



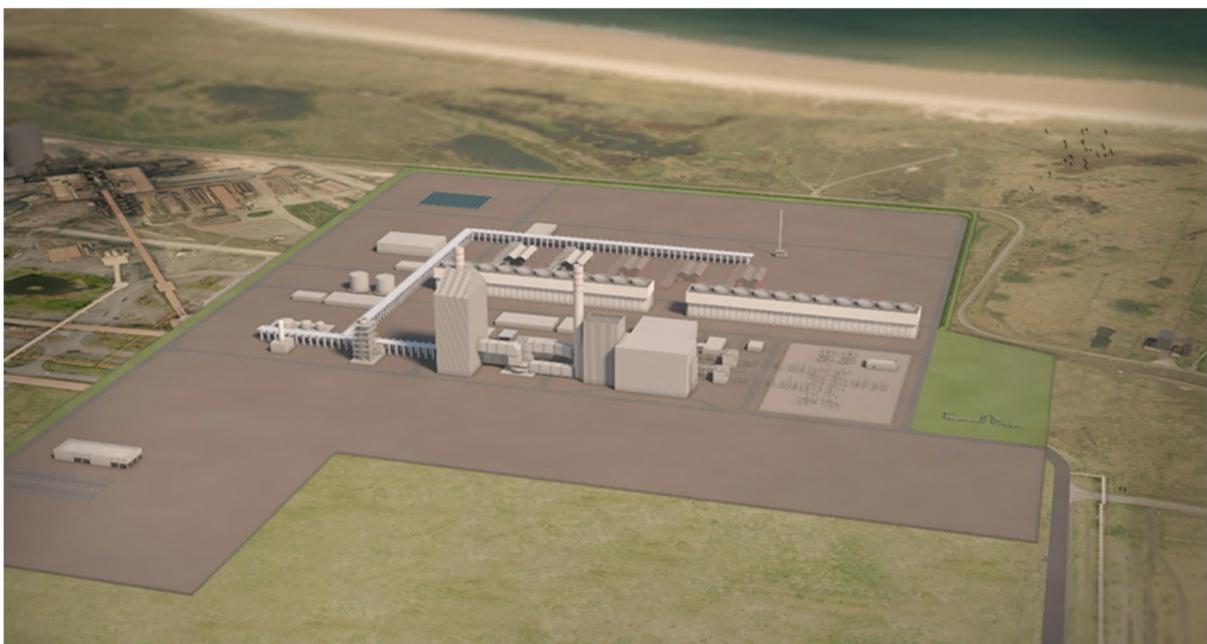
Net Zero Teesside – Environmental Statement

Planning Inspectorate Reference: EN010103

Document Ref. 6.1 ES Non-Technical Summary

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)

The Infrastructure Planning (Applications: Prescribed Forms and Procedure Regulations 2009 - Regulation 5(2)(a)



Prepared by: **AECOM**



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1. Non-Technical Summary

1.1 Introduction

- 1.1.1 This document presents a Non-Technical Summary (NTS) (Document Ref. 6.1) of the Environmental Statement (ES) that has been prepared to accompany the Development Consent Order (DCO) Application for the construction, operation and maintenance of the on-shore part of the wider Net Zero Teesside project (NZT) in Teesside. This part is called the Proposed Development.
- 1.1.2 NZT will be the UK's first commercial scale, full chain Carbon Capture, Usage and Storage (CCUS) project, and will initially capture up to 4 million tonnes of carbon dioxide (CO₂) emissions per annum, the equivalent to the annual energy use of over 1 million homes in the UK. The NZT project will therefore make a significant contribution toward the UK reaching its net zero greenhouse gas emissions target by 2050.
- 1.1.3 The Proposed Development (see Diagram NTS 1) comprises:
- a new gas-fired electricity generating station (power station) with post-combustion carbon capture plant with a gross electrical output of up to 860 megawatts (MWe);
 - gas, water and electricity connections (for the generating station);
 - a CO₂ pipeline network (a 'gathering network') for collecting CO₂ from a cluster of local industries on Teesside;
 - a CO₂ compressor station (for the compression of the CO₂); and
 - first part of a CO₂ export pipeline to transport the captured CO₂ off shore for permanent storage beneath the North Sea.
- 1.1.4 The Proposed Development to which this DCO application and supporting ES relates covers all works associated with the Project down to Mean Low Water Springs (MLWS), and (if required) the refurbishment or replacement of an existing effluent outfall below MLWS into the Tees Bay. The parts of the development below Mean High Water Springs also require consenting by a Marine Licence. This includes the initial section of CO₂ export pipeline as well as the effluent outfall.
- 1.1.5 The offshore elements of the NZT project (Diagram NTS 2), including the off-shore portion of the CO₂ Export Pipeline, the CO₂ store itself and CO₂ injection wells into the underground Endurance store (located approximately 145 km to the south-east of Teesside) and the associated off-shore infrastructure do not form part of the Proposed Development and will be consented separately.

Diagram NTS 1: The Proposed NZT Project

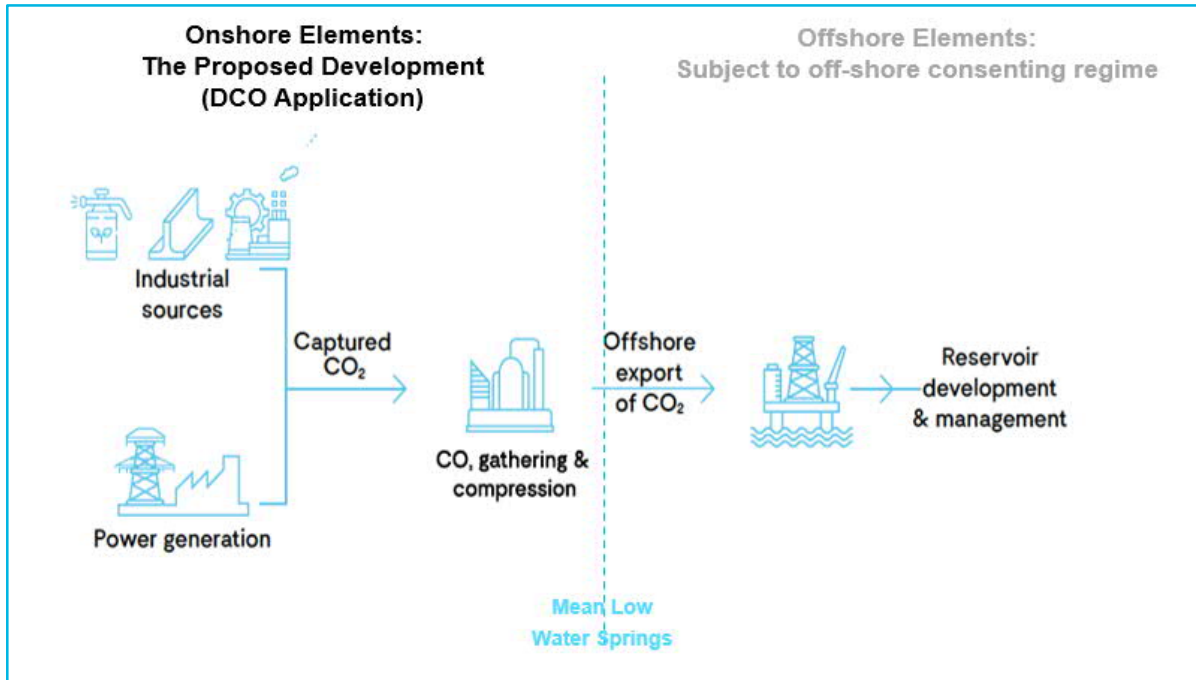


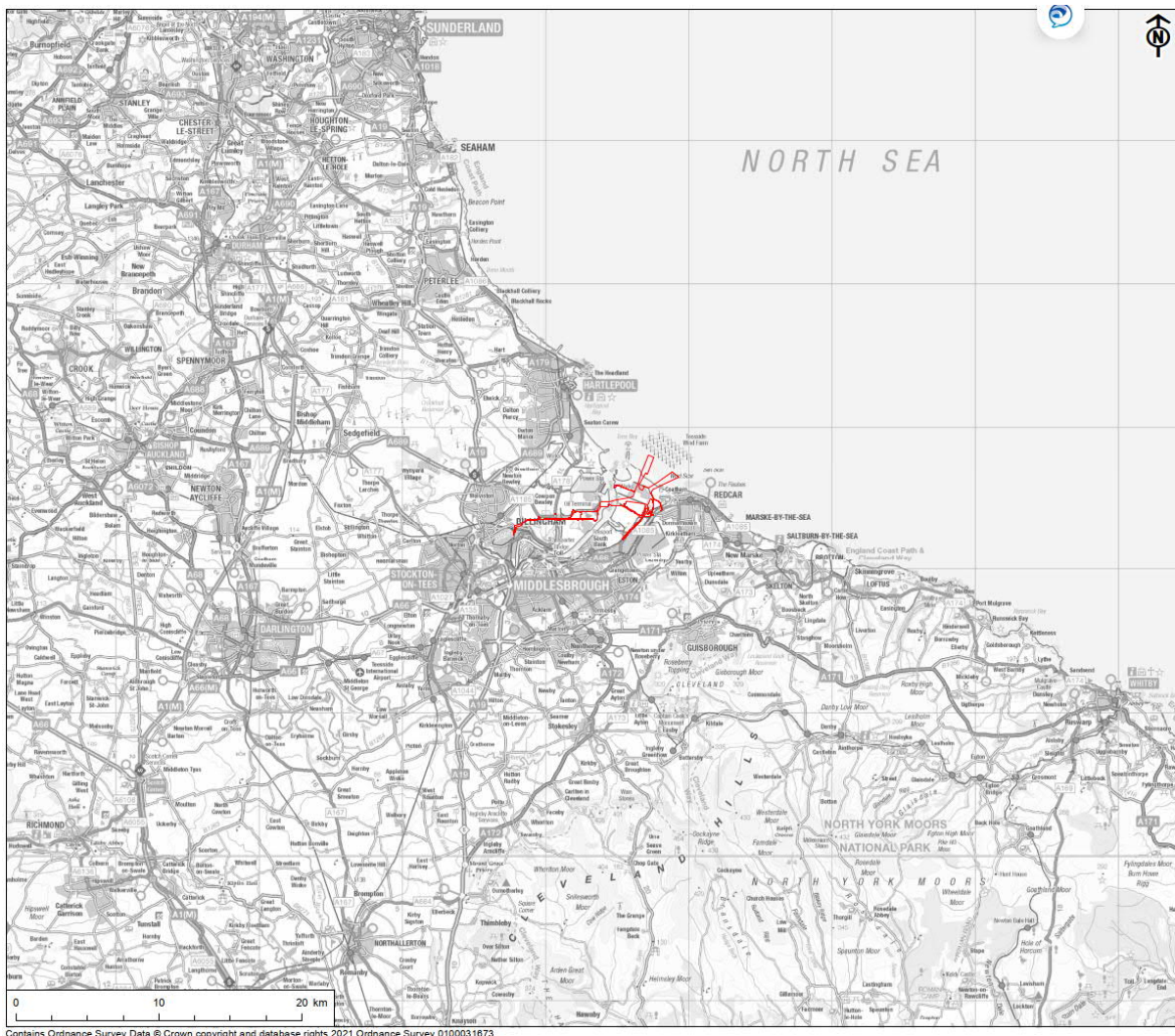
Diagram NTS 2: Offshore Elements of the NZT Project



1.1.6 Whilst the Proposed Development is designed for the future capture and storage of CO₂ from third-party industrial emitters on Teesside (including from hydrogen production), the capture of these emissions does not form part of the DCO application and is not considered in this ES. Third-party connections to the wider carbon capture network installed as part of this development will be the subject of separate consent applications.

- 1.1.7 The Proposed Development Site ('the Site') covers a wide area located within the administrative boundaries of Redcar and Cleveland Borough Council (RCBC) to the south of the River Tees (South Bank and Dormanstown Wards) and in Stockton-on-Tees Borough Council (STBC) to the north of the River Tees (Billingham South Ward). A large portion of the Site to the South of the Tees lies within the South Tees Development Corporation (STDC) masterplan site, known as Teesworks.
- 1.1.8 The Site boundary for the purposes of the DCO application, including land for the connection corridors and temporary land required during construction of the Proposed Development, has been refined through on-going studies and taking into account responses received through statutory and non-statutory consultation.
- 1.1.9 The Site Location is shown on Diagram NTS 3: Site Location Plan.

Diagram NTS 3: Site Location Plan



- 1.1.10 The purpose of this NTS is to describe the Proposed Development and provide a summary in non-technical language of the key findings of the ES.
- 1.1.11 The ES has been prepared to comply with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) ('the EIA

Regulations'). Environmental Impact Assessment (EIA) is a systematic process used to predict the adverse and beneficial effects of a proposed development. An Environmental Statement (ES) has been prepared and submitted with the DCO Application for the Proposed Development (Document References 6.2 to 6.4).

1.1.12 The ES presents:

- a description of the Proposed Development including information on the Site and the development design, size and other relevant features;
- baseline data gathered during the impact assessment process;
- information on the reasonable alternative sites, technologies and layouts that have been considered and the main reasons for the options chosen;
- an assessment of the likely significant environmental effects of the construction, operation (including maintenance) and eventual decommissioning of the Proposed Development; and
- measures that are proposed to avoid, prevent or reduce, or if possible, offset, such likely significant adverse effects.

