above ground visible elements, including secure chamber access covers and a containerised electrical and instrumentation kiosk. The compounds would also include security lighting. There are seven BVSs in total, three located along the Stanlow AGI to Flint AGI Pipeline and four located along the existing Flint Connection to PoA Terminal Pipeline.
- **Cathodic Protection Transformer Rectifier Cabinets:** 'Cathodic protection cabinets' will be needed along the length of the pipeline, approximately 1km apart. Although small in scale, the CP cabinets are integral to the protection systems installed along the pipeline to avoid corrosion.
- **Marker Posts:** Marker posts are required at all roads, rail, river, canal crossings, changes in pipeline direction, and boundaries to raise awareness about the location of the pipeline to other stakeholders using the land. They also provide an important role when the pipeline is being inspected during operation.

3.3. CONSTRUCTION

OVERVIEW

3.3.1. Construction is anticipated to commence in 2024 and is expected to last approximately 16 months.

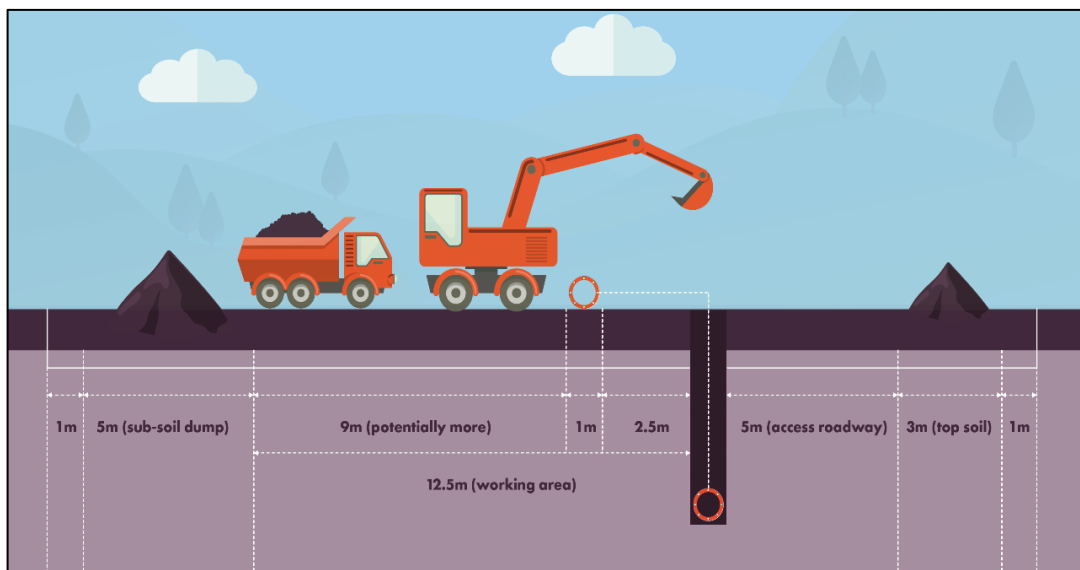
3.3.2. To ensure that the construction programme is minimised, the construction process would be programmed as a series of concurrent work packages along the length of each pipeline, where practicable.

3.3.3. A working day of 10 hours per day and 5 days per week is being proposed by the Applicant, however, trenchless techniques are proposed in a number of locations. The duration of such techniques will vary according to the length of the pipe being installed and the technique used.

- 3.3.4. Temporary Construction Compounds would be established before commencement of the main construction works. The fenced compounds would be accessed from the existing road network and would include single-storey staff welfare facilities, parking, waste storage, and wheel washing areas.
- 3.3.5. It is anticipated that construction works would be facilitated from a series of Centralised Compounds and Localised Compounds. The indicative location of each Construction Compound is shown on **Figure 3.3 (Volume IV)**.

PIPELINE CONSTRUCTION

- 3.3.6. The pipeline would be constructed in the same way as a natural gas transmission pipeline which typically involves excavation of an open trench, lowering of the pipe into the trench, and backfilling with the excavated material.
- 3.3.7. Construction works will generally be contained within a fenced working area, termed the working width. The working width is a fenced area within which all construction works would take place which is approximately 32m wide. A narrower working width may be required at specific locations to mitigate ecological impacts or to avoid sensitive structures, such as high voltage electricity transmission towers.



- 3.3.8. The sequence of activities for pipeline construction in rural areas will typically comprise:
- Pre-construction activities (for example, the formation of compound and material stores).
 - Clearing and fencing of the pipeline working width.
 - Removal of topsoil, which is stored separately to subsoil.
 - Receiving materials.

- Laying out ('stringing') of pipe sections adjacent to the trench line followed by welding and inspections of the pipe sections.
- Excavation of a narrow trench, to provide a depth of cover, typically 1.2m, but deeper at crossings.
- Lifting and lowering of the pipe into the trench and backfilling of the trench.
- Replacement of topsoil and reinstatement of existing drainage features.
- Removal of temporary fencing, planting of hedges and installation of new fencing.

