# Humber Low Carbon Pipelines project

## Supporting jobs and the decarbonisation of the Humber region

**Volume 1 Non-Technical Summary** | October 2022

nationalgrid

# Contents

# 1. Introduction

## 1.1 What is this document?

1.1.1 This non-technical summary presents a summary of the information gathered and preliminary environmental assessment undertaken to date, as outlined in the more technically detailed Preliminary Environment Information Report.

1.1.2 The aim of the non-technical summary is to provide a succinct, understandable and informative overview of the Preliminary Environment Information Report in order to inform stakeholders for statutory consultation.

1.1.3 The Applicant would like to hear your opinion on the Project and the various facets associated with it (for example, the preliminary measures outlined in order to reduce potential negative effects on the environment). Ways of contacting us are included in Section 5.

1.1.4 Table 1 provides a summary of each section to help navigate the document.

**Table 1: Sections of the non-technical summary**

| Section number | Section title | What is included? |
|---|---|---|
| **1** | Introduction | This section contains an introduction to this non-technical summary document. |
| **2** | The Project | This section describes the Project and what is to be built, including details of how it would be built.<br>Chapter 2: Project Description (Volume II) of the Preliminary Environmental Information Report contains further information on the Project. |
| **3** | Environmental Impact Assessment | This section explains how the preliminary environmental assessment has been undertaken and how it will be informed by consultation and stakeholder engagement.<br>Chapter 4: EIA Methodology (Volume II) of the Preliminary Environmental Information Report contains further information on the methodology of the environmental assessments. |
| **4** | Summary of environmental assessment and impacts | For each of the environmental topics considered as part of the Environmental Impact Assessment, this section provides an overview of what is being assessed and the results of the preliminary assessment.<br>Chapters 5 to 20 (Volume II) of the Preliminary Environmental Information Report contain further information on the preliminary environmental assessments undertaken. |

| Section number | Section title | What is included? |
|---|---|---|
| **5** | Have your say | This section explains how you can have your say on the proposals. |
| **6** | What are the next steps? | This section explains what happens next in the Environmental Impact Assessment process. |

# 2. The Project

## 2.1 What is the Humber Low Carbon Pipelines Project?

2.1.1 The Humber Low Carbon Pipelines Project ('the Project') would comprise the simultaneous construction of a dual pipeline system (one carbon dioxide and one hydrogen) as well as associated above ground installations. The purpose of the Project (as detailed in Chapter 2: Project Description (Volume II) of the Preliminary Environmental Information Report) is to transport captured carbon dioxide from the region's industrial emitters for safe storage offshore, and to transport low carbon hydrogen for use in regional industries to replace fossil fuels.

2.1.2 The pipelines would connect to major industrial emitters and power stations in the Humber region, to comprise the Drax Bioenergy with Carbon Capture and Storage Project, SSE Thermal and Equinor's Keadby Clean Power Hub, British Steel's Zero Carbon Humber Scheme, Uniper's Blue and Green Hydrogen Hub and Equinor's Hydrogen to Humber Saltend Project (these are referred to as Connected Projects). Further, the Project's carbon dioxide pipeline would connect to bp's Northern Endurance Partnership project that would provide offshore transport of carbon dioxide for safe subsea storage. Other industrial emitters could connect to the Project in the future, depending on the regulations and legislation in place at the time.

2.1.3 The proposal is a 'Nationally Significant Infrastructure Project' under the Planning Act 2008, which requires the Project to obtain permission before construction and operation can commence. This permission is called a development consent order. The development consent order application will be examined by the Planning Inspectorate which will report its findings to the Secretary of State for Business, Energy and Industrial Strategy to aid decision making.

2.1.4 National Grid Carbon Limited is the Applicant for the Project. National Grid Carbon Limited is part of National Grid Ventures, the competitive division of National Grid plc, responsible for both developing and operating a portfolio of low carbon renewable businesses in the United Kingdom and United States.

## 2.2 Why do we need the Project?

2.2.1 The UK Government has set legally binding net zero carbon dioxide emissions target that include a commitment for the UK to achieve net zero by 2050. The Humber region has a high concentration of energy intensive industries concentrated in a 'cluster' and is also the UK's most carbon intensive region.

2.2.2 The objective of this Project is to deliver new onshore pipeline infrastructure within the Humber region. This would transport captured carbon dioxide from the region's industrial emitters for safe storage offshore and would transport low carbon hydrogen for use in regional industries to replace fossil fuels.

2.2.3 The Project forms part of Zero Carbon Humber, a consortium of leading energy and industrial companies and academic institutions with a shared vision to transform the Humber region into a net zero carbon cluster by 2040. Zero Carbon Humber together with Net Zero Teesside and the Northern Endurance Partnership, forms the East Coast

Cluster (for further details refer to Section 2.2 of Chapter 2: Project Description (Volume II)). In October 2021, the East Coast Cluster was selected by the Government as one of the UK's first two carbon capture, usage and storage clusters.

## 2.3 What are the key elements of the Project?

2.3.1 As discussed above, the Project shall comprise the simultaneous construction of a dual pipeline system (one for carbon dioxide and one for hydrogen), as well as the associated above ground installations. The majority of the carbon dioxide pipeline would be up to 600 mm (24") nominal diameter and the hydrogen pipeline would be up to 900 mm (36") nominal diameter. This is referred to as the Base Case in the Preliminary Environmental Information Report. Also considered within the Preliminary Environmental Information Report is the possibility of deploying a larger diameter carbon dioxide pipeline, with a nominal diameter up to 750 mm (30") (with the hydrogen pipeline remaining the same diameter as within the Base Case). This is referred to as Sensitivity 1 within the Preliminary Environmental Information Report. Further information on this can be found in Chapter 2: Project Description (Volume II) of the Preliminary Environmental Information Report.