1.1.13 Section 2 of this NTS summarises the assessment methodology. Technical details of the EIA process are provided within Chapter 2: Assessment Methodology (ES Volume I, Document Ref. 6.2).

1.1.14 Further information on the Proposed Development can be found in Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2) and on the project website: <https://www.netzeroteesside.co.uk/>.

1.2 The Applicants

1.2.1 Net Zero Teesside Power Limited ('NZN Power') and Net Zero Teesside North Sea Storage ('NZNS Storage') are together 'the Applicants' for the DCO Application.

1.2.2 NZN Power is a partnership between bp, Eni, Equinor and Total, with bp leading as operator. NZN Power will be responsible for NZN in so far as it relates to the construction, operation and eventual decommissioning of the power station together with its carbon capture plant.

1.2.3 NZNS Storage is a partnership between bp, Eni, Equinor, National Grid, Shell and Total with bp leading as operator, and will be responsible for the construction, operation and decommissioning of the equipment required for the high-pressure compression of CO₂ from the power station and local businesses/industries, as well as the CO₂ gathering network and the onshore section of the CO₂ export pipeline – these are all within the scope of the DCO Application.

1.2.4 NZNS Storage will also be responsible for the offshore elements of NZN, comprising the offshore section of the CO₂ transport/export pipeline to a suitable offshore geological CO₂ storage site under the North Sea, CO₂ injection wells and associated infrastructure. The offshore elements of NZN (with the exception of the gas and CO₂ pipeline crossings of the River Tees

and the water outfall from the power station) are not included in the DCO Application and will be subject to separate consent applications.

1.3 The Development Consent Order

- 1.3.1 A DCO is required for the Proposed Development as it falls within the definition and thresholds for a 'Nationally Significant Infrastructure Project' (an 'NSIP'). The Applicant has therefore submitted an application to the Secretary of State (for Business, Energy and Industrial Strategy) under Section 37 of the Planning Act 2008 (the Planning Act), seeking a DCO for the Proposed Development.
- 1.3.2 Subject to it being granted by the SoS the DCO provides the necessary authorisations and consents for the construction, operation and maintenance of the Proposed Development.

2. Assessment Methodology

2.1 EIA Methodology

- 2.1.1 The assessment presented in the ES follows a standard Environmental Impact Assessment (EIA) methodology, which is summarised below.
- 2.1.2 The objective of the EIA process is to anticipate the changes (or ‘impacts’) that may occur to the environment as a result of the Proposed Development, such as increases in traffic and changes to air quality or noise. The changes are compared to the environmental conditions that would have occurred without the Proposed Development (defined as ‘the baseline’). The EIA process identifies potentially sensitive ‘receptors’ that may be affected by these changes (e.g. people living near the development, local flora and fauna) and defines the extent to which these receptors may be affected by the predicted changes (i.e. whether or not the receptors are likely to experience a ‘significant effect’).
- 2.1.3 Where possible, the EIA uses standard methodologies, based on legislation, defined standards and accepted industry criteria. This is set out in detail in each technical chapter of the ES (Volume I, Document Ref. 6.2).
- 2.1.4 Effects on the receptors can be adverse (negative), neutral (neither negative nor positive) or beneficial (positive). They can also be temporary (e.g. noise during construction) or permanent (e.g. the views of the finished buildings).
- 2.1.5 For the purpose of the ES, adverse and beneficial effects are described as ‘significant’ or ‘not significant’. Where the EIA predicts a significant adverse effect on one or more receptors, mitigation measures are identified where possible to avoid or minimise the effect, or to reduce the likelihood of the effect happening. The use of such mitigation will be secured through Requirements included within the draft DCO or through other legislation and consenting regimes. Details of the EIA Assessment Methodology are provided within Chapter 2: Assessment Methodology (ES Volume I, Document Ref. 6.2).

2.2 EIA Scoping (Selection of Environmental Topics to be assessed)

- 2.2.1 EIA Scoping is a process that is designed to identify relevant topics that should be included in the EIA and reported in the Environmental Statement (ES). An EIA Scoping Report and a request for an EIA Scoping Opinion under Regulation 10 of the EIA Regulations was submitted to the Planning Inspectorate (PINS) and relevant consultees on 20th February 2019 to allow them to comment on the extent and approach to the environmental assessments to be undertaken.

- 2.2.2 A Scoping Opinion was received from PINS on 2nd April 2019 and is presented within Appendix 1B in ES Volume III (Documents Ref. 6.2). The ES is based on the Scoping Opinion and therefore includes assessments of the following environmental topics:
- air quality;
 - surface water environment (hydrology and water resources including flood risk);
 - geology, hydrogeology and contaminated land;
 - noise and vibration;
 - terrestrial ecology and nature conservation;
 - aquatic ecology;
 - marine ecology and nature conservation;
 - ornithology;
 - traffic and transport;
 - landscape and visual amenity;
 - archaeology and cultural heritage;
 - marine heritage;
 - socio-economics and tourism;
 - climate change;
 - major accidents and natural disasters;
 - population and human health; and
 - cumulative and combined effects.
- 2.2.3 Following the completion of an EIA Scoping Report and publication of PINS' Scoping Opinion, the environmental information for a DCO is reported in two stages:
- a PEI Report, which is prepared to inform consultation with the public and other stakeholders about the Proposed Development, based on the preliminary environmental information available at the time of consultation; and
 - an ES, which is then prepared to accompany the DCO Application and includes the EIA of the Proposed Development, taking account of any design evolution that has taken place as well as feedback received during consultation.
- 2.2.4 The PEI Report for the NZT Project was prepared to meet the requirements of Regulation 12(2) of the EIA Regulations and was published in June 2020. In order to enable consultees to understand the likely environmental effects of the Proposed Development, the PEI Report presented preliminary findings of the environmental assessments undertaken up to that point in time. This allowed consultees the opportunity to provide informed comments on the

Proposed Development, the assessment process and preliminary findings, through a consultation process prior to the finalisation of the ES.

- 2.2.5 Regulation 14(2) describes the requirements of an ES, which includes a description of the Proposed Development, its likely environmental effects, measures to avoid, prevent, reduce and offset likely significant adverse effects, a description of alternatives and reasons for the options chosen, and a nontechnical summary of the information. This document is the non-technical summary of the ES submitted with the DCO application.

2.3 Consultation

- 2.3.1 Consultation is integral to the preparation of DCO applications and to the EIA process. The Planning Act requires applicants for development consent to carry out pre-application consultation on their proposals. This includes consultation on the PEI Report, as described above.
- 2.3.2 Consultation with key stakeholders has been ongoing throughout the EIA process and on publication of the PEI Report, and comments have been addressed in the ES where applicable.
- 2.3.3 All the consultation responses received have been considered in the preparation of the Application and supporting documentation, as set out in the Consultation Report (Document Ref. 5.1) that also accompanies the DCO application.

2.4 ES Report Structure

- 2.4.1 The format of the ES is as follows:
- 2.4.2 Volume I of the ES (Document Ref.6.2) is structured into chapters, as follows:
- Chapters 1 and 2 – an introduction to the ES and EIA assessment methodology approach;
 - Chapters 3 to 6 – a description of the Proposed Development including information on the surrounding area and on construction timescales and alternatives;
 - Chapter 7 – a summary of relevant legislation and policy;
 - Chapters 8 to 23 –assessments of the likely significant effects of the Proposed Development in relation to the environmental topics considered in the EIA;
 - Chapter 24 – an assessment of the potential for cumulative and combined effects to occur as a result of the Proposed Development; and
 - Chapter 25 – a summary of the potential significant environmental effects identified.
- 2.4.3 Volumes II (Document Ref. 6.3) and III (Document Ref. 6.4) of the ES contain the figures and technical appendices respectively that accompany each chapter of Volume I.
- 2.4.4 The ES is accompanied by this NTS (Document Ref. 6.1).

3. Description of the Existing Environment

3.1 The Site Details

- 3.1.1 All of the land included within the DCO boundary (or 'Order Limits') is referred to as 'the Site' for the purposes of the ES and this NTS. The Site has an area of 462.0 ha and contains all of the land required for the Proposed Development.
- 3.1.2 Also within the Site is the area referred to as the Power, Capture and Compressor site (the 'PCC Site') within which the main built development will take place and which will be the location of the power station together with the associated carbon capture and compression facilities.
- 3.1.3 The Site is divided into the following areas (described in more detail in Chapter 3: Description of the Existing Environment (ES Volume I, Document Ref. 6.2). Further detail on the different areas which make up the Proposed Development is provided in this Section 4 of the NTS and Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2).
- The Site boundary and the PCC Site (refer to Diagram NTS 4);
 - CO₂ Export Pipeline (refer to Diagram NTS 5);
 - Natural Gas Connection (refer to Diagram NTS 6);
 - Electrical Connection (refer to Diagram NTS 7);
 - Water Connections (refer to Diagram NTS 8); and
 - CO₂ Gathering Network (refer to Diagram NTS 9).
- 3.1.4 The PCC Site has an area of approximately 42.5 ha and will be located on the existing Teesworks site. This is land which was formerly part of the former Redcar Steelworks site and is located on the south bank of the River Tees, to the south-east of the Redcar Bulk Terminal, in the South Bank Ward of RCBC
- 3.1.5 The former Redcar Steelworks site comprises approximately 225 ha of land previously used for iron and steel manufacture developed on land reclaimed from the Tees Estuary over the late 19th and 20th centuries. The area in which the PCC will be developed currently contains some redundant large-scale plant and buildings associated with the steelworks although these will be removed prior to construction of the Proposed Development.
- 3.1.6 The former Redcar Steelworks site also contains parts of parts of the CO₂ Export Pipeline Corridor, parts of the CO₂ Gathering Network Corridor, parts of the Natural Gas Pipeline Corridor, and parts of the Water Supply and Discharge Connection Corridors.
- 3.1.7 Both the Water Discharge Corridor and the CO₂ Export Pipeline cross Coatham Dunes and Coatham Sands before continuing seaward. The Water Supply Corridor follows the route of the former Northumbrian Water feed to the former Redcar Steelworks site.

- 3.1.8 The PCC Site is remote from residential receptors, although there are areas of public/private amenity close to its northern and eastern boundary. The nearest residential settlements are the town of Redcar (approximately 1.8 km east of the PCC Site) including the suburb of Dormanstown (approximately 1.4 km to the south east of the PCC Site) and the village of Warrenby (approximately 0.7 km to the south-east of the PCC Site), which consists of the Warrenby Industrial Estate and a single residential property (Marsh House Farm).
- 3.1.9 The other Connections Corridors outside the former Redcar Steelworks site are located within and around land developed for use by the steel industry from the late 19th century and by the chemical industry after the second world war, including land at Billingham and Seal Sands. The majority of this land has also been reclaimed from the Tees Estuary in the past.
- 3.1.10 The other connections corridors pass through vacant land or existing utilities corridors to the south and north of the River Tees.

3.2 The Surrounding Area

- 3.2.1 The area surrounding the site is described in more detail in Chapter 3: Description of the Existing Environment (ES Volume I, Document Ref. 6.2). The area surrounding the Site is predominantly characterised by industrial land uses.
- 3.2.2 To the north of the Site lie the coastal areas of South Gare and Coatham Sands. To the south and west lie Northumbrian Water's Bran Sands wastewater treatment plant and operational land of PD Ports Teesport. To the south-east is the Wilton International chemical complex.
- 3.2.3 The Site extends north and west across the River Tees through Seal Sands and on towards Billingham. On the north bank of the River Tees industrial complexes are present at Seal Sands and Billingham, with both industrial and residential development at Port Clarence.
- 3.2.4 Access routes to the Site will be via existing access roads from the A1085 Trunk Road between Redcar and the A1053 Tees Dock Road, north of Grangetown and approximately 4 km south of the PCC Site. From here, the A19 will be accessed from either the A66, passing north of Middlesbrough, or the A174, passing to the south. Traffic accessing parts of the Site located to the north of the River Tees will travel from the A19 via the A1046, A178 and A1185.

3.3 Potential Sensitive Receptors

- 3.3.1 A number of environmental receptors have been identified within and outside the boundary of the Site and are described in more detail in Chapter 3: Description of the Existing Environment (ES Volume I, Document Ref. 6.2). Distances are provided as the shortest distance between the receptor and the closest point of the boundary of the Site and/or the PCC Site.
- 3.3.2 Key receptors for each topic area have been identified as part of the assessment process and details are included in the relevant technical

chapters (Chapters 8 to 24, ES Volume I, Document Ref. 6.2). A summary is also provided below.

Residential Receptors

- 3.3.3 There are no residential receptors within 500 m of the PCC Site. The closest residential properties (individual receptors) to the PCC Site are those at Marsh House Farm in Warrenby 650 m to the east and on Broadway West in Dormanstown, approximately 1.4 km to the south-east. There no residential receptors within the wider Site boundary.