3.3.9. The construction of the pipeline in built up urban areas would follow a similar sequence to that for rural areas, although as a result of the increased number of constraints, the construction process would be more complex. For example, there may be a greater requirement for the implementation of road closures, diversions, and traffic management measures.

ABOVE GROUND INFRASTRUCTURE CONSTRUCTION

3.3.10. The above ground infrastructure (for example, AGIs and BVS) would also be constructed using typical sequencing, as follows:

- Pre-construction activities (for example, the formation of compound and material stores).
- Construction of an access road if required, or upgrade of an existing track if possible.
- Erection of secure fencing for construction works.
- Connections to utility services.
- Earthworks to establish foundation levels.
- Formation of plant foundation bases and above ground structures.
- Construction of pipework and equipment and associated infrastructure.
- Perimeter reinstatement landscape works and removal of temporary infrastructure.

FIBRE OPTIC CABLE

3.3.11. A new FOC will be installed along the entire length of the Ince AGI to Stanlow AGI Pipeline and Stanlow AGI to Flint AGI Pipeline, connecting into communications equipment installed at each AGI and BVS.

3.3.12. The FOC will be installed within the same trench as the pipeline for open-cut trench sections and would be installed during the backfilling stage.

3.4. OPERATION AND MAINTENANCE

- 3.4.1. The new pipeline will be designed in accordance with relevant industry codes of practice, standards and recommended practice and the requirements of the Pipeline Safety Regulations 1996. The pipeline and above ground features will be designed to operate for the full life of the project, 25 years, without major replacement.
- 3.4.2. Once built, the pipeline would be protected by an easement. The width of the lease / easement would vary depending on the location. This would prevent construction or earthworks within the easement and allow access to the pipeline for routine and emergency maintenance.
- 3.4.3. The DCO Proposed Development would be monitored continuously from an existing central control room at the PoA terminal and would operate without the need for any permanent on-site staff. Emergency shut down valves would be located at the AGIs, with an Emergency Response Plan and Major Accident Prevention Document implemented.
- 3.4.4. A programme of inspection would be required in order to maintain and inspect the newbuild pipeline. This includes surveys, security and maintenance visits, pipeline testing, and condition assessments. Regular maintenance will include planned venting of CO₂ from the AGIs.

3.5. DECOMMISSIONING

- 3.5.1. When it reaches the end of its useful life, the pipeline would be safely decommissioned. It is anticipated that the pipeline would be made safe and left in situ. The AGIs and BVS are anticipated to be dismantled, including the decontamination and removal of any hazardous materials, and the land restored to former use.

4. CONSIDERATION OF ALTERNATIVES

- 4.1.1. A number of alternatives have been looked at in terms of: (i) alternative pipeline routes (ii) alternative locations of above ground infrastructure and (iii) alternative construction methods. The design and siting of the DCO Proposed Development will continue to evolve following Statutory Consultation and the final design will be reported in the ES submitted as part of the DCO Application.
- 4.1.2. The Applicant is continually working to refine the design of the DCO Proposed Development, including the route of the newbuild pipeline by liaising with local stakeholders, including individuals, communities, landowners and occupiers and local authorities to understand the impact of the DCO Proposed Development, as well as working with engineering and environmental experts. In addition, the details of the environmental mitigation to be provided are currently being developed as part of the environmental assessments. Any proposed mitigation will be set out in the DCO Application and accompanying ES.
- 4.1.3. As part of the review of alternatives a comparison is also made against doing nothing, to look at the overall benefits of the DCO Proposed Development. **Table 4-1** provides a summary of the findings.

Table 4-1: Alternatives Considered

Scenario	Description	Findings
Do nothing	Carbon emissions from industrial sources in the North West region would remain unabated.	This scenario is contrary to UK's goal to achieve net zero carbon emissions by 2050.
Alternative pipeline route corridors and route options	Consideration of alternative routes within four wider corridors. Within these corridors, a total of nine pipeline routes were identified for the Stanlow AGI to Flint AGI Pipeline, and an additional four routes for the Ince AGI to Stanlow AGI pipeline.	Alternative routes were discounted following an appraisal of each route against a number of environmental, social, engineering, and economic criteria, and following non-statutory consultation with interested parties.

Scenario	Description	Findings
Alternative above ground installation (AGI) sites	Consideration of different locations for the AGI sites.	The location of each AGI is largely dictated by its ability to maximise opportunities for connecting into CO ₂ capture plants. The size of each AGI will be driven by the infrastructure requirements (for example, number of pipeline connections) and the avoidance of existing utilities and land use and environmental constraints.
Alternative block valve station (BVS) sites	Consideration of different locations for the BVS.	The number of and location of BVSs is a function of the volume of CO ₂ that could be released, its rate of release, and the way in which it disperses. The preliminary location and number of BVS has been dictated by environmental, land use and engineering constraints, as part of the design development process.
Construction alternatives	Different construction compound, working area, and access locations were considered.	The location and size of construction compounds are a function of a number of things, including environmental and land use constraints, proximity to the pipeline / built element, the equipment and facilities required, and access.
	Different construction methodology was considered, including types of crossing methodology.	The best practicable construction techniques will be further refined during the assessment process, and in response to environmental risks which are identified.