### The two pipelines

2.3.2 The carbon dioxide and hydrogen pipelines would extend from Drax in North Yorkshire to a Pump Facility at Easington in East Riding of Yorkshire. The hydrogen pipeline would end at the Pump Facility; however, the carbon dioxide pipeline would continue offshore for onward transportation to an offshore carbon dioxide storage area, known as Endurance.

2.3.3 It is important to note here that the offshore carbon dioxide pipeline and offshore carbon dioxide storage area (referred to earlier as bp's Northern Endurance Partnership project) is subject to a separate consenting regime, with the application process separately led by bp. The Humber Low Carbon Pipelines Project ends at mean low water spring (i.e. the mean point of low tide heights observed in the area).

2.3.4 The pipelines would be buried underground along their entire length, apart from where sections are at surface level within the above ground installations. The minimum depth from the top of the pipe to the ground surface is typically 1.2 m but this would be deeper when the pipelines need to avoid existing services and physical obstructions (for example, some roads, rivers and railways infrastructure).

2.3.5 The Applicant continues to liaise with local stakeholders, including individuals, communities, landowners and occupiers and local authorities to understand the potential impact of the Project, as well as working with engineering and environmental experts, to refine the route.

2.3.6 The route of the pipelines is presented in the non-technical summary figure pack (Figure 1).

### Above ground installations

2.3.7 In addition to the pipelines, the Project would include some above ground installations. These are securely fenced compounds which provide the transition between the pipeline systems and the Connected Projects. Types of above ground installations are as follows:

- **Pipeline Inspection Gauge Traps:** These house facilities for cleaning and inspecting the pipelines.


- **Block Valve Stations:** Block valves are used to isolate and monitor sections of pipeline.


- **Multi-junctions:** This is at the connection point of a number of buried pipelines. It accommodates a Pipeline Inspection Gauge Trap for each pipeline.


- **Pump Facility:** This is proposed near to the landfall location at Easington to pressurise the carbon dioxide for onward transportation to the offshore subsea storage site.


- **Cathodic Protection Transformer Rectifier Cabinets:** Cathodic protection cabinets would be installed along the pipelines to help protect them against 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. They also provide an important role when the pipeline is being inspected during operation.

2.3.8 Table 2 includes the likely maximum dimensions of each type of above ground installation.

**Table 2: Above ground installation dimensions**

| Above ground installation type | Maximum dimensions |
|---|---|
| **Pipeline Inspection Gauge Traps** | Approximately 120 m x 165 m (operational area).<br>Surrounded by security fencing of up to 3 m high and, if required, surrounded by a 25 m wide natural planting strip to reduce any visual effect.<br>Maximum building height approximately 8 m (temporary vent stack maximum height approximately 5 m). |
| **Block Valve Stations** | Carbon dioxide installation - Approximately 90 m x 90 m (operational area).<br>Hydrogen installation - Approximately 90 m x 90 m (operational area).<br>Surrounded by security fencing of up to 3 m high and, if required, surrounded by a 25 m wide natural planting strip to reduce any visual effect.<br>Maximum building height approximately 8 m (temporary vent stack maximum height approximately 5 m). |
| **Multi-junctions** | Approximately 180 m x 180 m (operational area).<br>Surrounded by security fencing of up to 3 m high and, if required, surrounded by a 25 m wide natural planting strip to reduce any visual effect.<br>Maximum building height approximately 8 m (temporary vent stack maximum height approximately 5 m). |
| **Pump Facility** | Approximately 500 m x 350 m (operational area).<br>Surrounded by security fencing of up to 3 m high and, if required, surrounded by a 25 m wide natural planting strip to reduce any visual effect.<br>Maximum height of the vent stack 50 m. |
| **Cathodic Protection Transformer Rectifier Cabinets** | Approximately 1 m high x 0.5 m wide x 0.5 m deep. |
| **Marker Posts** | Up to approximately 1.2 m high. |

2.3.9 The locations of above ground installations are presented in the non-technical summary figure pack (Figure 1) and further details are provided in Section 2.5 of Chapter 2: Project Description (Volume II) of the Preliminary Environmental Information Report.

## Summary of the key elements of the Project

2.3.10 The DCO Application will seek consent for the following key elements which form the Project:

- An onshore pipeline system to transport carbon dioxide from industrial and power sector Connected Projects, including power generators and hydrogen production plants in the Humber area. This includes interconnecting carbon dioxide pipelines between the main pipeline system and Drax, British Steel and the Hydrogen to Humber Saltend project.
- An onshore pipeline system to transport hydrogen from production plant Connected Projects to end users (aligned with the carbon dioxide pipeline). This includes interconnecting hydrogen pipelines between the main pipeline system and Drax, British Steel and the Hydrogen to Humber Saltend project.
- A tunnel beneath the Humber Estuary including launch and receiving arrangements.
- Above ground installations including:
  - A carbon dioxide and a hydrogen pipeline inspection gauge trap arrangement at or in the vicinity of Drax Power Station;
  - A carbon dioxide and a hydrogen block valve between Drax and Keadby;
  - A carbon dioxide and a hydrogen connection arrangement at Keadby 3 Power Station;
  - Connecting arrangements onto the main carbon dioxide and a hydrogen pipelines incorporating a block valve with pipeline inspection gauge trap arrangements for the interconnecting pipelines to British Steel;
  - A pipeline inspection gauge trap facility at British Steel;
  - Two carbon dioxide and a hydrogen block valves between British Steel and Killingholme;
  - A multi-junction at Killingholme;
  - A multi-junction at Hedon;
  - A carbon dioxide and a hydrogen PIG trap at Saltend;
  - A carbon dioxide and a hydrogen block valve between Saltend and Easington; and
  - A Pump Facility (including pipeline inspection gauge trap) at Easington, to increase the pressure of the carbon dioxide for transportation offshore to the storage facility.

    Note, for some above ground installations various options are currently being considered.
- A landfall at Easington which is the ‘landing’ point for the offshore carbon dioxide pipeline transportation system so it can connect into the Pump Facility and is where the carbon dioxide transportation pipeline infrastructure transitions from the onshore to the marine environment.