Sensitive Environmental Receptors

- 3.3.4 There are no statutory designated ecological sites within the PCC Site. Three statutory designated ecological sites are located immediately north of the PCC Site and which are also crossed by the Site boundary. These are:
- Teesmouth and Cleveland Coast Special Protection Area (SPA);
 - Teesmouth and Cleveland Coast Ramsar site; and
 - Teesmouth and Cleveland Coast Site of Special Scientific Interest (SSSI).
- 3.3.5 The SPA/Ramsar sites include a range coastal habitats (sand and mud-flats, rocky shore, saltmarsh, freshwater marsh and sand dunes) on and around the Tees Estuary and are designated for internationally important numbers of marine and shore birds including breeding and wintering waterfowl. The SPA/Ramsar site was recently extended to include Coatham Dunes. The SSSI is nationally important for sand dune and salt marsh habitats, breeding harbour seals and a range of bird species.

Public Rights of Way and Highways

- 3.3.6 There are no adopted highways within the PCC Site. The Site extends across a number of transport routes (highways and railways). These include (but are not limited to):
- A178;
 - A66;
 - A1085;
 - A1053;
 - A1046;
 - A1185;
 - B1275;
 - A1058;
 - A1056;
 - A1185;
 - B1275;
 - South Gare Road;
 - Tees Valley railway line; and
 - Stockton to Hartlepool railway line.

- 3.3.7 The PCC Site is not crossed by any Public Rights of Way (PRoW). The nearest PRoW to the PCC Site are:
- Bridleway 116/32/1 – the nearest point of which is approximately 630 m east of the PCC Site; and
 - Footpaths 116/31/1 and 116/31/2 – approximately 1.65 km south of the PCC Site.
- 3.3.8 A number of PRoW cross the Site away from the PCC Site, namely:
- Footpath 116/31/1 at Dabholm Gut;
 - Footpath 116/31/2 at Dabholm Gut
 - Bridleway 116/9/1 to the south of Bran Sands wastewater treatment plant; and
 - Bridleway 116/9/2 to the south of Bran Sands wastewater treatment plant.
- 3.3.9 Two long-distance footpaths cross the Site, namely the England Coast Path and the Teesdale Way which run through the Site to the north, east and south of the PCC Site. The Teesdale way crosses the routes of the Water Discharge Corridor and the CO₂ Export Pipeline Corridor. The England Coast Path crosses the CO₂ Gathering Network Corridor in Saltholme.

Air Quality

- 3.3.10 There are no Air Quality Management Areas (AQMAs) within the Site boundary as no AQMAs have been declared in either of the administrative areas of RCBC or STBC.

Geology and Hydrogeology

- 3.3.11 Man-made Ground is widespread across the former Redcar Steelworks site. This Made Ground is associated with the reclamation of land from the Tees estuary using waste materials (including slag) and the long historical industrial use of the Site and surrounding area.
- 3.3.12 The Site is underlain by superficial deposits, including but not limited to peat, beach and tidal flat deposits and glacial till.
- 3.3.13 The bedrock geology underlying the Site includes:
- Sherwood Sandstone Group (Triassic) in the north and west;
 - Mercia Mudstone Group (Triassic) in the centre (underlain by the Sherwood Sandstone Group);
 - Penarth Group (Triassic), which occurs as a thin bed between the Mercia Mudstone Group and the overlying Redcar Mudstone Formation; and
 - Redcar Mudstone Formation (Jurassic) in the south and east (underlain by the Mercia Mudstone Group, Penarth Group and Sherwood Sandstone Group).
- 3.3.14 The Sherwood sandstone and Mercia Mudstone are classified by the Environment Agency as Principal Aquifer and Secondary Aquifer respectively.

- 3.3.15 There are no Groundwater Dependent Terrestrial Ecosystems or Source Protection Zones that can potentially be impacted by the Proposed Development.

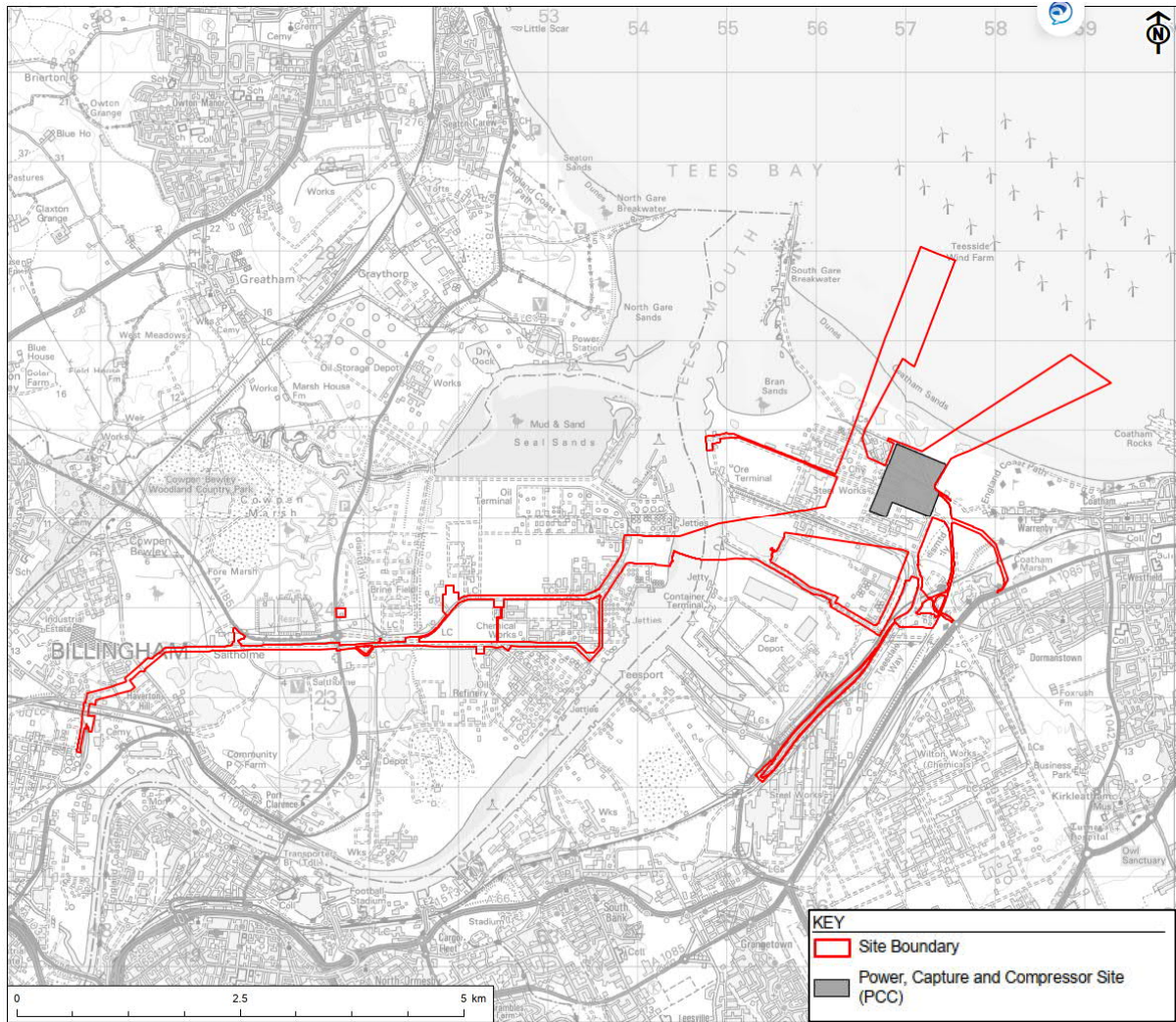
Hydrology and Flood Risk

- 3.3.16 The PCC Site is located in Flood Zone 1 (low risk). There are areas within the wider Site Boundary that are within Flood Zone 1, Flood Zone 2 (medium risk) and Flood Zone 3 (high risk). Some of the land in Flood Zone 3 benefits from flood defences.
- 3.3.17 The nearest designated watercourse to the PCC Site is the River Tees, located approximately 1.6 km to the west (at its closest point). The Proposed Development includes proposed pipeline crossings under the River Tees.
- 3.3.18 The Dabholm Gut flows to the River Tees approximately 0.8 km south of the PCC Site. The Dabholm Gut is tidal and receives water from The Fleet, The Mill Race and Dabholm Beck.
- 3.3.19 The North Sea is approximately 400 m north of the PCC Site and the Site Boundary extends into the North Sea at Coatham Sands.
- 3.3.20 The Site Boundary crosses a number of minor surface water courses and there are other water bodies including localised drains, pools/surface water bodies and areas of marshy ground within the Site.

Cultural Heritage Receptors

- 3.3.21 There are no designated heritage assets within the Site.
- 3.3.22 There is one Scheduled Monument located within 5 km of the PCC Site; a World War I early warning acoustic mirror located approximately 4.7 km east of the PCC Site. There are 25 Scheduled Monuments within 5 km of the Site boundary.
- 3.3.23 There are at least 80 listed buildings within 3 km of the PCC Site, 5 of which are Grade I and 9 of which are Grade II*. There is a cluster of 23 listed buildings at Kirkleatham, five of which are Grade I and six of which are Grade II*.
- 3.3.24 There are a further 23 listed buildings in the vicinity of Lazenby, Wilton and Lackenby, two of which are Grade II*. There is a further Grade II* listed building located approximately 1 km south of the proposed Site Boundary at Billingham and one at South Bank located approximately 1.4 km west of the proposed Site Boundary.
- 3.3.25 There are Conservation Areas at Wilton, Kirkleatham and Yearby, all located more than 2.5 km to the south-east of the Site.
- 3.3.26 Albert Park is a Registered Park and Garden which is located approximately 3.4 km southeast of the Site boundary in Middlesbrough

Diagram NTS 4: Site Boundary and PCC Site



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Diagram NTS 5: CO2 Export Pipeline