5. ENVIRONMENTAL ASSESSMENT METHODOLOGY

- 5.1.1. Environmental assessment is an iterative process, which extends from project inception through to the final design and considers a development's impact during its construction, operational and decommissioning phases.
- 5.1.2. The full findings of the EIA will be presented in an Environmental Statement (ES) and submitted as part of the application for development consent. The ES provides the public and relevant organisations (such as the Environment Agency, and Natural Resources Wales) with the environmental information needed to understand and comment on a development and provides decision-makers with the environmental information to allow a decision to be made on whether to grant consent for the development.
- 5.1.3. The environmental assessment considers all relevant topics or 'aspects' that may be impacted such as ecology, archaeology etc. These aspects were agreed with the Planning Inspectorate and other stakeholders through the Scoping Process.
- 5.1.4. The method for assessing the significance of effects will vary between topics but will consider how something might change from the baseline conditions as a result of the DCO Proposed Development. This will include consideration of how sensitive that environmental component is to change, but also the duration of the effect and whether it is reversible.

LIKELY SIGNIFICANT ENVIRONMENTAL EFFECTS

- 5.1.5. When assessing environmental effects, we consider how significant that change might be. The significance of effect is described as either negligible, minor, moderate, or major. Effects classed as moderate, or major are considered 'significant'. The assessment also considers whether those effects are direct or indirect; short, medium, or long-term; permanent or temporary; and positive or negative effects.
- 5.1.6. Following identification of the likely significant effects, mitigation measures are developed to avoid, minimise, or remedy negative environmental impacts. We then consider the potential effects following the application of those mitigation measures. These are referred to as 'residual effects'. As part of this preliminary assessment, the likely significant effects from the DCO Proposed Development have been summarised in each topic section of this NTS.

6. SUMMARY OF PRELIMINARY ENVIRONMENTAL EFFECTS

6.1. AIR QUALITY

APPROACH TO THE ASSESSMENT OF AIR QUALITY

- 6.1.1. Air quality is the term used to describe how polluted the air we breathe is. Within the atmosphere, there are various airborne pollutants that can be detrimental to human health as well as the health of flora and fauna. These airborne pollutants can include dust, particulate matter, odours, and other airborne pollutants including hydrogen sulphide (H₂S).
- 6.1.2. The potential for the construction and operation of the DCO Proposed Development to cause changes to the air quality in the local area has been assessed. The levels of airborne pollutants in the local area have been identified and compared to predicted levels of airborne pollutants that may arise from the construction and operation of the DCO Proposed Development.
- 6.1.3. Particularly sensitive areas where the occupants are more susceptible to the adverse changes in air quality have been identified (sensitive receptors) and the change in air quality they are likely to experience has been predicted. Sensitive receptors within the study area include residential areas, schools, and ecological sites (that are designated for nature conservation).

PRELIMINARY ASSESSMENT

- 6.1.4. In general, given the predominantly rural nature of the study area, existing air quality is considered to be 'good', this means that the concentrations of airborne pollutants are well within the air quality objectives¹.
- 6.1.5. The preliminary assessment has identified that there will be no significant adverse effects during the construction and decommissioning phases of the DCO Proposed Development. Measures to control airborne pollutants will be implemented through good site practice and a Construction Environmental Management Plan.
- 6.1.6. The preliminary assessment has identified that there will be no significant adverse effects on air quality during the operation of the DCO Proposed Development. There will be a requirement to vent CO₂ at the AGIs during planned maintenance activities, however, the design of the venting equipment at the AGIs will ensure that any airborne pollutants released into the atmosphere are controlled.

¹ Air Quality Objectives are concentrations recorded over a given time period, which are considered to be acceptable in terms of what is scientifically known about the effects of each pollutant on health and on the environment.

6.2. CLIMATE RESILIENCE

APPROACH TO THE ASSESSMENT OF CLIMATE RESILIENCE

- 6.2.1. Climate Resilience is the ability to anticipate, prepare for, and respond to hazardous events, trends, or disturbances related to climate change.
- 6.2.2. The Climate Resilience assessment looks at the vulnerability of the construction and operation of the DCO Proposed Development to any future changes in climatic variables. These climatic variables include storms, droughts, extreme weather events, and sea level rise, among others. The assessment involved a review of the likely future changes to the climate variables where the DCO Proposed Development is located, and an assessment of the potential impacts these changes could have on each element of the DCO Proposed Development (including its construction).

PRIMARY ASSESSMENT

- 6.2.3. The region is among the more exposed parts of the UK, being relatively close to the Atlantic and containing large uplands, therefore the region experiences strong winds associated with the passage of deep areas of low pressure close from the Atlantic. Flood Mapping of the UK and Wales indicates a high likelihood of flooding throughout the DCO Proposed Development.
- 6.2.4. Climate change is projected to lead to wetter winters and drier summers although natural variation, including extreme events such as storms and heatwaves will feature in these trends. Rising winter temperatures are likely to reduce the amount of precipitation that falls as snow in winter. It is also predicted that climate change will lead to hotter summers and warmer winters. By 2050, it is likely that sea level rise may pose a flood risk to the DCO Proposed Development.
- 6.2.5. The preliminary assessment has identified that there will be no significant adverse effects during the construction and decommissioning phases of the DCO Proposed Development. Measures to reduce the vulnerability of construction workers and constructions compounds to climate change will be implemented through good site practice and a Construction Environmental Management Plan.
- 6.2.6. The assessment identified that the vulnerability of the operation of the DCO Proposed Development could be impacted by climate change. For example, precipitation could flood or damage above ground compounds, and extreme temperature events could cause joints to expand and cause increased maintenance. Wind could also damage above ground infrastructure, and sea level rise could deteriorate structures. Further consideration will be given to the design in order to reduce any potential effects as the design of the DCO Proposed Development evolves.