## 2.4 Construction

### Overview

2.4.1 Construction is anticipated to commence in 2025 and envisaged to be completed by the end of 2027. Not all locations would be subject to construction works for the entire length of the Project construction phase.

2.4.2 Standard construction working hours would be Monday-Saturday 07:00 to 19:00 hrs and travel to and from site is likely to happen an hour either side of these hours. The requirement to work on Sunday or bank holidays cannot be excluded, although it would not be usual, on these days the working hours would be 07.00 to 17.00 hrs.

2.4.3 Twenty-four-hour working would be required to align with critical work activities such as tunnelling, testing or works associated with offshore interfaces.

### Pipeline construction

2.4.4 The pipelines would be constructed via the excavation of an open trench, lowering of the pipe into it and then refilling the trench with the excavated material (this is known as backfilling).

2.4.5 Construction works would generally be contained within a fenced working area, termed the construction working width. The construction working width for the pipeline would be approximately 80-100 m 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.

2.4.6 The sequence of activities for pipeline construction in rural areas would typically comprise:

- The construction working width, i.e. the total area within which construction work would take place, is marked out;
- The topsoil is carefully stripped and stored next to the route;
- The pipelines are delivered in short lengths and placed on supports. These short lengths of pipeline are welded together into longer sections called ‘strings’;
- The pipeline trenches are dug, with excavated material being stored separately from the topsoil on the opposite side of the trenches;
- The pipeline ‘strings’ are lowered into the trenches using special vehicles called ‘side booms’ and welded to the pipeline already laid;
- The trench is filled in using the previously excavated material and the topsoil reinstated; and
- Following reinstatement, the land is returned to its previous use.

2.4.7 For crossings of railway lines, major roads (motorways and A-roads), main rivers, the cliff at Easington and other major infrastructure, specialist trenchless techniques would be used. A trenchless technique is a method that allows the pipeline to be installed without disturbing the ground surface. The locations where a trenchless crossing technique would be used are in presented in the non-technical summary figure pack (Figure 1). Further details on the construction phase can be found in Section 2.8 of

Chapter 2: Project Description (Volume II) of the Preliminary Environmental Information Report.

## Above ground installation construction

2.4.8 The above ground installations would typically be constructed as follows:

- Pre-construction activities (for example, the creation of temporary working areas);
- Construction of an access road if required or upgrading of an existing access way;
- Installation of below ground works (such as, concrete foundations);
- Construction of above ground structures (for example, above ground pipework and equipment);
- Installation of pipeline and equipment and associated infrastructure;
- Connection to utilities/services (for example, electrical, telecommunications etc);
- Testing activities and commissioning; and
- Perimeter reinstatement landscape works and removal of temporary infrastructure.

## Temporary working areas

2.4.9 Temporary working areas would be required to facilitate construction activities. The likely types of temporary working areas are as follows:

- Construction working width along the length of the route (including temporary accesses);
- Trenchless crossing compounds;
- Above ground installation laydown areas;
- Site offices;
- Welfare, yard and workshop facilities;
- Pipe delivery areas; and
- Compound for crossing of the cliffs and inter-tidal zone.

2.4.10 The locations of temporary working areas are presented in the non-technical summary figure pack (Figure 1).

# 2.5 Operation and maintenance

2.5.1 The pipelines would be designed, constructed, operated and maintained in accordance with relevant industry codes of practice, standards and recommended practice. The pipelines from Drax to the Pump Facility as well as the above ground installations would have an operational design life of at least 40 years. The carbon dioxide pipeline from the Pump Facility to mean low water spring and the pipeline inspection gauge trap at the Pump Facility would have an operational design life of at least 25 years. In reality, the pipelines would likely be operational for longer than their design lives.

2.5.2 Once the pipelines are in operation, they would be monitored around the clock, every day of the year, by a remote fully staffed central control room (the central control room does not form part of this Project).

2.5.3 A programme of inspection would be required in order to maintain and inspect the pipelines. This includes flyover or walking surveys, security and maintenance visits, pipeline testing and condition assessments. Planned maintenance of the above ground installations would be undertaken up to twice a year in compliance with all safety requirements. Planned maintenance would include venting of carbon dioxide and hydrogen from the above ground installations. The carbon dioxide and hydrogen vented would be small in volume, short term and an infrequent event.

2.5.4 For further information on the operation and maintenance of the Project refer to Section 2.9 of Chapter 2: Project Description (Volume II) of the Preliminary Environmental Information Report.

## 2.6 Decommissioning

2.6.1 When they reach the end of their operational life, the pipelines would be safely decommissioned. It is anticipated that the pipelines would be made safe and left in the ground. The above ground installations would be dismantled, all equipment would be removed and the land returned to agricultural or other appropriate uses.

2.6.2 For further information on the decommissioning of the Project refer to Section 2.10 of Chapter 2: Project Description (Volume II) of the Preliminary Environmental Information Report.

## 2.7 Consideration of alternatives

2.7.1 A number of alternatives have been looked at in terms of: (i) alternative pipeline routes and (ii) alternative locations of above ground installations. The design and siting of the Project will continue to evolve following statutory consultation and the final design will be reported in the Environmental Statement submitted as part of the development consent order application.

2.7.2 Table 3 provides a summary of the consideration of alternatives undertaken to date. For further information refer to Chapter 3: Consideration of Alternatives (Volume II) of the Preliminary Environmental Information Report.