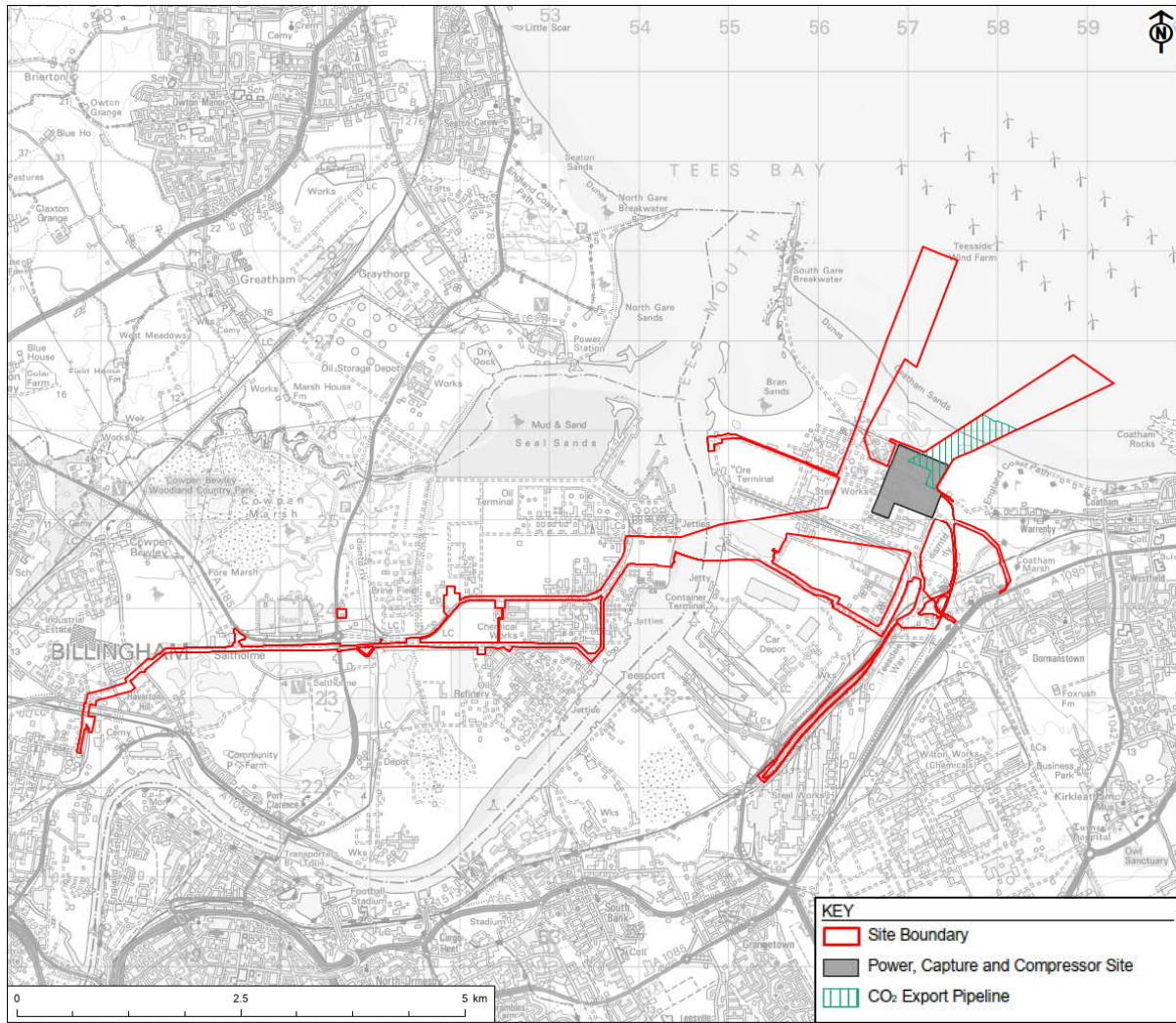


Diagram NTS 6: Natural Gas Connection

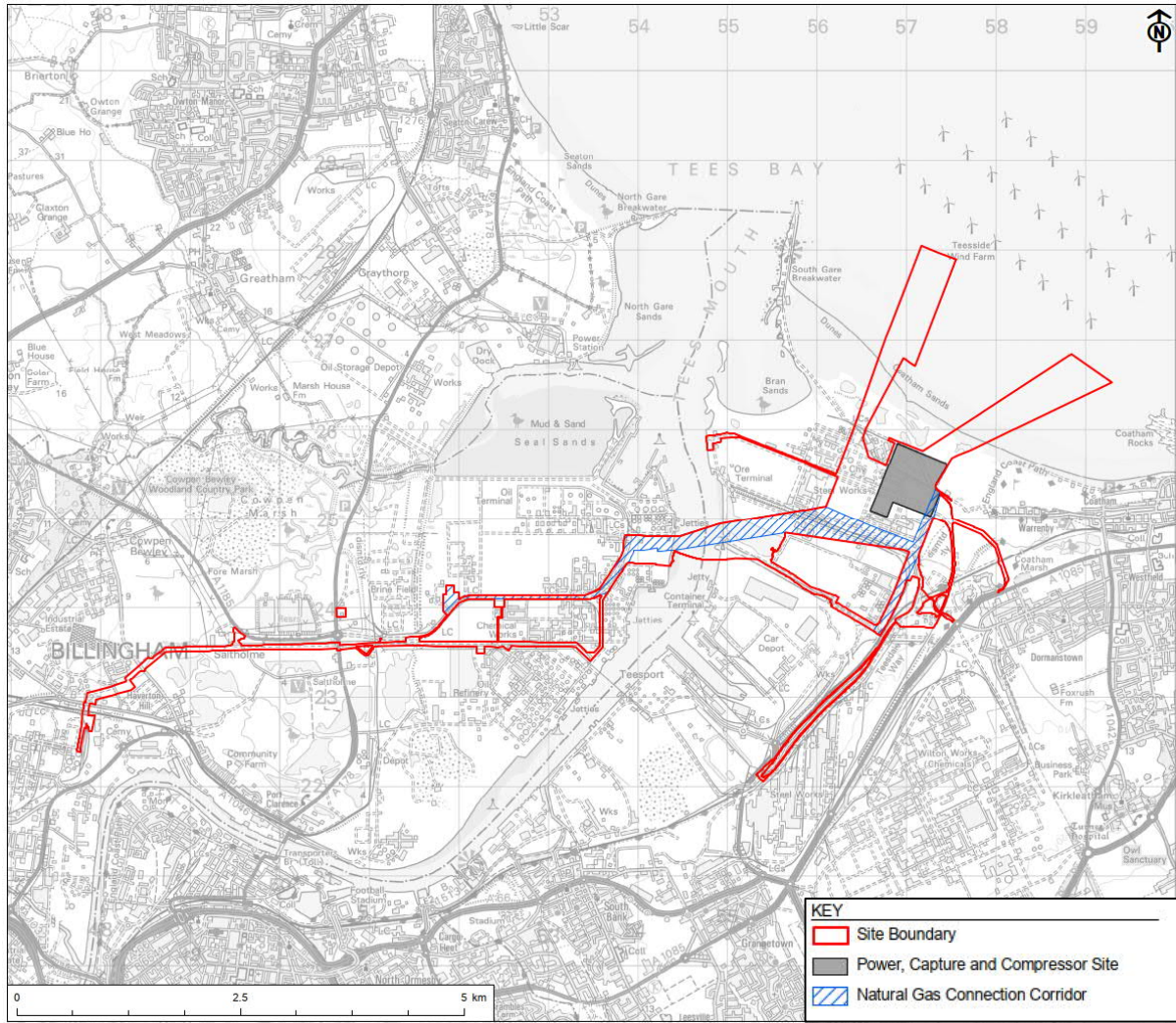


Diagram NTS 7: Electrical Connection

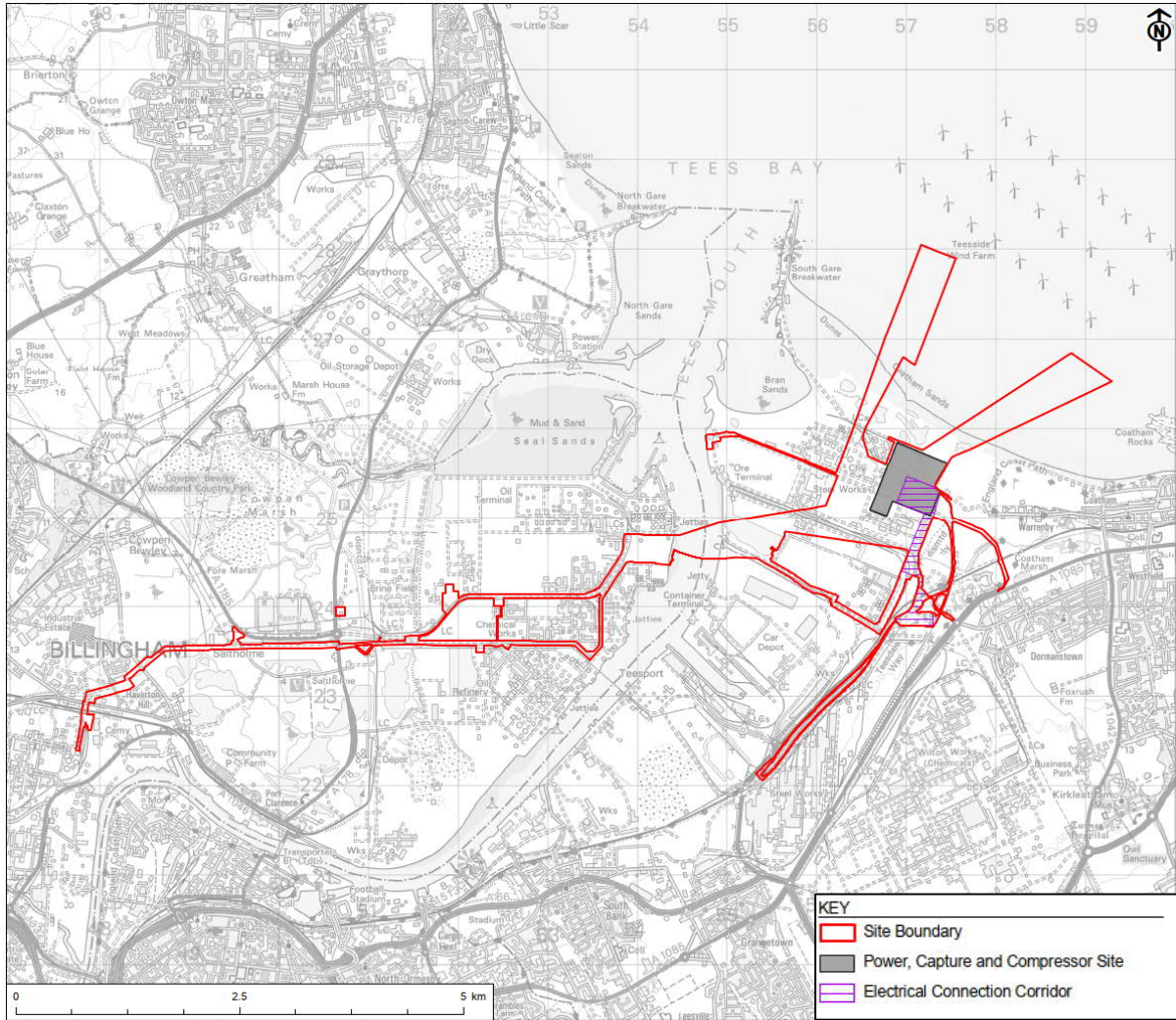


Diagram NTS 8: Water Connections

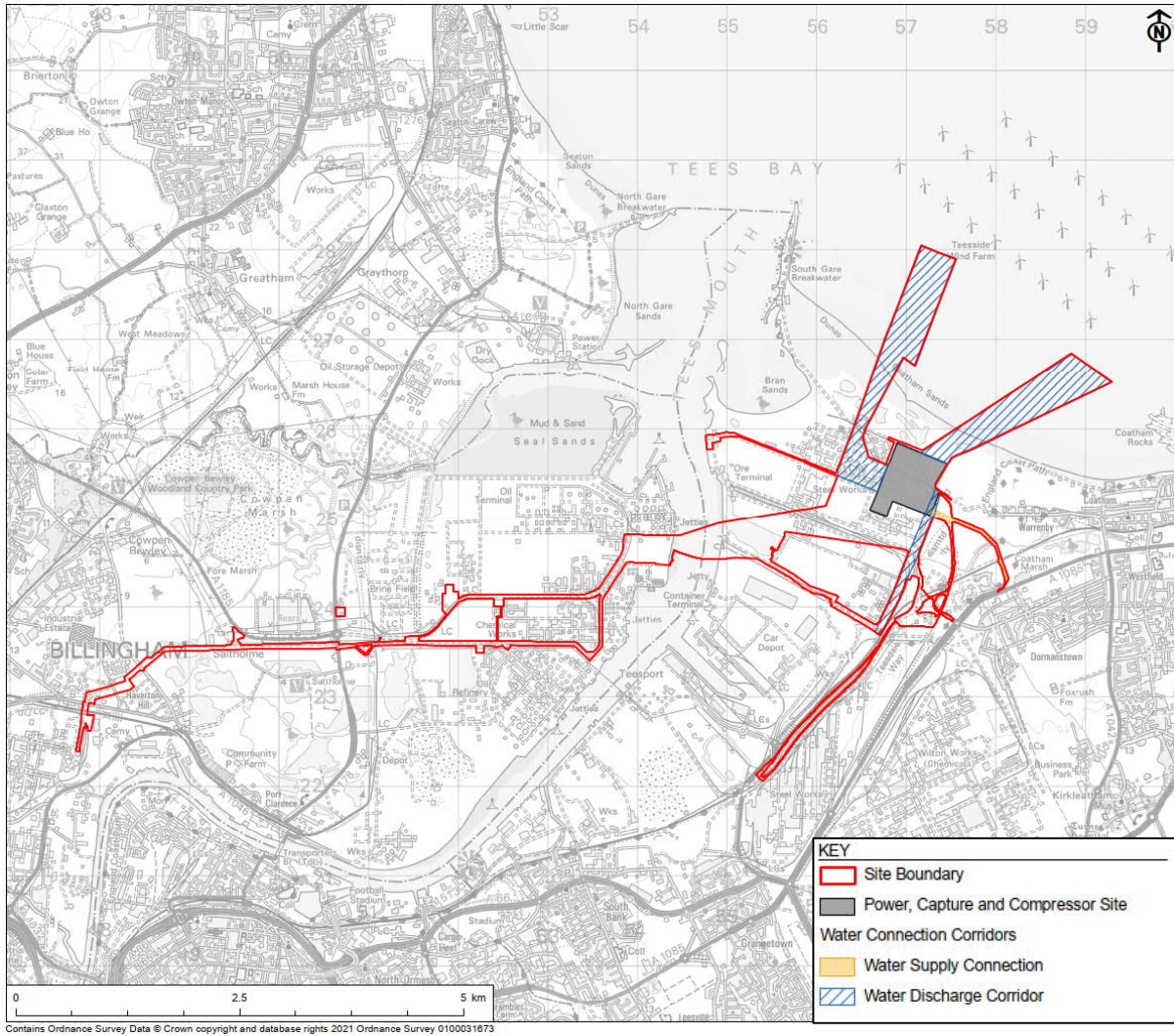
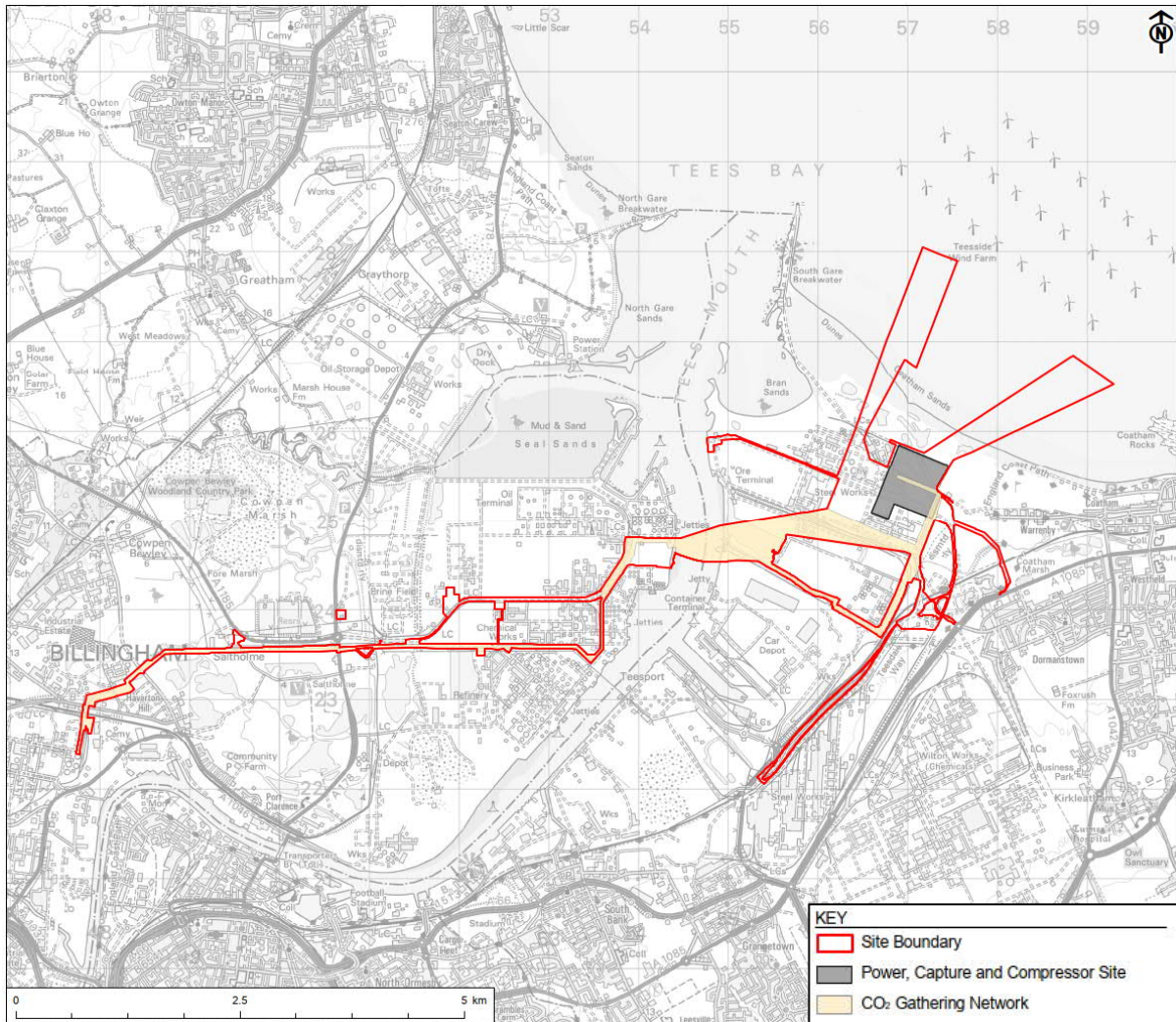