6.3. CULTURAL HERITAGE

APPROACH TO THE ASSESSMENT OF CULTURAL HERITAGE

- 6.3.1. Cultural Heritage is the range of our inherited traditions, monuments, objects, and culture. There are specific places or objects that have significant historic value, known as 'heritage assets'. Heritage assets include above ground assets (for example Listed Buildings, Scheduled Monuments) and unknown below ground archaeology.
- 6.3.2. The assessment has identified the heritage assets within the study area through desk-based research and a walkover survey. A geophysical survey is currently underway to better understand the below ground assets which might exist in the area. An assessment of the impacts was undertaken, which looks at the direct and indirect effects of the DCO Proposed Development. Indirect effects relate to impacts on the 'setting' of each heritage asset, which means the surroundings in which the asset is experienced.

PRELIMINARY ASSESSMENT

- 6.3.3. Within the Newbuild Infrastructure Boundary, there are two above ground assets, a scheduled monument (The late medieval moated site, fishpond, and connecting channel at Elton) and a listed building (The Grade II Church of the Holy Spirit). Two Conservation Areas (Thornton-le-Moors and Chester Canal (West)) also extend into the Newbuild Infrastructure Boundary. Further above ground assets exist within 1km of the Newbuild Infrastructure Boundary.
- 6.3.4. In terms of potential below-ground archaeology, the desk-based research has identified the potential for palaeoenvironmental remains, prehistoric remains, roman remains, early medieval remains, later medieval remains, and post-medieval remains within the study area.
- 6.3.5. There may be some direct impacts to unknown below-ground archaeology, during construction of the DCO Proposed Development. An archaeological mitigation strategy will be developed alongside key stakeholders to try and limit any disturbance or damage to archaeology. This will be produced once the results of the geophysical survey work are available, which should provide a better idea of where archaeology is located.
- 6.3.6. There may be some temporary, indirect effects of the DCO Proposed Development on above-ground assets during construction, notably where construction areas impact the setting of nearby assets.
- 6.3.7. There are not expected to be significant effects on above ground heritage assets during operation. This is because any above ground infrastructure only is anticipated to have minimal effects on the setting of above ground assets in the vicinity of the DCO Proposed Development.

6.4. BIODIVERSITY

APPROACH TO THE ASSESSMENT OF BIODIVERSITY

- 6.4.1. Biodiversity is the variety of flora and fauna in an area. Through the use of extensive survey work and desk-based research, the assessment looked at the potential impact of the DCO Proposed Development on protected species and protected or valuable habitats, including nationally and internationally designated sites within the Newbuild Infrastructure Boundary and the surrounding area.

PRELIMINARY ASSESSMENT

- 6.4.2. Within the Newbuild Infrastructure Boundary and the surrounding area, the surveys carried out to date have identified species (including great crested newt, bats, badger, otter, water vole, barn owl, breeding birds, wintering birds and invasive species) and habitats (including ancient woodland, other woodland types, marshes, hedgerows, standing and running water and floodplains) that are protected by law.
- 6.4.3. The study area also includes specific sites that are designated for nature conservation (on a national and international scale), including nine internationally designated sites and thirteen nationally designated sites within 10km of the DCO Proposed Development.
- 6.4.4. The preliminary assessment has identified that there will be no significant adverse effects during the construction, operation, and decommissioning phases of the DCO Proposed Development. However, mitigation measures to reduce any potential effects on biodiversity will be implemented through good site practice and a Construction Environmental Management Plan.
- 6.4.5. In addition, on-going design work will focus on the avoidance of valuable habitats, identified through the survey work, and seek opportunities for biodiversity enhancement measures. This may include habitat creation through the planting of shrubs and trees.

6.5. GREENHOUSE GASES

APPROACH TO THE ASSESSMENT OF GREENHOUSE GASES

- 6.5.1. Greenhouse gas (GHG) emissions occur constantly and widely as a result of natural and human activity, including land use and land use change, transport, energy consumption and industrial processes.
- 6.5.2. Greenhouse gases include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆) and nitrogen trifluoride (NF₃).

- 6.5.3. The GHG assessment considers whether the emissions from the DCO Proposed Development will result in additional or avoided emissions in comparison to current GHG emissions. Where data was available, GHGs that would be emitted over the life of the DCO Proposed Development have been predicted. This has been compared against the existing scenario, which assumes that any construction or operational activities associated with the DCO Proposed Development are not required. Therefore, the existing scenario involves zero GHG emissions.