**Table 3: Alternatives Considered**

| Scenario | Description | Findings |
|---|---|---|
| **Alternative landfall locations** | A total of seven preliminary landfall locations were identified. An assessment was undertaken of these which included a wide range of constraints – more specifically, biological environment, landscape, historic, land use and planning, infrastructure, physical environment, | Based on this analysis, the options were narrowed down to Atwick, Easington and Aldbrough. Atwick was ruled out on the basis of distance, cost and proximity to sensitive receptors. When assessing the remaining landfall locations, both Aldbrough and Easington were |

| Scenario | Description | Findings |
|---|---|---|
| | settlement and population, tourism and recreation. | considered more viable, shorter and with fewer environmental interactions. Both locations were taken forward to non-statutory consultation.<br><br>Easington was subsequently selected as the preferred landfall location, as part of a joint decision between the Applicant and bp when taking into account both onshore and offshore considerations. |
| **Alternative north or south route configurations** | Two main ways to attach the Connected Projects were considered - namely, to the north and the south of the Humber Estuary. An assessment was undertaken to decide which is the preferred option. | The assessment revealed that the southern configuration was preferred because there would be greater effects should a northern route configuration be taken forward on several of the environment/ socio-economic sub-topics including Landscape and Visual, Historic Environment, Water Environment, Soils and Geology, Settlement and Population, Tourism and Recreation, Traffic and Access and Land Use. |
| **Alternative southern route configuration** | Once it was decided that the preferred option was the southern configuration option, three pipeline routes were identified and assessed. | On the basis of the assessment, it was decided that all three pipeline routes should be taken forward to non-statutory consultation based on the overall balance of environmental, socio-economic, technical and costs considerations. Upon receipt of the feedback from the non-statutory consultation in September - October 2021 and further studies to |

| Scenario | Description | Findings |
|---|---|---|
| | | consider environmental, socio-economic, technical and planning constraints, a single preferred configuration was selected and refined. This is the configuration selected for this statutory consultation. |
| **Alternative above ground installation sites** | Consideration of different locations for the above ground infrastructure sites. | The location of each above ground infrastructure is largely dictated by its ability to maximise opportunities to link to the Connected Projects. The size of each above ground infrastructure will be driven by the infrastructure requirements (for example, number of pipeline connections) and the avoidance of existing utilities, certain land use and environmental constraints. |

# 3. Environmental Impact Assessment

## 3.1 What is an Environmental Impact Assessment?

3.1.1 The purpose of Environmental Impact Assessment is to identify the potential environmental impacts from a development and then propose the means to avoid and reduce the impacts. This information is then presented in an Environmental Statement to assist regulators in the decision-making process.

3.1.2 Assessments are made on the significance of an effect on a wide range of receptors, including physical, biological and human, and mitigation measures are proposed to reduce any significant effects.

3.1.3 This Preliminary Environmental Information Report presents a snapshot in time of how the Environmental Impact Assessment is progressing and presents an early indication of significant effects.

### Assessment Parameters and 'Rochdale Envelope' Approach

3.1.4 The design will continue to be progressed and there will be a need to continue refining the design up to the detailed design stage, requiring a certain level of flexibility to be maintained. A limit of deviation and parameter-based approach will be adopted to define the envelopes within which the construction and operation of the Project would be undertaken. This approach (referred to as the 'Rochdale Envelope') is well-established for large scale infrastructure projects and ensures that the maximum envelope within which the Project may be undertaken is assessed and ensures the assessment of effects associated with the Project will be worst case.

## 3.2 How have the environmental impacts been identified and assessed?

3.2.1 The Applicant submitted an Environmental Impact Assessment Scoping Report to the Planning Inspectorate in April 2022. A response to this (the 'Scoping Opinion') was received from the Planning Inspectorate in May 2022 which included comments from a range of stakeholders. The Scoping Opinion has formed the basis of this Preliminary Environmental Information Report and will form the basis of the Environmental Statement by identifying and confirming the topics that require assessment.

3.2.2 Within this Preliminary Environmental Information Report, for each topic, a description of the current environmental baseline has been identified through a combination of desk-based study, environmental surveys and consultation. Potential impacts of the construction, operation and decommissioning of the Project have been identified. A preliminary assessment has then been made on the severity of each potential impact and where needed; mitigation measures have been proposed to reduce impacts to acceptable levels where possible.

3.2.3 The Project has taken a proactive approach to avoid or minimise environmental effects and all mitigation measures (i.e. commitments) will be presented within a Register of Commitments as part of the Environmental Statement.

# 4. Summary of the Environmental Assessment and Impacts

## 4.1 Agriculture and Soils

4.1.1 The Project is located in an area that is predominantly agricultural in nature, with extensive areas of land under arable production and occasional woodland blocks, some of which are under Woodland Grant Schemes.

4.1.2 The preliminary assessment has identified potential significant effects associated with the permanent loss of small areas of agricultural land and soil functions during operation due to the location of the above ground installations. This will be confirmed by the completion of Agricultural Land Classification and soil surveys expected to take place between the Preliminary Environmental Information Report and the Environmental Statement.

4.1.3 There were no other potential significant effects identified at this stage during the construction, operation or decommissioning phases of the Project. However, mitigation measures to reduce any potential effects on sensitive agricultural receptors (including the grade of agricultural land) have been proposed, including (but not limited to) on-going design work (to avoid sensitive areas where practicable) and good site practice measures in relation to approaches to soil handling that would be documented in a Construction Environmental Management Plan.

4.1.4 For further information refer to Chapter 5: Agriculture and Soils (Volume II) of the Preliminary Environmental Information Report.

## 4.2 Air Quality

4.2.1 The existing baseline for air quality was evaluated using data from publicly available sources. In general, given the predominantly rural nature of the Study Area, the concentrations of airborne pollutants are within the air quality objectives[1] and therefore, existing air quality is generally considered to be 'good', with the exception of two nearby Air Quality Management areas located near the construction transport routes, one in Hull and the other in Scunthorpe.

4.2.2 The preliminary assessment has identified that there would be no significant adverse effects during the construction and decommissioning phases of the Project. However, this will be assessed in more detail within the Environmental Statement after the assessment of nitrogen dioxide and particulate matter (PM10 and PM2.5) concentrations (as a result of construction vehicle emissions) is completed, along with a construction dust assessment. Measures to control airborne pollutants would be implemented through good site practice measures that would be documented in a Construction Environmental Management Plan.