Diagram NTS 9: CO₂ Gathering Network

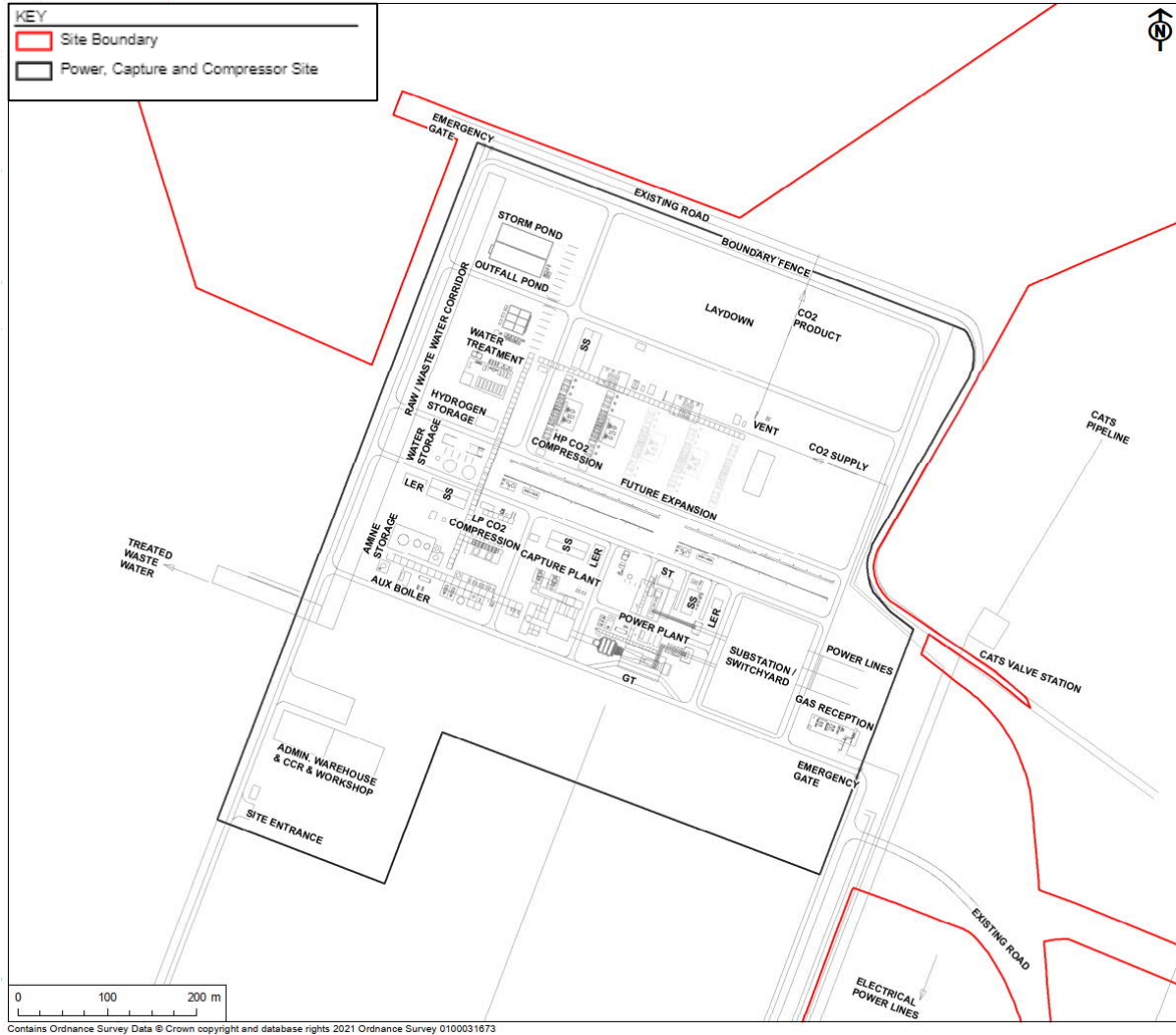


4. The Proposed Development

- 4.1.1 This section of the NTS provides a summary of the Proposed Development
- 4.1.2 The Proposed Development comprises the construction, operation, maintenance and eventual decommissioning of a CCUS project. It includes a Low-Carbon Power Station with a gross output of up to 860 MWe together with equipment required for the capture and compression of CO₂ emissions from the generating station and the installation of a wider industrial CO₂ Gathering Network on Teesside. The Proposed Development is described in detail in Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2).
- 4.1.3 The Works Plans (Document Ref. 4.4) define the areas (referred to as 'Work Nos.')
- within which each element of the Proposed Development will be located. In summary the Proposed Development comprises:
- A new build low carbon gas-fired power station consisting of a single CCGT train with integrated carbon capture unit, low pressure CO₂ compression and associated utilities and buildings on the PCC Site (**Low-Carbon Electricity Generating Station, Work No. 1**);
 - Natural gas pipeline to supply the power station (**Natural Gas Connection, Work No. 2A**) and (**Above Ground Installation, Work No. 2B**);
 - Electrical power export lines from the Low-Carbon Electricity Generating Station to the national grid system (**Electrical Connection, Work No. 3**);
 - Water Connections including:
 - a connection corridor to public utility raw water supply infrastructure, for the provision of water for the Proposed Development (**Water Supply Connection, Work No. 4**);
 - an existing or replacement outfall and associated pipework for the discharge of treated effluent and surface water to Tees Bay (including a potential pipeline connection for transportation of process water to Bran Sands Waste Water Treatment Plant and return for discharge) (**Water Discharge Connection, Work No. 5**);
 - CO₂ Gathering Network connecting various industrial installations across the Tees Valley (**CO₂ Gathering Network, Work No. 6**);
 - High Pressure CO₂ Compression facilities (**HP Compression Station, Work No. 7**) - on the PCC Site;
 - High pressure CO₂ export pipeline (**CO₂ Export Pipeline, Work No. 8**);
 - Temporary Construction and Laydown Areas (**Laydown Areas, Work No. 9**); and
 - Access and Highway Improvements (**Access and Highways Improvements, Work No. 10**).
- 4.1.4 The carbon capture plant will be designed to capture up to 95% of the CO₂ emitted from the power station, likely to be through the use of an amine-based solvent. This captured CO₂ will be compressed for transport to off-shore storage.

4.1.5 The Site Boundary and PCC Site, CO₂ Export Pipeline, CO₂ Gathering Network and the other Connections are shown in Diagrams NTS 4 to NTS 9 above. An indicative layout for the PCC Site is shown on Diagram NTS 10 below.

Diagram NTS 10: Indicative PCC Site Layout



5. Construction Programme and Management

5.1 Construction Programme

- 5.1.1 The construction programme is currently anticipated to commence shortly after the Development Consent Order (DCO) is granted (projected to be in or after the final quarter of 2022) and after a final investment decision is made to proceed with the Project.
- 5.1.2 The construction phase is expected to last approximately 4 years, however detailed phasing will be the responsibility of the appointed Contractors.
- 5.1.3 Table 5-1 presents the Indicative Construction Programme which has been used to inform the EIA.
- 5.1.4 Each environmental assessment topic within the ES identifies and assesses the reasonable 'worst case' construction scenario for that topic, where relevant.

Table 5-1: Indicative Construction Programme¹

	2022				2023				2024				2025				2026			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Enabling works																				
Site establishment																				
Preparation of site roads to allow deliveries from Redcar Bulk Terminal to the PCC site																				
Tees and Dunes/Foreshore Crossings for CO ₂ export pipeline and potentially the outfall																				
PCC Construction																				
Electrical Connection																				
Gas Connection																				
CO ₂ Gathering Network																				
Commissioning																				

¹ This programme excludes demolition and remedial works undertaken by Teesworks but which have been assessed in the ES

5.2 Construction Activities

- 5.2.1 Before the Applicant takes possession of the site, preliminary works will be required. The site preparation and remedial works at the PCC Site are expected to be completed by Teesworks' demolition and civils contractor to create a suitable development platform for the Proposed Development.
- 5.2.2 These works will include the following activities which have been assessed as part of the EIA:
- demolition of existing structures within the boundary of the PCC Site and laydown areas within the Teesworks site: principally the former raw materials handling facility, sinter plant and conveyor systems;
 - turnover of the made ground to remove unsuitable/contaminated materials including removal and crushing of derelict underground structures and obstructions, as required;
 - targeted removal of additional underground structures and remediation as requested by the Applicants; and
 - placement of suitable material to form appropriate platform levels for development.
- 5.2.3 Construction activities for the Proposed Development itself will include:
- establishment of construction laydown areas (e.g. site offices, storage areas, security fencing and gates);
 - earthworks to prepare the Site;
 - construction of foundations, which is likely to require the piling of key structures;
 - erection of buildings and structures and installation of plant and equipment;
 - installation of utilities and utility connections (electricity, natural gas and water);
 - construction of the CO₂ Gathering Network and CO₂ Export Pipeline; and
 - commissioning (testing) of the plant prior to operation.
- 5.2.4 The Applicants would appoint contractors to undertake the construction phase of the Proposed Development. The Applicants would retain overall responsibility for the project and would ensure that the works would be undertaken in accordance with legal requirements.
- 5.2.5 A detailed Construction Environmental Management Plan (CEMP) will be prepared prior to construction. The submission, approval and implementation of this will be secured by a requirement of the draft DCO. A Framework CEMP (Appendix 5A in ES Volume III, Document Ref. 6.4) has been prepared and is submitted as part of the ES to support the DCO Application. The Framework CEMP sets out the key measures to be employed during construction to control and minimise the impacts on the environment.

- 5.2.6 Full details of the construction phase is outlined in Chapter 5: Construction and Programme Management (ES Volume I, Document Ref. 6.2).