PRELIMINARY ASSESSMENT

- 6.5.4. The assessment considered the estimated GHG emissions produced by the DCO Proposed Development during construction as a result of the transport of materials to site and the machinery and equipment used.
- 6.5.5. The assessment concluded that the magnitude of GHG emissions during construction and decommissioning will be significant. However, the design of the DCO Proposed Development will consider the implementation of mitigation measures to further reduce the GHG emissions produced. These measures will include using locally sourced materials and local waste disposal facilities, where available, during construction.
- 6.5.6. During operation, the Proposed Development, in combination with other components of the Project (as discussed in Chapter 2 of this NTS) would significantly reduce the amount of GHG entering the atmosphere. As part of the on-going design work, consideration will be given to the inclusion of high efficiency mechanical and electrical equipment as part of the operation and maintenance of the DCO Proposed Development.

6.6. LAND AND SOILS

APPROACH TO THE ASSESSMENT OF LAND AND SOILS

- 6.6.1. The land and soils assessment considers four different aspects of the environment:
- Soil aspects - including impacts on agricultural soil and on sensitive and vulnerable soils.
 - Geology aspects - including impacts on designated areas of geological interest and unstable natural ground.
 - Mineral aspects - including the presence of mineral safeguarding areas and minerals allocations and consents.
 - Contaminated land aspects - including the presence of known or suspected potentially contaminated material associated with operational and closed landfills and other potentially contaminative past activities.

- 6.6.2. The assessment has been informed by desk-based research and ground investigation works which informed the characteristics of the study area, including any potential sources of contamination. In addition, preliminary site visits were undertaken in November 2021 to inspect targeted areas (potential source areas of contamination).

PRELIMINARY ASSESSMENT

- 6.6.3. The study area is predominantly agricultural in nature; however, the baseline assessment identified the presence of historical and current land uses which required further consideration as part of the preliminary assessment, including:
- Historical ground works (known as made ground) which may have introduced contaminants into the soil or water within the study area.
 - Pockets of industrial land use, particularly around the Stanlow Manufacturing Complex.
 - Operational and historic landfill sites.
 - Strategic road and rail infrastructure.
- 6.6.4. The preliminary assessment has identified that there will be no significant adverse effects during the construction, operation, and decommissioning phases of the DCO Proposed Development. However, mitigation measures to reduce any potential effects on sensitive receptors (vulnerable to contamination), agricultural soil, and mineral resource allocations, will be implemented through on-going design work (to avoid sensitive areas), good site practice and a Construction Environmental Management Plan.

6.7. LANDSCAPE AND VISUAL

APPROACH TO THE LANDSCAPE AND VISUAL ASSESSMENT

- 6.7.1. Landscape effects are a combination of the physical changes to the landscape as a result of the DCO Proposed Development and the way these physical changes alter how the landscape is perceived. The landscape assessment considers the effects of the Proposed Development on the landscape as a whole, effects on significant individual elements of the landscape, and effects on characteristic combinations or patterns of elements and how these are seen to affect its character and quality.
- 6.7.2. The visual assessment is concerned with the views that are available to people who may be affected by the DCO Proposed Development (receptors), and their perception of and responses to changes in these views. The assessment considers the likely change to the pleasantness of the view or outlook that the people potentially affected would experience.

- 6.7.3. Desk-based data was reviewed, and site surveys were undertaken to identify suitable specific 'Viewpoints' to better understand the character of the local landscape. Viewpoints were chosen to represent key visual sensitive receptors, including settlements or Public Rights of Way (PRoWs). The impacts of the DCO Proposed Development were assessed in relation impacts on nearby sensitive receptors, including the views of local residents, PRoWs and Conservation Areas, and the visual impact on designated landscapes².

PRELIMINARY ASSESSMENT

- 6.7.4. During construction, the clearance of vegetation and presence of construction equipment/activities would introduce adverse visual effects on a number of residential and recreational receptors and adverse landscape effects on the local landscape character. However, the design of the DCO Proposed Development will consider the implementation of mitigation measures to reduce any adverse effects. These measures may include avoiding the removal of areas of vegetation, locating construction compounds away from residential properties, and temporary screening.
- 6.7.5. During operation, adverse landscape and visual effects are anticipated around the AGIs and BVSSs. However, as part of the ongoing design work, landscape mitigation proposals (including tree and hedgerow planting) will be considered which, over time, will reduce effects. In addition, AGIs and BVSSs will be sited to ensure landscape and visual impacts are minimised where practicable.

6.8. MAJOR ACCIDENTS AND DISASTERS

APPROACH TO THE ASSESSMENT OF MAJOR ACCIDENTS AND DISASTERS

- 6.8.1. A Major Accident is an event that threatens immediate or delayed serious damage to human health, welfare and / or the environment and requires the use of resources beyond those of the Applicant or its contractors to respond to the event.
- 6.8.2. A disaster is a naturally occurring phenomenon such as an extreme weather event (for example storm, flood, temperature) or ground-related hazard events (for example subsidence, landslide, earthquake) with the potential to cause an event or situation that meets the definition of a Major Accident as defined above.