[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

4.2.3 The preliminary assessment has identified that there would be no significant adverse effects on air quality during the operation of the Project. There would be a requirement to vent carbon dioxide at the above ground installations during planned maintenance activities, however, the design of the venting equipment at the above ground installations would ensure that any airborne pollutants released into the atmosphere are controlled.

4.2.4 For further information refer to Chapter 6: Air Quality (Volume II) of the Preliminary Environmental Information Report.

## 4.3 Ecology and Biodiversity

4.3.1 The predominant habitats within the area surrounding the Project include mainly arable habitat with areas of running water, semi-improved and poor semi-improved neutral grassland, built areas and hardstanding, improved grassland and various types of woodland.

4.3.2 The Project crosses (using trenchless techniques to avoid direct impacts) six sites with statutory designations for ecological features, more specifically:

- Humber Estuary Ramsar;
- Humber Estuary Special Area of Conservation;
- Humber Estuary Special Protection Area;
- Greater Wash Special Protection Area;
- Humber Estuary Site of Special Scientific Interest; and
- Holderness Inshore Marine Conservation Zone.

4.3.3 There are a further 18 statutory designated sites within the 2 km of the Project.

4.3.4 Various desk-based and field surveys to characterise the ecology of the area (including surveys for habitats, birds and bats) have been undertaken and will continue until April 2023. To date, priority habitats, ancient woodland, arboricultural features (Tree Preservation Orders and veteran trees), notable plants, protected and notable invertebrates (terrestrial and aquatic), fish, badgers, otters, low numbers of common bats, water vole, amphibians (including great crested newt), reptiles, polecat, pine marten, brown hare, hedgehog, harvest mouse and Non- Native Invasive Species are located within close proximity (within 2 km) of the Project. Habitat within the Project and the surrounding area has the potential to support passage, breeding and/or non-breeding birds.

4.3.5 A Habitats Regulations Assessment will be carried out to determine any likely significant effects on the qualifying features (predominantly breeding, passage and wintering birds) of European sites. Mitigation measures to reduce any potential effects on biodiversity have been proposed and would include good site practice measures that would be documented in a Construction Environmental Management Plan and a Decommissioning Environmental Management Plan. As a result of this, the preliminary assessment has identified that there would be no significant adverse effects during the construction, operation or decommissioning phases of the Project.

4.3.6 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. The Applicant is committed to adopting a sustainable approach to

development and continues to develop a Conservation Strategy to drive strategic, landscape-scale habitat reinstatement and enhancement. The Conservation Strategy would ensure that the Project leaves the environment in a better condition than it was before development, i.e. delivering Net Gain.

4.3.7 For further information refer to Chapter 7: Ecology and Biodiversity (Volume II) of the Preliminary Environmental Information Report.

## 4.4 Climate Resilience

4.4.1 The Climate Resilience assessment considers the vulnerability of the Project to any future changes in climatic variables. These climatic variables include storms, droughts, extreme weather events, and sea level rise, among others. The assessment involves a review of the likely future changes to the climate variables where the Project is located, and an assessment of the potential impacts these changes could have on each element of the Project (including its construction).

4.4.2 Climate change is projected to lead to wetter winters and drier summers and more frequent 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.

4.4.3 The Project crosses the Humber Estuary and out to mean low water spring. These areas are vulnerable to sea level rise. Large parts of the Project are within areas of flood risk.

4.4.4 By ensuring that climate mitigation measures are ingrained into the Project's design, the potential for the various aspects of climate change to adversely impact the Project is considered to be managed to be as low as reasonably practicable. Therefore, the preliminary assessment has identified that there would be no significant adverse effects during the construction, operation and decommissioning phases of the Project. Alongside the measures integrated into the Project's design, additional measures to reduce the vulnerability of construction workers and constructions compounds to climate change would be implemented through good site practice measures that would be recorded in a Construction Environmental Management Plan.

4.4.5 For further information refer to Chapter 8: Climate Resilience (Volume II) of the Preliminary Environmental Information Report.

## 4.5 Geology and Hydrogeology

4.5.1 A brief summary of the geology and hydrogeology for the site is presented below:

### Geology

4.5.2 The geology consists of:

- Superficial deposits (Breighton Sand Formation, Warp, Alluvium, Sutton Sand Formation Head, Till, Glaciofluvial, Beach and Tidal Flat deposits); and
- Bedrock geology (Sherwood Sandstone Group, Mercia Mudstone Group, Scunthorpe Mudstone Formation, Welton Chalk Formation, Burnham Chalk Formation, Kimmeridge Clay Formation, West Walton Formation, Oxford Clay

Formation, Kirkton Cemenstone Beds, Frodingham Ironstone Member, Charmouth Mudstone Formation, Marlstone Rock Formation and Flamborough Chalk Formation).

4.5.3 A small segment of the area surrounding the Project is classified as a Coal Mining Reporting Area, this is located along the east bank of the Humber Estuary

4.5.4 There is one Site of Special Scientific Interest designated for its geology, namely Dimlington Cliff, which the Project crosses using a trenchless technique.

### Hydrogeology

4.5.5 The hydrogeology consists of:

- Underlying aquifers (Principal, Secondary A & B and undifferentiated) – controlled waters.

4.5.6 Several Water Framework Directive groundwater bodies are also present. Both Source Protection Zones and Nitrate Vulnerable Zones have been identified, these are areas which are vulnerable to changes in groundwater chemistry

4.5.7 There are a number of potential impacts that are considered including chemical spillages and leaks from construction plant and machinery, chemicals and other contaminants stored on site causing the potential pollution of ground or groundwater.

4.5.8 Further there are potential requirements to dewater the ground to allow for access which may reduce the flow to groundwater supported sites, abstractions and surface water bodies. These impacts and the associated potential effects would be managed via integration into the design of the Project, good practice measures that would be recorded in a Construction Environmental Management Plan, and a programme of ground investigations and monitoring. As a result of the mitigation measures outlined, the preliminary assessment has identified that there would be no significant adverse during the construction, operation and decommissioning phases of the Project.