6. Alternatives and Design Evolution

- 6.1.1 The EIA Regulations state that an ES should include a description of reasonable and relevant alternatives studied by an applicant and the main reasons for selecting the chosen development, taking into account the environmental effects.
- 6.1.2 Chapter 6: Alternatives and Design Evolution (ES Volume I, Document Ref. 6.2) provides this information in respect of the Proposed Development. In summary, alternatives have been considered during the evolution of the Proposed Development including:
- alternative technologies;
 - alternative sites/ locations;
 - alternative locations within the Teesworks site;
 - alternative connection routing and corridors; and
 - alternative layouts and design options within the Site (including changes to the Site boundary).
- 6.1.3 The environmental effects of these alternatives has been compared to inform the Proposed Development layout and design.
- 6.1.4 The Proposed Development includes an appropriate degree of flexibility in the dimensions of buildings and structures to allow for the selection of the preferred technology and contractors.
- 6.1.5 In order to ensure a robust assessment, a maximum built ‘envelope’ (also referred to as the ‘Rochdale envelope’) has been defined to accommodate this necessary flexibility and to enable the EIA to consider the ‘worst case’. For example, the landscape and visual impact assessment has assessed the largest massing of buildings that could be required.
- 6.1.6 It is considered that the choice of technology, the choice of fuel for the power station and the inclusion of the associated connections and extent of the CO₂ gathering network are appropriate based on the consideration of alternatives that has been undertaken as part of the EIA and based on the purpose of the Proposed Development, which is to develop a First Of Kind (FOAK) carbon capture cluster for the collection and disposal of carbon dioxide emissions from a power station and industrial sources.
- 6.1.7 The Proposed Development design and layout (including the routeing of the connections) have continued to evolve following consultation and also consideration of access points, site layout, equipment sizing and capacity, land ownership, interaction with other developments and the phasing of construction. Site Boundary changes, biodiversity mitigation and enhancement proposals, water connection options, and environmental effects of each option have been appraised alongside technical and commercial considerations.
- 6.1.8 The Teesworks site is deemed the most appropriate site for the PCC, given it comprises previously developed land suitable for redevelopment, that is

situated in close proximity to a number of existing industrial sources, is adjacent to the North Sea shoreline to enable the export CO₂ pipeline to be rapidly transported offshore and is also some distance from residential properties.

7. Summary of Environmental Effects

7.1 Introduction

- 7.1.1 The likely significant environmental effects of the Proposed Development are described in Chapter 8 - 24 of the ES (ES Volume I, Document Ref. 6.2) and its accompanying technical appendices (ES Volume III, Document Ref. 6.4). This section provides a brief summary of the overall findings of the EIA.
- 7.1.2 An assessment of the environmental effects of the Proposed Development during its construction and operation (including maintenance) has been completed for each of the topics that have been scoped for inclusion within the EIA.
- 7.1.3 During the eventual decommissioning of the Proposed Development, for the purposes of the EIA the effects are considered likely to be comparable to, or less than, those for construction activities (and controlled similarly) and therefore although these are discussed in each chapter of the ES, decommissioning effects have not been specifically mentioned within this NTS unless otherwise stated.

7.2 Air Quality

Introduction

- 7.2.1 Chapter 8: Air Quality (ES Volume I, Document Ref. 6.2) considers potential impacts from the Proposed Development on both human health and ecological receptors.
- 7.2.2 There are no Air Quality Management Areas (AQMAs) identified in the area with the potential to be affected by the Proposed Development.
- 7.2.3 Baseline air quality has been determined using available local authority and Defra published data and data collected by the Applicants.
- 7.2.4 The air quality assessment uses screening tools and computer models to predict the dispersion of air emissions from the Proposed Development including emissions associated with the construction of the Proposed Development and emissions from the proposed stacks (chimneys) of the operational development. These predict concentrations of pollutants in ambient air which are compared to national air quality standards where available, or other appropriate levels as agreed with regulators.

Effects During Construction

- 7.2.5 During construction, impacts could arise due to:
- dust from demolition and construction activities;
 - emissions from construction vehicles and mobile construction plant; and
 - emissions from construction phase road traffic (using traffic data in the form of traffic flows, composition and speed).

- 7.2.6 Through the use of standard construction management measures, which reduce dust and emissions from demolition, site clearance and site preparation activities, emissions to air from construction activities are assessed to have no significant adverse effects on human or ecological receptors. Such measures would include standard best practice construction measures such as appropriate storage of materials, suppression of dust from soil movement and material storage, cleaning of vehicles and locating construction plant away from sensitive receptors; these measures would be incorporated into the Final CEMP.
- 7.2.7 Based on expected vehicle movements, construction traffic air impacts are considered to be negligible at all human receptors and the effect is therefore not significant.
- 7.2.8 No additional mitigation other than the use of the CEMP has been identified as necessary for the construction phase of the Proposed Development.

Effects During Operation

- 7.2.9 During operation, impacts could arise due to:
- process emissions from the operational Proposed Development (stack emissions, including N-amines in respect of human health); and
 - emissions from operational road traffic (using traffic data in the form of traffic flows, composition and speed).
- 7.2.10 Dispersion modelling has been used to calculate the predicted concentrations of pollutants arising from the emissions to atmosphere for the operation of the Proposed Development.
- 7.2.11 Predicted ground level concentrations of relevant air pollutants (principally nitrogen oxides, ammonia and amines) due to air emissions from the operation of the Proposed Development have been assessed. No significant effects are expected to occur as a result of the Proposed Development at the identified human receptors.
- 7.2.12 The deposition of nutrient nitrogen on sensitive ecological receptors from the air emissions of nitrogen oxides and ammonia has also been calculated. No significant effects are expected to occur as a result of the Proposed Development at the identified ecological receptors based on the predicted concentrations and the areas of potential impact.
- 7.2.13 Emissions from the Proposed Development during operation will be carefully controlled and regulated by the Environment Agency through the Environmental Permit and in accordance with the use of Best Available Techniques (BAT). The Permit must be granted prior to operation of the Proposed Development. The Applicants are working with the Environment Agency and other parties to determine BAT for carbon capture plants given the First Of A Kind nature of the Proposed Development. An application for a permit in principle is being prepared by the Applicants for submission to the Environment Agency for determination alongside the DCO application.
- 7.2.14 An assessment of visible plume formation from the cooling plant has been undertaken which indicates that a short visible plume may be present for the

majority of the time once the Proposed Development becomes operational but is unlikely to cross the boundary of the power station site.

- 7.2.15 No detailed assessment of operational traffic emissions has been required, as the numbers of additional vehicles associated with the operational phase of the Proposed Development is relatively low and below the screening threshold at which detailed modelling of traffic emissions is required.

Summary

- 7.2.16 In summary no significant Air Quality effects are predicted during the construction or operation (including maintenance) of the Proposed Development.

7.3 Surface Water, Flood Risk and Water Resources

Introduction

- 7.3.1 Chapter 9: Surface Water, Flood Risk and Water Resources (ES Volume I, Document Ref. 6.2) presents the findings of the assessment of likely significant effects on the surface water environment (including inland, estuarine and coastal surface waters) and flood risk as a result of the Proposed Development.
- 7.3.2 Key water bodies that may receive runoff or discharges from the Proposed Development during construction, operation and decommissioning have been identified, and the potential contamination risk to these water bodies has been assessed. The Study Area for surface water has been defined based on the potential for impacts to occur. Consideration has also been given to the potential for use of and, if necessary, refurbishment of the existing former steelworks outfall to Tees Bay.
- 7.3.3 The main surface watercourses within or close to the Proposed Development are outlined in Section 3 of this NTS. There are also numerous minor watercourses and water features in and around the Proposed Development. The Site is not located within a Drinking Water Protected Area, Drinking Water Safeguard Zone or near any Source Protected Zones.
- 7.3.4 The PCC Site is located within Flood Zone 1 (low risk) as defined by the Environment Agency. A small area of the CO₂ Gathering Network and the Natural Gas Connection Corridor lies within Flood Zone 3 (high risk).

Effects During Construction

- 7.3.5 The assessment considered potential effects for the construction phase in relation to the following:
- temporary impacts on surface water quality;
 - temporary impacts on sediment dynamics and morphology in Tees Bay; and
 - increase in surface water run-off and groundwater flood risk.

- 7.3.6 No potentially significant effects during the construction phases have been identified. Potentially significant impacts on all surface waterbodies have been avoided by using trenchless technologies for pipeline installation (i.e. not involving trenching) for river crossings and the export pipeline construction which do not disturb the bed or bank habitats or mobilise sediments.
- 7.3.7 Potential significant adverse effects to water quality from suspended fine sediments and accidental spillages will be prevented or minimised through the use of a CEMP and preventative measures. While flood risk is low at the PCC Site, flooding arising from surface water on the Site will be minimised through the use of an appropriate drainage design.
- 7.3.8 Where construction is required in areas of higher flood risk, those works are relatively minor in nature, comprising construction of a pipeline that will either be located on existing pipe racks or buried underground. These works will be managed through the implementation of the CEMP to minimise the risk of increased flooding and to site any storage of materials away from areas of higher flood risk to reduce the risk of contamination.

Effects During Operation

- 7.3.9 The assessment considered potential effects for the operational phase in relation to the following:
- long term impacts on surface water quality (including those from thermal discharges);
 - long term impacts on waterbodies as a result of atmospheric emissions;
 - increase in surface water and groundwater flood risk; and
 - potable water demand.
- 7.3.10 A detailed drainage strategy, which will have regard to the findings of the of the FRA and water quality assessment, will be defined and prepared for the Proposed Development in consultation with the Environment Agency, the Lead Local Flood Authorities (RCBC and STBC) and other statutory bodies.
- 7.3.11 The proposed drainage system would provide attenuation capacity and treatment of runoff to ensure potential adverse effects on water quality are avoided.

Summary

- 7.3.12 In summary no significant effects are predicted for surface water, water resources and flood risk during the construction or operation (including maintenance) of the Proposed Development.

7.4 Geology, Hydrogeology and Contaminated Land

Introduction

- 7.4.1 Chapter 10: Geology, Hydrology and Contaminated Land (ES Volume I, Document Ref. 6.2) presents the findings of the assessment of likely significant effects on geology, soils and contaminated land as a result of the

Proposed Development. Consideration has been given to geology: superficial soils and bedrock, geological and hydrogeological designations, soils and agricultural land classification, existing contamination and minerals rights.

- 7.4.2 A desk-based assessment of historical ground condition information and information from historical site investigations have been used to identify the potential effects associated with ground conditions.

Effects During Construction

- 7.4.3 The construction phase of the Proposed Development will involve activities that may have potential impacts on the soils, geology, hydrogeology and potentially contaminated land resources. Following a ground investigation, targeted remediation will be undertaken involving either treatment of soils on-site or removal and disposal at a suitably permitted facility.
- 7.4.4 Potential impacts during the construction phase include :
- mobilisation of contaminants during remediation and construction;
 - changes to hydrogeological regimes (e.g. during dewatering activities); and
 - changes to surface water quantity and quality.
- 7.4.5 Impacts will be managed by appropriate construction mitigation measures (which will be outlined in the CEMP) and as such no significant adverse effects are anticipated.

Effects During Operation

- 7.4.6 The operational impacts of the Proposed Development with regards to geology, hydrogeology and contaminated land are associated with the permanent site infrastructure which includes plant and buildings, roadways, service corridors and areas of hardstanding.
- 7.4.7 The potential impacts (without mitigation) that could arise during the operational phase of the Proposed Development include:
- permanent soil loss where permanent infrastructure is installed. However, the loss is likely to be negligible given the low quality of the existing soils and the widespread existing industrial development (hardstanding) already present across the Site; and
 - impacts to soil quality, groundwater and watercourses, which could potentially occur during operation as a result of accidental spills from the handling or leakage of fuels, lubricants, stored chemicals and process liquids.
- 7.4.8 However, with appropriate management, housekeeping and preventative maintenance practices (such as appropriate storage of potentially contaminating chemicals), as required by the Environmental Permit that will be needed for the operational Site, potential impacts to soil and groundwater will be minimised. As such, significant adverse effects are not predicted to occur.

Summary

- 7.4.9 In summary no significant effects are predicted with regards to geology, hydrogeology and contaminated land during the construction or operation (including maintenance) of the Proposed Development

7.5 Noise and Vibration

Introduction

- 7.5.1 Chapter 11: Noise and Vibration (ES Volume I, Document Ref. 6.2) presents the findings of the assessment of likely significant noise and vibration effects as a result of the Proposed Development.
- 7.5.2 Potential noise sensitive receptors, residential, industrial (local offices), and ecological (birds associated with the Teesmouth and Cleveland Coast SSSI, SPA and Ramsar site), have been identified around the Site boundary. Noise levels during construction and operation of the Proposed Development have been predicted and the results compared with measured baseline noise levels at the identified receptors during the day and night. National standards have been applied to determine whether there is the potential for significant effects without further mitigation measures being applied.
- 7.5.3 The assessment has also considered the potential for vibration effects from construction, operation and decommissioning of the Proposed Development. Vibration is likely to occur for a short period of the construction works as piling is likely to be required for some of the main structures.

Effects During Construction

- 7.5.4 The assessment considered potential effects during construction in relation to the following:
- noise and vibration levels during site clearance, remediation, construction and piling works; and
 - predicted changes in road traffic noise levels on the local road network.
- 7.5.5 Based on the conservative assumptions made, no significant noise effects are predicted on residential, nearby industrial, or ecological receptors through the implementation of best practice measures to control construction noise that will be applied in accordance with Requirements of the draft DCO.

Effects During Operation

- 7.5.6 The assessment has concluded that no significant operational noise effects are predicted to occur at residential, industrial or ecological receptors during operations.

Summary

- 7.5.7 In summary no significant effects on residential, industrial or ecological receptors are predicted with regards to noise and vibration during the construction or operation (including maintenance) of the Proposed Development

7.6 Terrestrial Ecology and Nature Conservation

Introduction

- 7.6.1 Chapter 12: Terrestrial Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2) presents the findings of the assessment of likely significant effects on terrestrial ecology (habitats and protected species including bats) and nature conservation. Impacts on aquatic ecology, marine ecology and birds are assessed in Sections 7.7, 7.8 and 7.9 below.