² A landscape designation protects areas deemed to have remarkable natural beauty and/or distinctive character whilst managing development within them and allowing their continued enjoyment by the public.

- 6.8.3. The Major Accidents and Disasters (MAD) assessment considers the potentially significant effects of a development on people and the environment as a result of its vulnerability to, or introduction of, risks of major accidents and/or disasters. The assessment covers risks of external hazards (such as seismic activity or flood risk) on the DCO Proposed Development, as well as what hazards the DCO Proposed Development could pose (such as striking of underground services/utilities or fire and/or explosion at fuel storage facilities).
- 6.8.4. The assessment identifies risks of potential Major Accidents and Disasters along with whether these are managed to be 'As Low As Reasonably Practicable' or if they require further precautionary mitigation actions beyond those already integrated into the design and execution of the DCO Proposed Development.

PRELIMINARY ASSESSMENT

- 6.8.5. The preliminary assessment has determined that all Major Accidents and Disasters events of relevance to the DCO Proposed Development would be managed through the implementation of mitigation actions to be 'As Low As Reasonably Practicable'. Therefore, no significant effects are predicted to occur during construction, operation, or decommissioning.
- 6.8.6. Mitigation actions would include a programme of hazard studies to produce an inherently safe design and to ensure residual risks are managed, and the implementation of various environmental, health and safety management systems.

6.9. MATERIALS AND WASTE

APPROACH TO THE ASSESSMENT OF MATERIALS AND WASTE

- 6.9.1. The materials and waste assessment considered the materials consumed and the waste products produced by the DCO Proposed Development during its lifetime. In particular the assessment considers the following:
- The type and volume of materials to be consumed by the DCO Proposed Development, including details of any recycled materials.
 - The type and volume of waste to be generated by the DCO Proposed Development, with details of planned recovery and / or disposal method (for example on-site reuse, off-site recycling, disposal to landfill).
 - The cut and fill balance of earthworks.
 - Details of any materials to be specified, where sustainability credentials (particularly those that improve resource efficiency) afford performance beyond expected industry standards.

- 6.9.2. The anticipated volumes of materials and waste from the DCO Proposed Development are compared against regional and national landfill capacity or materials/resource availability to assess if the Proposed Development will affect regional resource availability and landfill capacity.

PRELIMINARY ASSESSMENT

- 6.9.3. The preliminary assessment identified that there are currently no severe supply issues regarding supply and stock of key construction materials. In combination with the current information available for the DCO Proposed Development, the potential risk to the construction supply chain is not significant.
- 6.9.4. The DCO Proposed Development passes through and close to several mineral safeguarding areas. Therefore, the DCO Proposed Development has the potential to sterilise these mineral sites by preventing future extraction of the mineral resource. A Mineral Resource Assessment will therefore need to be prepared in order to fully assess the impacts of the DCO Proposed Development on these natural assets.
- 6.9.5. The current land use within the Newbuild Infrastructure Boundary generates minimal volumes of waste. However, forecast analysis of remaining landfill capacity in the North West of England and North Wales suggests that in the absence of future provision, landfill capacity by the completion of the construction phase will be very limited. Therefore, construction methods and activities will need to consider measures for reducing waste as far as practicable.

6.10. NOISE AND VIBRATION

APPROACH TO THE ASSESSMENT OF NOISE AND VIBRATION

- 6.10.1. The noise and vibration assessment considers the production of noise and vibration during the construction and operation of the DCO Proposed Development, and the potential impacts on sensitive receptors which include dwellings, hospitals, schools, nurseries, elderly homes, and places of worship.
- 6.10.2. Baseline data from site surveys was collected to better understand existing (ambient) noise levels within the Newbuild Infrastructure Boundary and the surrounding area. The main sources of noise within the Newbuild Infrastructure Boundary and the surrounding area occur in close proximity to the local road and rail network and local industrial activities. The baseline data was combined with predicted noise levels generated by the construction and operation of the DCO Proposed Development to identify the potential impacts on nearby sensitive receptors.

PRELIMINARY ASSESSMENT

- 6.10.3. The preliminary construction assessment focussed on key activities including open-cut trenching, trenchless crossing techniques, AGIs, BVSs, and construction compounds. The assessment identified the potential for short-term effects on receptors located in close proximity to some of the key construction activities.
- 6.10.4. Mitigation during the construction and decommissioning phases of the DCO Proposed Development will include Best Practicable Means (for example, choosing low noise equipment and optimising the location of equipment/activities). Further measures to reduce noise levels during construction, including localised noise screening, the duration of key activities, and limiting night-time working, will be considered.
- 6.10.5. The preliminary operational assessment focussed on the potential for adverse effects arising from the operation of the AGIs and BVS. At this stage, no significant effects have been identified based on the information available for the DCO Proposed Development and background noise measurements. However, operational noise limits will be discussed with the Environmental Health Departments within each local planning authority.