4.5.9 For further information refer to Chapter 9: Geology and Hydrogeology (Volume II) of the Preliminary Environmental Information Report.

## 4.6 Cultural Heritage

4.6.1 The Project would be located in areas of North Yorkshire, the East Riding of Yorkshire, North Lincolnshire, and West Lindsey, which have a rich historical and archaeological heritage. Activity is known in the area from the Palaeolithic period through to the modern day. The activity can be found as archaeological finds and features, built heritage and from changes within the landscape (field layout/boundaries for example). 19 Scheduled Monuments, 14 Grade I Listed Buildings,11 Grade II* Listed Buildings, 163 Grade II Listed Buildings and one Registered Park and Garden are located along the route and surrounding area (500 m from the pipelines, 1.5 km from above ground infrastructure and 5 km from the Pump Facility).

4.6.2 The preliminary assessment has collated data from the respective local historic environmental records for use in assessment, alongside other designated heritage data sets.

4.6.3 The preliminary assessment presents a worst case and has identified potential significant effects on up to 265 heritage assets, along the length of the Project

(approximately 130 km) (However, this is expected to reduce substantially following Project design refinement). Significant effects would be caused during construction of the Project having a physical impact to a heritage asset or changing the heritage asset's setting, through an increase in construction traffic and noise. Significant effects during operation would be due to a permanent change in an asset's setting, due to the presence of an above ground installation, altering how a heritage asset is experienced. No impacts are anticipated at decommissioning as works would have previously removed respective heritage assets.

4.6.4 A number of mitigation methods are suggested for Project impacts on cultural heritage including archaeological excavation and recording, reinstatement of land to limit changes in setting, landscaping to screen visual sight during operation and good practice measures during construction that would be recorded within a Construction Environmental Management Plan.

4.6.5 To further inform the understanding of the cultural heritage along the route, further work including a geoarchaeological desk-based assessment, geophysical survey and trial trenching will be undertaken. The relevant local authority representatives are being engaged on the scope and timing of this further work.

4.6.6 For further information refer to Chapter 10: Cultural Heritage (Volume II) of the Preliminary Environmental Information Report.

## 4.7 Landscape and Visual

4.7.1 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. The impacts of the Project were assessed in relation to nearby sensitive receptors, including the views of local residents, public rights of way and conservation areas, and the visual impact on designated landscapes[2].

4.7.2 There are no nationally designated landscapes such as Areas of Outstanding Natural Beauty within the Project's landscape and visual study area. The majority of the Project lies within a generally open, expansive and low-lying landscape interspersed with large and medium infrastructure elements, with varying levels of tree cover and built form which serve to limit inter-visibility in some locations and directions.

4.7.3 The majority of landscape and visual disturbance associated with the Project would be associated with the construction and decommissioning phases which would be temporary in nature and of relatively short duration. Potential landscape and visual impacts may arise from the operational stages of the above ground installations depending on location and scale.

4.7.4 The design of the Project will consider the implementation of mitigation measures to reduce any potential adverse effects. These measures include (but are not limited to) the siting of construction compounds within areas of limited population or on previously developed sites (where possible) where existing views of the landscape are influenced by existing urbanising features, where practicable the removal of areas of vegetation would be avoided and good practice construction measures would be followed and recorded within a Construction Environmental Management Plan. Replanting of trees

[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.

and hedgerows would also be undertaken as part of the mitigation in conjunction with biodiversity measures.

4.7.5 For further information refer to Chapter 11: Landscape and Visual (Volume II) of the Preliminary Environmental Information Report.

## 4.8 Noise and Vibration

4.8.1 The majority of the Project is located within a rural setting, typically comprising agricultural land use. The acoustic environment varies significantly along the route depending on proximity to prominent noise sources; these sources will include agricultural activities, road and rail infrastructure, industrial facilities, commercial premises/activities, wind turbines, an airport and the North Sea.

4.8.2 The preliminary construction assessment focussed on key activities including open-cut trenching, trenchless crossing techniques, above ground installations 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.

4.8.3 Mitigation during the construction and decommissioning phases of the Project would 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.

4.8.4 At this stage, the location and configuration of the Pump Facility have not been defined and therefore the details of noise emitting plant/equipment is not available to carry out operational phase noise predictions. Baseline surveys have been undertaken to establish the background sound levels at sensitive receptors in the area surrounding the Pump Facility, which will be used to inform the operational phase noise assessment. The operational phase noise assessment will be undertaken as part of the subsequent Environmental Statement and will identify the requirement for any acoustic mitigation measures.

4.8.5 For further information refer to Chapter 12: Noise and Vibration (Volume II) of the Preliminary Environmental Information Report.

## 4.9 Socio-economics, Tourism and Recreation

4.9.1 Desk-based data was reviewed, and site surveys were undertaken to establish the underlying socio-economic conditions to inform the subsequent preliminary assessment.

4.9.2 The preliminary assessment has identified that, during construction, the Project has the potential to have a beneficial impact on the local workforce and supply chains through the creation of jobs and by upskilling the local workforce. Whilst a likely significant effect relates to a beneficial impact upon the local economy, the design of the Project will consider the implementation of mitigation measures to reduce any potential adverse effects.

4.9.3 These mitigation measures include (but are not limited to) appropriate footpath diversions as well as ensuring the public are appropriately informed of the nature, timing and duration of particular construction activities. Also, the routeing and siting process has, where practicable, avoided socio-economic receptors/features such as businesses,

schools, community facilities etc. which reduce the potential for any adverse impacts occurring.

4.9.4 For further information refer to Chapter 13: Socio-economics, Tourism and Recreation (Volume II) of the Preliminary Environmental Information Report.

## 4.10 Human Health and Wellbeing

4.10.1 Data has been gathered to identify whether the existing population in the vicinity of the Project are 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 and decommissioning of the Project.