Effects During Construction

Designated Sites

- 7.6.2 Given the that during the construction phase trenchless technologies for pipeline installation (i.e. not involving trenching) will be used there are no pathways by which there would be the potential for impacts (including noise and vibration) to designated sites including Teesmouth and Cleveland Coast SSSI. Therefore, direct impacts during construction on these sites have been mitigated by design and no further mitigation is required.

Habitats

- 7.6.3 Construction activities have the potential for the following impacts on habitats:
- permanent losses of semi-improved grassland habitat for the construction of the PCC Site;
 - temporary losses of additional areas of semi-improved grassland and scrub for temporary construction laydown and/or construction corridors; and
 - disturbance of Open Mosaic Habitats (OMH) habitats for construction of the Natural Gas Connection.
- 7.6.4 Measures have been proposed with the Indicative Landscape and Biodiversity Strategy that has been submitted with the draft DCO (Document Ref. 5.12) for reinstatement and enhancement of habitats within and around the PCC Site. As a result, no significant effects are predicted and it is the intention that biodiversity enhancement is achieved through the Proposed Development.

Species

- 7.6.5 No significant effects are predicted on terrestrial species as a consequence of construction activities, based on the absence of protected species identified within and near to the Proposed Development Site. However appropriate pre-construction surveys will be undertaken prior to works commencing to confirm that no protected species are present in working areas.

Effects During Operation

- 7.6.6 The main potential source of operational effects is from emissions to air from the operation of the Proposed Development. Operational noise effects on terrestrial ecological receptors will not be significant.
- 7.6.7 Based on the results of the operational air quality impact assessment (Appendix 8B, ES Volume III, Document Ref. 6.4) consideration has been

given to potential pathways for an air quality impact from operation of the PCC Site on nature conservation designations. This is further considered within the Habitats Regulations Assessment Report (Document Ref. 5.13) submitted with the draft DCO. No significant effects on any ecological receptors are predicted.

- 7.6.8 In addition, the EIA considers the potential for significant effects on bats as the only terrestrial ecological species with the potential to be impacted during operation at the PCC Site. No significant effects on bats or their conservation status are predicted, as lighting during the operation of the Proposed Development will be managed in accordance with the measures outlined within the Indicative Lighting Strategy (Document Ref. 5.11) prepared and submitted with the draft DCO.

Summary

- 7.6.9 In summary no likely significant effects on terrestrial nature conservation designations, habitats or species are anticipated as a consequence of construction or operation (including maintenance) of the Proposed Development.

7.7 Aquatic Ecology

Introduction

- 7.7.1 Chapter 13: Aquatic Ecology (ES Volume I, Document Ref. 6.2) presents a summary of the likely impacts on aquatic ecology (habitats and species) and nature conservation as a result of the Proposed Development.

Effects During Construction

- 7.7.2 During the construction phase, trenchless technologies for pipeline installation (i.e. not involving trenching) will be used for crossing watercourses or water bodies. There will therefore be no pathways by which there would be the potential for impacts to designated sites including the Teesmouth and Cleveland Coast SSSI. Therefore, direct impacts during construction on these sites have been mitigated by design and no further mitigation is required.
- 7.7.3 The assessment of the likely significant effects on aquatic ecology and nature conservation has therefore assessed other potential construction related impacts which include:
- impacts on undesignated habitats (watercourses and ponds) e.g. on water quality as a result of construction activities;
 - impacts on fish and their habitats e.g. through unavoidable release of sediments to water bodies; and
 - impacts on macroinvertebrates and macrophytes e.g. through reduced habitat quality which may result in the changes to the composition of the community.
- 7.7.4 These potential impacts can be mitigated by adherence to measures in the Construction and Environmental Management Plan (Appendix 5A, ES Volume

III, Document Ref. 6.4) and there will therefore be no significant effects during construction.

Effects During Operation

- 7.7.5 The assessment considers the potential for operational impacts which include:
- impacts from atmospheric deposition of nitrogen on ponds with the potential to result in nutrient enrichment;
 - indirect impacts on fish, macroinvertebrates and macrophytes on their habitats and water quality.
- 7.7.6 The assessment has concluded that the potential for effects on aquatic habitats and species associated with operation of the Proposed Development (when all of the likely impacts above are considered) will be not-significant. Run-off from the operational development at the PCC Site will be appropriately managed to minimise impacts on aquatic receptors. Similarly process wastewater will be appropriately treated and any discharge controlled through monitoring and control measures specified within the Environmental Permit.

Summary

- 7.7.7 no significant effects were identified on aquatic habitat, species and communities during the construction or operational phases of the Proposed Development. Therefore, no additional mitigation is necessary besides the current design of the Proposed Development, impact avoidance strategy and embedded mitigation.

7.8 Marine Ecology and Nature Conservation

Introduction

- 7.8.1 Chapter 14: Marine Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2) presents a summary of the likely impacts on marine ecology (habitats and species) and nature conservation as a result of the Proposed Development.
- 7.8.2 Marine ecological receptors have been identified in and around the Proposed Development through a desk-based study and ecological surveys in the surrounding area.
- 7.8.3 The Site is situated within or adjacent to the Teesmouth and Cleveland Coast Special Protected Area SPA/Ramsar site and the Teesmouth and Cleveland Coast Site of Special Scientific Interest (SSSI). These sites are designated for the protection of breeding/ non-breeding bird species and other important waterfowl species associated with the site and include a range of coastal habitats (sandflats and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes) within and around the Tees Estuary.
- 7.8.4 A number of protected or notable marine animal species have been identified as present, or potentially present, within the marine ecology study area which incorporates some areas of the Greater North Sea Ecoregion. These include harbour porpoise, minke whale, bottlenose dolphin and white-beaked dolphin, grey seal and harbour (or common) seal. In addition, several protected or

notable migratory and commercial fish and shellfish species have been identified.

Effects During Construction

7.8.5 Potential impacts to marine ecological receptors as a result of the Proposed Development have been identified and these include:

- direct loss and physical disturbance to habitat and species (including intertidal and subtidal benthic ecology, fish and shellfish and marine mammals) under the footprint of the marine construction works associated with the Water Connections through:
 - installation of rock armouring / scour protection around the outfall head if required;
 - creation of breakout points within the foreshore for the CO₂ Export Pipeline and (if required) replacement outfall installed using trenchless technologies; and
 - anchoring, grounding or positioning of work boat(s) and /or barge(s) on the seabed.
- physical disturbance to benthic habitats and species from increased suspended sediment concentrations (i.e. turbidity) and deposition;
- indirect effects to marine ecology from changes in marine water quality (excluding turbidity);
- changes in underwater soundscape; and
- changes in airborne soundscape.

7.8.6 Having taken into account the proposed design, good practice, underwater sound mitigation, and in general the temporary nature of the impacts the assessment has concluded no significant adverse effects to marine ecology from construction of the Proposed Development.

Effects During Operation

7.8.7 Potential impacts to marine ecological receptors as a result of the Proposed Development have been identified and these include:

- thermal effects from treated cooling water discharge;
- chemical effects from any treated wastewater discharge; and
- effects to intertidal habitats and species (including fish) from the deposition of airborne pollutants;

7.8.8 The cooling water and treated wastewater discharges will be controlled and discharged through either the existing or proposed outfall extending into the Tees Bay such that the residual thermal or pollutant levels rapidly disperse to insignificant levels. Monitoring and control of the discharges will be regulated by the Environment Agency through an Environmental Permit. Having taken into account the design and good practice the assessment has concluded no significant adverse effects to marine ecology from the operation of the Proposed Development.

Summary

- 7.8.9 In summary no likely significant effects on marine ecology are anticipated as a consequence of construction or operation (including maintenance) of the Proposed Development.

7.9 Ornithology

Introduction

- 7.9.1 Chapter 15: Ornithology (ES Volume I, Document Ref. 6.2) presents a summary of the likely impacts and effects to ornithological receptors as a result of the Proposed Development. The Site is situated within the Teesmouth and Cleveland Coast Special Protected Area SPA/Ramsar site and the Teesmouth and Cleveland Coast Site of Special Scientific Interest (SSSI).
- 7.9.2 In addition, a Habitats Regulations Assessment (HRA) (Document Ref. 5.13) has been prepared and submitted with the DCO application.

Effects During Construction

- 7.9.3 Potential impacts to ornithological receptors as a result of the construction of the Proposed Development that have been included within the assessment include:
- temporary degradation or losses of habitat;
 - disturbance of birds, principally from noise;
 - impacts from emissions such as dust, particulate matter, from construction plant and construction traffic;
 - increases in surface water run-off and flood risk;
 - changes in water quality from run-off to surface waters affecting wetland habitats used by birds and distribution/quality of foraging resources;
 - permanent losses of habitat used by nesting, roosting and feeding birds where new infrastructure is installed;
 - permanent losses of and physical impacts on subtidal habitats;
 - disturbance of marine birds arising from the presence of work boats and/or barges and the presence of construction workers in the offshore environment.
- 7.9.4 No likely significant residual effects have been identified following consideration of the relevant ornithological baseline conditions, potential impact pathways and the proposed embedded mitigation to be used during construction, which will be specified in the CEMP (including use of trenchless technologies for crossing Coatham Dunes and Sands and use of bored rather than impact piling).

Effects During Operation

- 7.9.5 Potential impacts to ornithological receptors as a result of the operation of the Proposed Development and that have been included within the assessment include:

- disturbance of birds, principally from noise (PCC Site and CO₂ Gathering Network)
- increases in surface water run-off and flood risk;
- emissions from operational vehicular traffic;
- point source emissions of NO_x, acid and nutrient nitrogen;
- impacts (thermal and chemical) on marine and benthic organisms arising from treated water discharge, resulting in reductions of available foraging resources for some fish-eating birds; and
- impacts of tall structures as a barrier to movement of birds for which Teesmouth and Cleveland Coast Ramsar, SPA and SSSI are designated.

7.9.6 Impacts predicted to arise as a result of the Proposed Development will be controlled, mitigated or compensated for through appropriate design and mitigation measures (cladding for example) and the location of the PCC Site. No significant residual effects on ornithological receptors are anticipated during the operation of the Proposed Development.

Summary

7.9.7 In summary no likely significant effects on ornithology are anticipated as a consequence of construction or operation (including maintenance) of the Proposed Development.

7.10 Traffic and Transport

Introduction

7.10.1 Chapter 16: Traffic and Transport (ES Volume I, Document Ref. 6.2) identifies the potential effects of the Proposed Development on traffic and transport in the surrounding area. The assessment considers the predicted number of vehicle movements generated during the construction and operation of the Proposed Development, and the sensitivity (including pedestrian and cyclist safety) and capacity of the local road network.

Effects During Construction

7.10.2 The construction phase will result in temporary increases of traffic flows, including HGVs. However, the assessment concludes that these additional traffic movements will not result in any significant effects. Any abnormal loads would be timed to minimise disruption following consultation with the local authority and secured through the requirements in the DCO; where possible the nearby Redcar Bulk Terminal and Teesport will be used for delivery of abnormal loads to minimise HGV movements on the public highway.

7.10.3 A construction worker traffic management plan and a construction HGV traffic management plan will be developed by the contractor in accordance with a Requirement in the draft DCO in order to manage and where possible, reduce the number of vehicles required. Consequently, the effects of construction traffic on all road links and junctions within the Study Area are considered to be not significant.

Effects During Operation

- 7.10.4 Operational staff movements (60 site-based staff working in three shifts and 40 office-based staff working normal hours) would result in average of 71 cars per day (142 two-way vehicle movements).
- 7.10.5 HGV traffic generated by deliveries of operational and maintenance plant will be relatively limited (expected to be a maximum of four HGVs per day). Fuel for the new power station will be natural gas imported to the PCC Site via pipeline and there will be no vehicular movements associated directly with this.
- 7.10.6 Due to the very low traffic flows which will result once the Proposed Development is first operational in 2026, the vehicle numbers generated during operation are therefore considered to be negligible and not significant.