6.11. POPULATION AND HUMAN HEALTH

APPROACH TO THE ASSESSMENT OF POPULATION AND HUMAN HEALTH

- 6.11.1. The population and human health assessment considers the impact of the DCO Proposed Development on a range of factors associated with land use/accessibility and the health of the local population.
- 6.11.2. Data has been gathered to identify whether the existing population in the vicinity of the DCO Proposed Development is sensitive to changes in access to private property and housing, community land and assets, publicly accessible routes, and human health, which may be caused by the construction and operation of the DCO Proposed Development.
- 6.11.3. The areas immediately adjacent to the DCO Proposed Development consist of industrial and residential properties and agricultural land. Key features include a network of PRowWs, community facilities (including schools, health care facilities, shops, parks etc), agricultural land, and a large number of residential settlements.
- 6.11.4. For the Cheshire West and Chester Region, the health of the population is in line with the North-West Region average. The health of the population in Flintshire, Wales, ranks the highest (best) of all 22 Welsh local authorities, and significantly higher than the Welsh average for mental wellbeing.

PRELIMINARY ASSESSMENT

- 6.11.5. The preliminary assessment has identified that, during construction, the DCO Proposed Development has the potential to:
- Disrupt access to private property and community land and assets.
 - Disrupt recreational routes for walkers, cyclists, and horse riders.
 - Disrupt the use of agricultural land and property.
 - Impact on human health (through increases in noise and air pollution, visual amenity, and a reduction in physical activity).
- 6.11.6. Noting the above, mitigation measures to reduce any potential adverse effects will be implemented as part of the DCO Proposed Development. Mitigation is likely to include specific measures detailed within a Construction Environmental Management Plan and Construction Traffic Management Plan. This could include, for example, maintaining vehicular access to private properties, diversionary routes for PRow, localised noise screening, and a communication strategy which keeps residents informed of all construction activities.

6.12. TRAFFIC AND TRANSPORT

APPROACH TO THE ASSESSMENT OF TRAFFIC AND TRANSPORT

- 6.12.1. The traffic and transport assessment considers the potential for the construction and operation of the DCO Proposed Development to cause changes in traffic levels/volumes on the local and strategic road network. The assessment also considers if the construction and operation of the DCO Proposed Development is likely to impact journey time (for drivers and pedestrians using the local road network), highways safety, and the severance of routes (separation of residents from facilities and services they use within their community).
- 6.12.2. Surveys were undertaken in order to better understand the existing levels of traffic using the local road network. The proposed vehicle movements required during construction and operation were then predicted and compared to the existing traffic levels, in order to see what impacts might occur.
- 6.12.3. The existing local road network includes a variety of routes including the Strategic Road Network (which includes the M56, M53, A5117, A550, A494, A55, and A41 (in part)), the Local Road Network (which includes A540, A548, A5109, and A41) and unclassified rural lanes.

PRELIMINARY ASSESSMENT

- 6.12.4. Given the temporary nature of the construction works and following the implementation mitigation measures, for example implementing a Construction Traffic Management Plan (CTMP), there are not expected to be any significant effects on traffic and transport during construction. The CTMP would include measures such as community engagement, implementation of traffic management and specified HGV construction traffic routes, wheel cleaning facilities, and HGV timing restrictions.
- 6.12.5. The operation of the DCO Proposed Development would not create any notable increase in movements of vehicles, only movements associated with maintenance activities.

6.13. WATER ENVIRONMENT AND FLOOD RISK

APPROACH TO THE ASSESSMENT OF TRAFFIC AND TRANSPORT

- 6.13.1. The Water Environment and Flood Risk assessment considers the potential impacts of the DCO Proposed Development on the quality of the water environment (including surface watercourses and groundwater) and potential changes to flood risk.
- 6.13.2. The potential for the DCO Proposed Development to cause changes to the water quality and hydrological and hydromorphological processes³ is assessed. This could be a result of the introduction or increased concentrations of pollutants or physical changes to watercourses or below-ground works. The potential for the DCO Proposed Development to cause changes to the flood risk in the vicinity of the DCO Proposed Development has also been assessed.
- 6.13.3. Both desk-based data and site walkovers were undertaken to obtain a better understanding of the existing condition of the water environment and existing areas of flood risk. The assessment then considered potential changes which the construction and operation of the DCO Proposed Development could cause on the condition of the water environment and existing areas of flood risk.
- 6.13.4. The DCO Proposed Development will cross a variety of rivers, the Shropshire Union Canal and many other watercourses including streams and ponds. The DCO Proposed Development crosses Flood Zones 3⁴, which is the highest level of flood risk, as well as Flood Zones 2 and Flood Zones 1. The existing quality of the water courses in the vicinity of the DCO Proposed Development varies from being classified as being of poor, moderate and good status⁵.

³ Hydromorphology considers the physical character and water content of water bodies.

⁴ Flood Zone 3 is an area where the annual probability of fluvial and tidal flooding is higher than 1% and 0.5%, respectively, and in the absence of flood defences.

⁵ Under the Water Framework Directive.