4.10.2 The surroundings adjacent to the Project consist of agricultural land, industrial areas and residential properties. Key features include a network of public rights of way, community facilities (including schools, health care facilities, shops, parks etc), agricultural land and a number of residential settlements. There are some health sensitivities in relation to vulnerable groups and health inequalities – for example, in some surrounding areas, there is an ageing population and childhood obesity. In the areas surrounding the Project, there are also some areas of long-term unemployment and fuel poverty. Coastal areas are known to experience health inequalities and are therefore also sensitive to changes in health.

4.10.3 The preliminary assessment has determined there are no likely significant effects to health and wellbeing as a result of the Project. However, it must be noted that the potential impact on the surrounding air quality and the associated health risks will be determined later and outlined within the Environmental Statement. Where practicable, the Project has been designed to avoid direct impacts onto the surrounding social infrastructure, public rights of way, cycling and walking infrastructure and areas of open space. Furthermore, a Public Right of Way Management Plan would be implemented to ensure that where it is necessary to cross a public right of way the route would be adequately diverted and sign posted accordingly.

4.10.4 For further information refer to Chapter 14: Human Health and Wellbeing (Volume II) of the Preliminary Environmental Information Report.

## 4.11 Traffic and Transport

4.11.1 Desk-based data was reviewed and revealed the Preliminary Construction Routes which will be utilised for construction traffic. Two sets of construction routes are considered within the preliminary assessment: the initially selected Preliminary Construction Routes and the Emerging Construction Routes. These construction routes are shown in Figures 2 and 3 within the non-technical summary figure pack. The Emerging Construction Routes detail changes that are being considered to the initially proposed Preliminary Construction Routes on the basis of engagement with the local highway authorities. Engagement is still ongoing and the finalised construction routes will be detailed within the Environmental Statement.

4.11.2 Both the Preliminary Construction Routes and Emerging Construction Routes where practicable, have been developed to avoid existing highways constraints, settlements, sensitive receptors, single carriage roads, to utilise the shortest available route and to use A roads as a priority before exploring B and C roads. It is noted that there are a

number of public rights of way crossing or linking the roads along the construction routes.

4.11.3 Given the temporary nature of the construction and decommissioning works and following the implementation mitigation measures, for example implementing a Construction Traffic Management Plan, there are not expected to be any significant effects on traffic and transport during construction. The Construction Traffic Management Plan would include measures such as community engagement, implementation of traffic management and specified heavy good vehicle construction traffic routes and wheel cleaning facilities.

4.11.4 The operation of the Project would not create any notable increase in movements of vehicles, only movements associated with maintenance activities which are not considered to be significant.

4.11.5 For further information refer to Chapter 15: Traffic and Transport (Volume II) of the Preliminary Environmental Information Report.

## 4.12 Waste and Materials

4.12.1 The preliminary desk-based 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 Project, the potential risk to the construction supply chain is not significant.

4.12.2 The Project passes through and close to several mineral safeguarding areas. Therefore, the Project has the potential to sterilise these mineral sites by preventing future extraction of the mineral resource. A Mineral Resource Assessment will therefore be prepared to support the Environmental Statement and in order to fully assess the impacts of the Project on these natural assets.

4.12.3 The current land use in the area surrounding the Project generates minimal volumes of waste. Waste management facilities and materials recovery infrastructure is available throughout the Yorkshire and Humber region. As a result, there is strong potential to divert site arisings from landfill, and for their reuse and recycling. In order to manage the waste on site, a Site Waste Management Plan would be implemented, this would outline the framework for the management of wastes generated during the construction of the Project and where practicable identify materials that can be reused within the Project.

4.12.4 For further information refer to Chapter 16: Waste and Materials (Volume II) of the Preliminary Environmental Information Report.

## 4.13 Hydrology and Land Drainage

4.13.1 The preliminary desk-based data has revealed that the Project crosses 19 main rivers including the River Humber and there are a further three within 500 m of the Project. The majority of the waterbodies share similar quality characteristics. They are all failing with regard to chemical status and, except for two main rivers, have a moderate ecological status. The exceptions include Hatfield Waste Drain which has a poor ecological status and Sketter Beck/East Halton Beck which has an ecological status of bad.

4.13.2 The Project is partially located within a surface water Drinking Water Protected Area in the vicinity of Scawby and Brigg within 500 m of the Project. The remainder of the

Project is not located within a surface water Drinking Water Protected Area or surface water Drinking Water Safeguard Zone.

4.13.3 According to the Environment Agency Flood Map for Planning, the Project is partially located within large areas of Flood Zone 3[3] (high risk) and Flood Zone 2 (medium risk).

4.13.4 The preliminary assessment has identified that there would be no significant adverse effects during the construction, operation or decommissioning phases of the Project. However, mitigation measures to reduce any potential effects on sensitive receptors would be implemented through on-going design work (to avoid sensitive areas) and good site practice (including sediment and pollution control mechanisms), which would be recorded in a Construction Environmental Management Plan.

4.13.5 For further information refer to Chapter 17: Hydrology and Land Drainage (Volume II) of the Preliminary Environmental Information Report.

## 4.14 Major Accidents and Disasters

4.14.1 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.

4.14.2 A disaster is a naturally occurring phenomenon such as an extreme weather event (for example, a storm or flood) or ground-related hazard events (for example, landslide or earthquake) with the potential to cause an event or situation that meets the definition of a Major Accident as defined above.

4.14.3 The preliminary assessment has determined that the potential for a fire and/or explosion at an external, non-Project related Control of Major Accident Hazard site as significant. Mitigation for this potential significant effect would include an external Control of Major Accident Hazard Establishment site emergency plan to control/contain the initiating event to prevent/reduce the risk of spread to the nearby Project infrastructure and a failsafe emergency shutdown system on the carbon dioxide and hydrogen transmission system. With these mitigation measures in place, this potential significant effect would be managed to be as low as reasonably practicable.

4.14.4 Whilst deemed not significant, the remaining potential Major Accident and Disasters risks would be managed to be as low as reasonably practicable via mitigation actions such as 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.

4.14.5 For further information refer to Chapter 18: Major Accidents and Disasters (Volume II) of the Preliminary Environmental Information Report.

## 4.15 Greenhouse Gases

4.15.1 Greenhouse gas 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.

[3] 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

4.15.2 The Yorkshire and the Humber region is the UK's largest greenhouse contributor and was responsible for emitting 700.8 mega tonnes of carbon dioxide equivalent in 2020. The Humber Industrial Cluster alone contributes around 12.6 mega tonnes of carbon dioxide equivalent per annum.

4.15.3 It is predicted that a 54% reduction could be enabled by 2050 through the implementation of energy efficiency strategies such as blue-green infrastructure and focus on circular economy. This places the future baseline emissions for the Humber Industrial Cluster sector at 5.8 mega tonnes of carbon dioxide equivalent per annum per annum.

4.15.4 Greenhouse Gas emissions from the construction of the Project would be minimised by design optimisation and environmentally sensitive practices reflecting the Institute of Environmental Management and Assessment's Greenhouse Gas Management Hierarchy. During operation, emissions could be minimised by specifying long-lasting, high efficiency materials that require minimal maintenance and refurbishment, and using best practice in energy efficiency when carrying out maintenance and refurbishment works. Decommissioning emissions could be reduced by minimising the volume of waste being disposed of at landfill and maximising the potential for repurpose/reuse at the Project site. As a result of the nature of the Project and mitigation measures outlined prior, the preliminary assessment does not anticipate any likely significant effects.

4.15.5 For further information refer to Chapter 19: Greenhouse Gases (Volume II) of the Preliminary Environmental Information Report.

## 4.16 Assessment of Cumulative Effects

4.16.1 The Environmental Impact Assessment will assess the potential for significant combined and cumulative environmental effects as a result of the Humber Low Carbon Pipelines. 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 Project.
- Inter-Project Cumulative effects are the effects caused by the Project in combination with the effects caused by other developments in a similar area, on the same receptor.

### Intra-Project Combined Effects

4.16.2 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 Project. 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 Project.

4.16.3 Due to the on-going design development of the Project, a preliminary assessment of combined effects has not been undertaken for the Preliminary Environmental Information Report. However, the potential intra-project combined effects will be identified and reported within the Environmental Statement by reviewing the conclusions of the technical topics and their effects on common sensitive receptors.

## Inter-Project Cumulative Effects

4.16.4 The assessment of inter-project cumulative effects considers the change to existing baseline conditions at sensitive receptors as a result of both the Project and one or more 'Other Developments'. 'Other Developments' are likely to include other infrastructure projects under construction or under consideration by the local authorities within a certain distance from the Project.

4.16.5 The assessment will follow a four-stage process. The inter-project cumulative effects assessment for the Project 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 will be reviewed, and any common environmental impacts will be identified.

4.16.6 The cumulative effects assessment will be carried out during the environmental impact assessment and will be reported in the Environmental Statement.

4.16.7 For further information refer to Chapter 20: Assessment of Cumulative Effects (Volume II) of the Preliminary Environmental Information Report.

# 5. Have Your Say

5.1.1 This non-technical summary of the Preliminary Environmental Information Report forms part of the current statutory consultation being undertaken between 09:00 am Monday 31 October 2022 and 08.59 am Tuesday 29 November 2022, which also includes a series of community consultation events. Please share any ideas, local knowledge, feedback, questions or concerns that you may have. Consultation events will be held in person at various locations from 01 November to 12 November 2022, with two online events on 16 November and 22 November 2022. It should be noted that if the dates of the statutory consultation period (and any associated event) change, this will be advertised accordingly.

5.1.2 Further information on the consultation can be found on our webpage at nationalgrid.com/humberpipelines. All the consultation materials will be digitally available, including:

- This non-technical summary;
- The full Preliminary Environmental Information Report; and
- The Project Brochure.

5.1.3 You can also view copies of the brochure and additional materials at reference locations as detailed in the Statement of Community Consultation. Please contact our project team at HumberLowCarbon@nationalgrid.com to request an accessible format of the brochure.

5.1.4 You are able to respond using the following methods:

- Visit our website nationalgrid.com/humberpipelines and complete a digital feedback form. You can also find all copies of our consultation materials on our website;
- Complete the consultation response form available on request from the project team or at Consultation events (as listed in the consultation brochure) and return the form to FREEPOST HLCP NATIONAL GRID;
- Email your response to HumberLowCarbon@nationalgrid.com;
- Call us on Freephone 0800 860 6255; or
- Write to us at FREEPOST HLCP NATIONAL GRID.

5.1.5 All responses should be returned by 08.59 am on Tuesday 29 November 2022.

# 6. What are the next steps?

## 6.1 The next steps

6.1.1 Following consultation on the Preliminary Environmental Information Report, all consultation responses received will be reviewed and considered as part of the ongoing Environmental Impact Assessment and Project design processes, and ultimately the production of the final Environmental Statement to be submitted with the development consent order application.

6.1.2 Further survey and assessment work will be undertaken and will feed into the design of the Project. The assessments presented in the Preliminary Environmental Information Report will be revisited once the design of the Project has been finalised, and complete detailed design information and data is available.

6.1.3 The results of the further surveys and assessments will be presented as part of the Environmental Statement submitted alongside the development consent order application.

6.1.4 We expect to submit our application in early/mid 2023 and, provided consent is granted, construction work is expected to start in 2025. Once we submit our application, the Planning Inspectorate (acting on behalf of the Secretary of State) will examine the application and may hold some public hearings, before making a recommendation to the Secretary of State for Business, Energy and Industrial Strategy, who will decide on whether or not the Project will go ahead.

**Different formats**

Please let us know if you or anyone you know require consultation documents in different formats, such as alternative languages, Braille or large print.

**Contact us**

Email us at: **HumberLowCarbon@nationalgrid.com**
Call us on: **0800 860 6255**
Write to us using: **FREEPOST HLCP NATIONAL GRID**
Website: **nationalgrid.com/humberpipelines**

Oct. 2022. Camargue/JFD