PRELIMINARY ASSESSMENT

- 6.13.5. The preliminary assessment has identified that there will be no significant adverse effects during the construction, operation, and decommissioning phases of the DCO Proposed Development. However, mitigation measures to reduce any potential effects on sensitive receptors will be implemented through on-going design work (to avoid sensitive areas and reduce vegetation clearance), good site practice (including sediment and pollution control mechanisms), and a Construction Environmental Management Plan.
- 6.13.6. During operation, it is possible that there would be significant permanent effects on groundwater. This is to be confirmed once detailed design information is available.

6.14. COMBINED AND CUMULATIVE EFFECTS

INTRODUCTION

- 6.14.1. The Environmental Statement will assess the potential for significant combined and cumulative environmental effects as a result of the Proposed Development. Combined and cumulative effects are defined as follows:
- **Intra-Project Combined effects** are the interaction of different environmental effects on the same receptor as caused by the DCO Proposed Development.
 - **Inter-Project Cumulative effects** are the effects caused by the DCO Proposed Development in combination with the effects caused by other developments in a similar area, on the same receptor.

INTRA-PROJECT COMBINED EFFECTS

- 6.14.2. The approach to the assessment of intra-project combined effects will consider the changes in baseline conditions at common sensitive receptors as a result of the DCO Proposed Development. For example, a residential property could be exposed to changes in noise levels and air quality changes as a result of the construction of the DCO Proposed Development.
- 6.14.3. Due to the on-going design development of the DCO Proposed Development, a preliminary assessment of combined effects has not been undertaken for the PEIR. However, the potential intra-project combined effects will be identified and reported within the ES by reviewing the conclusions of the technical topics and their effects on common sensitive receptors.

INTER-PROJECT CUMULATIVE EFFECTS

- 6.14.4. The assessment of inter-project cumulative effects considers the change to existing baseline conditions at sensitive receptors as a result of both the DCO Proposed Development and one or more 'Other Developments'. 'Other Developments' are likely to include other infrastructure projects under construction or under consideration by the Local Planning Authority within a certain distance from the DCO Proposed Development.
- 6.14.5. The assessment will follow a four-stage process. The inter-project cumulative effects assessment for the DCO Proposed Development is currently at Stage 1 - which involves establishing a long list of other developments. This list will be agreed with consultees before a short-list of 'Other Developments' is prepared to inform the assessment. The available environmental information for each of the developments on the short list would be reviewed, and any common environmental impacts would be identified.
- 6.14.6. The cumulative effects assessment will be carried out during the EIA and will be reported in the ES.

6.15. NEXT STEPS

- 6.15.1. Further survey and assessment work will be undertaken and will feed into the design of the DCO Proposed Development.
- 6.15.2. The assessments presented in the PEIR will be revisited once the design of the DCO Proposed Development has been finalised, and complete detailed design information and data is available.
- 6.15.3. The results of the further surveys and assessments will be presented as part of the ES submitted alongside the DCO Application.

7. HAVE YOUR SAY

- 7.1.1. Non-statutory consultation took place in May-June 2021. This PEIR forms part of the current statutory consultation being undertaken which also includes a series of community consultation events.
- 7.1.2. Following consultation on the PEIR, all consultation responses received will be reviewed and considered as part of the ongoing EIA and Project Design processes, and ultimately the production of the final Environmental Statement to be submitted with the application for development consent.
- 7.1.3. Consultation events will be held from 15 February to 11 March 2022 and gives the opportunity to provide feedback or questions on the PEIR. It should be noted that if the dates of the Statutory Consultation period (and any associated event) change, this will be advertised accordingly.

ONLINE EVENTS

- 7.1.4. Three online events will be held over the course of the consultation period. These will be held via live online presentation format including live-chat function, providing communities an opportunity to hear more about the DCO Proposed Development and discuss their views directly with members of the project team. Stakeholders are able to book their place on these events at [REDACTED]

- 7.1.5. The online events are scheduled as follows:

- Saturday 19 February 2022 [1-2pm]
- Thursday 24 February 2022 [6-7pm]
- Friday 11 March 2022 [11am-12pm]

IN-PERSON EVENTS

- 7.1.6. Depending on COVID-19 restrictions not being in place at time of consultation, seven in-person exhibition events will be held. The exhibitions will include materials for members of the public to view information on the DCO Proposed Development. Members of the project team would be available to answer any questions. The proposed events are presented in **Table 7-1**.

Table 7-1: In-Person Consultation Events

Date	Location	Time
Tuesday 15 February 2022	Llanasa Village Hall, Llanasa, Holywell, CH8 9NF	2-4pm
Tuesday 15 February 2022	Talacre Community Centre, Gamfa Wen, Talacre, CH8 9RT	5-7pm
Monday 28 February 2022	Vernon Institute, 62 Hermitage Road, Saughall, CH1 6EN	3-7pm
Saturday 5 March 2022	Connah's Quay Community Centre, Fron Road, Connah's Quay CH5 4PJ	11am - 1pm
Saturday 5 March 2022	Northop Village Hall, High Street, Northop, CH7 6BQ	2-4pm
Saturday 5 March 2022	Queensferry War Memorial Institute, Chester Road West, Queensferry, CH5 1SA	5-7pm
Wednesday 9 March 2022	Ellesmere Port Civic Hall, Civic Way, Ellesmere Port, CH65 0AZ	3-7pm