Summary

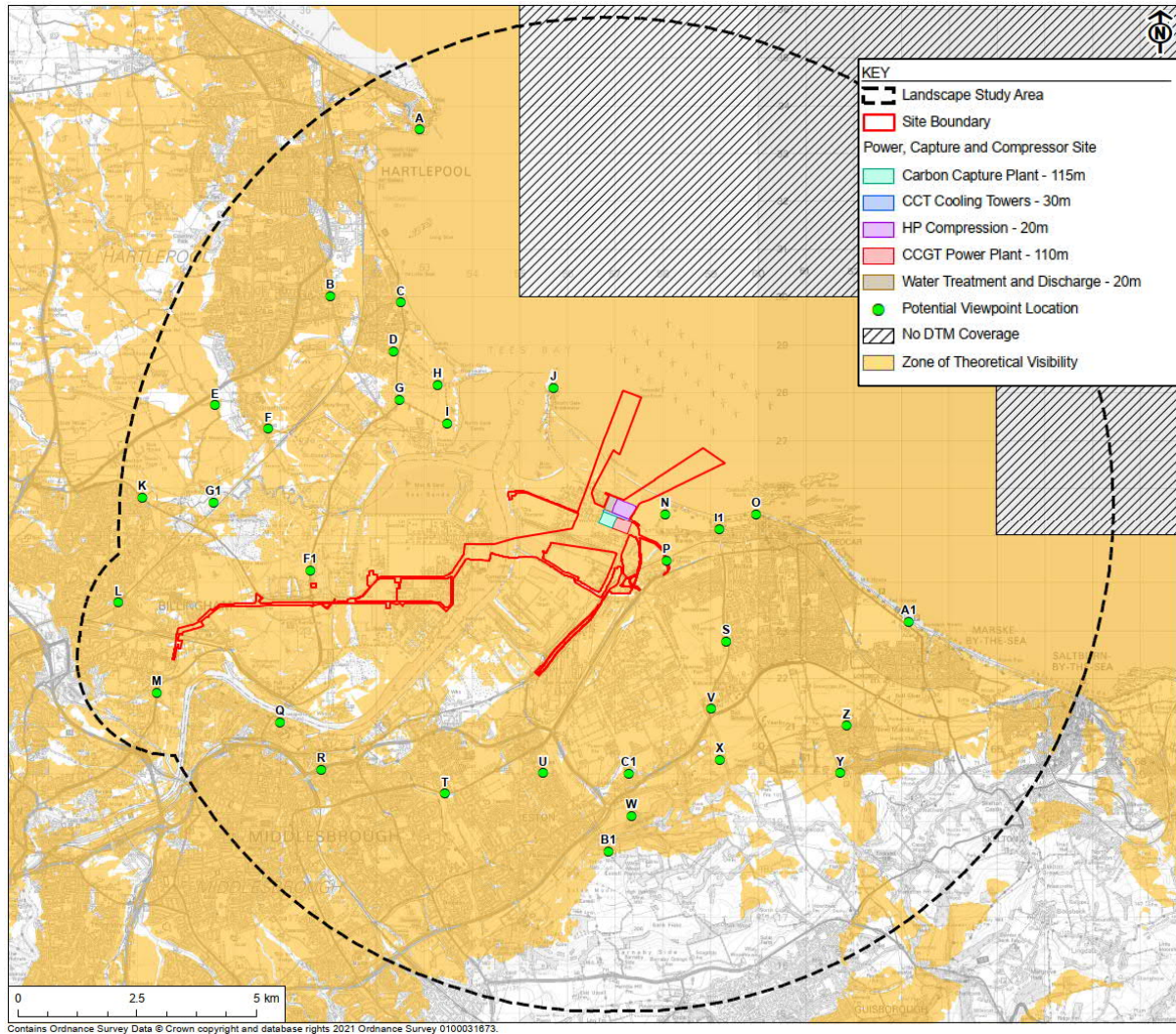
- 7.10.7 In summary no likely significant effects on traffic and transport are anticipated as a consequence of construction or operation (including maintenance) of the Proposed Development.

7.11 Landscape and Visual Amenity

Introduction

- 7.11.1 Chapter 17: Landscape and Visual Amenity (ES Volume I, Document Ref. 6.2) addresses the potential effects of the Proposed Development on landscape character and visual amenity.
- 7.11.2 The Study Area for landscape and visual effects includes areas where it is considered that there is potential for significant direct or indirect effects on landscape character or sensitive views due to the construction or operation of the Proposed Development.
- 7.11.3 The area in which the Proposed Development is likely to be visible (known as the Zone of Theoretical Visibility (ZTV)) is shown on Diagram NTS 11. Additionally, the visual assessment considers effects on 12 representative viewpoints located around the Proposed Development, due to changes during the construction, operation and decommissioning phases which are also shown on Diagram NTS 11.

Diagram NTS 11: ZTV and representative viewpoints



- 7.11.4 The assessment is based upon the largest possible dimensions for the Proposed Development and on a worst-case stack height of up to up to 128 m Above Ordnance Datum (AOD) for the absorber stack (which equates to 115 m above ground level) and 110 m AOD for the Heat Recovery Steam Generator (HRSG) stack, as these are considered to represent the worst-case scenario. Even using these dimensions, it is considered highly unlikely that significant effects would occur outside of the 10 km study area.
- 7.11.5 Due to the existing industrial character of the setting of the PCC Site and surrounding landscape, it is anticipated that there is a low likelihood that construction and operational effects will result in a long-term change to the existing landscape character at local, regional or national scale.

Effects During Construction

- 7.11.6 During construction, views for residential receptors at various viewpoints surrounding the Proposed Development will either be oblique or contain clear views of structures associated with the construction of the Proposed Development. At some viewpoints, views of ground level construction activities will be limited as a result of intervening vegetation and existing large-scale structures. No significant effects are predicted.
- 7.11.7 Moderate adverse (significant) effects are expected to occur at a small number of recreational receptors; South Gare Breakwater (Viewpoint 5), England Coastal Path (Viewpoint 7) and Redcar seafront (Viewpoint 8). These are likely to experience short-term moderate adverse (significant) effects during construction as a result of the close distance to the PCC Site and limited intervening vegetation.

Effects During Operation

- 7.11.8 During opening and operation no significant effects on residential receptors are predicted. There are expected to be moderate adverse (significant) effects at Viewpoint 7: England Coast Path as a result of the path's close proximity to the PCC Site. It is not possible to eliminate the visual impacts associated with the development PCC Site due to its scale. Mitigation is therefore not possible to reduce the visual intrusion of the buildings in the landscape and minimise impact on visual amenity. However, as far as reasonably practicable, the design of the Proposed Development will seek to minimise adverse impacts on visual amenity through appropriate siting of infrastructure and through the selected building materials and colours, as set out in the Design and Access Statement (Document Ref. 5.4) that accompanies the DCO application.

Summary

- 7.11.9 In summary there are no likely significant effects on landscape and residential receptors anticipated as a consequence of construction and operation (including maintenance) of the Proposed Development. Impacts on visual amenity are predicted during construction due to the close proximity of the PCC Site to receptors. As far as reasonably practicable, these impacts will be mitigated through siting and design.

7.12 Cultural Heritage

Introduction

- 7.12.1 Chapter 18: Cultural Heritage (ES Volume I, Document Ref. 6.2) considers the permanent and temporary impacts to cultural heritage assets which comprises archaeology, built heritage and historic landscape resulting from the construction and operation of the Proposed Development.
- 7.12.2 A summary of cultural heritage receptors is outlined in Section 3 of this NTS.
- 7.12.3 Known heritage assets have been avoided by design through the use of trenchless technologies for pipeline installation (i.e. not involving trenching) and the siting of infrastructure in an existing, above ground, pipeline racking network, where practicable. As such, the risk of impact to known heritage assets has been eliminated and additional mitigation measures are not required.

Effects During Construction

- 7.12.4 The assessment considers the likelihood temporary and permanent effects to heritage assets as a result of changes to their setting and permanent loss of heritage value as a result of construction related activities.
- 7.12.5 There would be no impacts on archaeological remains or cultural heritage assets during construction. Known heritage assets have been avoided by design through the use of trenchless technologies and the use of existing service corridors for pipelines. As such, the risk of impact to known heritage assets has been eliminated and additional mitigation measures are not required.
- 7.12.6 A protocol will be adopted in order to mitigate any impacts to previously unknown archaeological assets that may be encountered during construction and will ensure that any finds are promptly reported, archaeological advice is obtained, and any recovered material receives the appropriate level of stabilisation, recording and conservation, proportionate to its heritage value.

Effects During Operation

- 7.12.7 There would be no impacts to buried archaeological remains during operation. The Proposed Development would represent a new component into an existing industrial landscape. Its inclusion within the visual setting of heritage assets is not incongruous to the current setting and would not result in significant change the theses asset's setting or value.

Summary

- 7.12.8 In summary no likely significant effects on cultural heritage are anticipated as a consequence of construction and operation (including maintenance) of the Proposed Development.

7.13 Marine Heritage

Introduction

- 7.13.1 Chapter 19: Marine Heritage (ES Volume I, Document Ref. 6.2) assesses the potential impacts of the Proposed Development during the construction and operation of the Proposed Development.

Effects During Construction

- 7.13.2 No significant effects are predicted to occur during construction of the Proposed Development on any designated or undesignated paleoenvironmental assets or any designated maritime assets as the CO₂ Export Pipeline and replacement Water Discharge corridors have been located to avoid known marine heritage assets.

Effects During Operation

- 7.13.3 There will be no physical impact upon any heritage assets during operation of the Proposed Development.

Summary

- 7.13.4 In summary no likely significant effects on cultural heritage are anticipated as a consequence of construction and operation (including maintenance) of the Proposed Development.

7.14 Socio- economics and Tourism

Introduction

- 7.14.1 Chapter 20: Socio Economics (ES Volume I, Document Ref. 6.2) addresses the potential effects of the Proposed Development on employment, local businesses and the local population during both the construction, operation and decommissioning phases. The assessment has taken into account the demographics of the area surrounding the Proposed Development when considering the impacts which are likely to occur.

- 7.14.2 Economic benefits can arise directly (through employment of local people) and indirectly (e.g. during the construction phase, when contractors may be using local accommodation and other amenities).

Effects During Construction

- 7.14.3 Net construction employment created by the construction phase of the Proposed Development is predicted to have a major beneficial (significant) short-term effect in the local area with increased local demand for accommodation having a positive impact on the local economy.

- 7.14.4 Construction is anticipated to last for up to four years and is estimated to generate a minimum of 1,760 net construction jobs to support the Proposed Development. It is anticipated that a minimum of 880 are expected to be from the Middlesbrough and Stockton Travel to Work Area (TTWA). Proposed skills and employment enhancement programmes provided by the Applicant are also expected to bring a positive impact.

- 7.14.5 Minor disruption on the local community, businesses, tourism and wider amenities is expected during construction but it is not expected to generate any significant effects. Additionally, use of some public rights of way including the Teesdale Way and England Coast path may be temporarily disrupted during construction which will require either controlled access to allow crossing of construction areas or, as a last resort, temporary diversions.

Effects During Operation

- 7.14.6 The Proposed Development will generate long-term jobs once operational. Operation of the Proposed Development is estimated to generate a total of 100 direct employees, of which 90 are anticipated to be from the TTWA. The direct, indirect and induced employment created by the operational phase of the Proposed Development is likely to have a moderate beneficial (significant) long-term effect.
- 7.14.7 There is expected to be a negligible effect on community disruption and demographic change.

Summary

- 7.14.8 In summary significant (beneficial) effects on socio-economics and tourism are anticipated as a consequence of construction and operation (including maintenance) of the Proposed Development.

7.15 Climate Change

Introduction

- 7.15.1 Chapter 21: Climate Change (ES Volume I, Document Ref. 6.2) assesses the potential impacts of the construction and operation of the Proposed Development on the climate and the impact of future climate change on the Proposed Development and surrounding environment.
- 7.15.2 The assessment includes:
- Greenhouse Gas impact assessment (the potential effect the Proposed Development may have on GHG emissions and therefore climate change);
 - In-combination climate change impacts (ICCI) (the combined effect of the Proposed Development and climate change on surrounding receptors); and
 - Climate change resilience review (the resilience of the Proposed Development to future projections for climate change).

GHG Assessment Summary

- 7.15.3 The receptor for the GHG assessment is the global climate. The UK's carbon budgets are used as a proxy to assess the impacts to this receptor.
- 7.15.4 Emissions associated with the Proposed Development have been examined for their significance against the UK Carbon Budgets for the ES. However, the Proposed Development is a low carbon generating station capturing more than 90% of the carbon that would otherwise be emitted. It also facilitates the future capture of carbon emitted from existing industrial sources in the area.

7.15.5 It has been concluded that the magnitude of impact of the Proposed Development is therefore considered 'low' against the current UK carbon budgets. The overall significance of effect is considered as minor adverse which is not significant and therefore the operations of the Proposed Development are not expected to affect the UK in meeting its current Carbon Budgets.

7.15.6 Once neighbouring industries are able to connect to the CO₂ gathering network and carbon can be captured from existing sources, it is envisaged that the project as a whole could result in a net reduction in carbon emissions from current levels and a beneficial effect on annual UK carbon emissions.

In-Combination Climate Impact Assessment Summary

7.15.7 The In-Combination Climate Impact (ICCI) assessment considers the existing and projected future climate conditions for the geographical location and assessment timeframe. It identifies the extent to which identified receptors in the surrounding environment are potentially vulnerable to and affected by these factors.

7.15.8 Factors considered as part of the assessment include:

- extreme weather;
- precipitation change;
- temperature and humidity;
- sea level rise;
- sea temperature; and
- wind.

7.15.9 No potential ICCI impacts or effects during construction, operation or decommissioning of the Proposed Development have been identified.

Climate Change Resilience Summary

7.15.10 The potential impacts and effects of projections for climate change to the Proposed Development have been assessed and resilience measures assumed to be built into the design taken into account. These include use of Sustainable Drainage Systems (SuDS) to mitigate flood risk. The embedded design measures are deemed sufficient to reduce the likelihood or consequence of an impact occurring as a result of these projected climate hazards. As such, no significant resilience risks have been identified.

7.16 Major Accidents and Natural Disasters

Introduction

7.16.1 Chapter 22: Major Accidents and Natural Disasters (MA&NDs) (ES Volume I, Document Ref. 6.2) presents an assessment of the MA&NDs that have the potential to arise during the construction and operation of the Proposed Development.

7.16.2 Major accidents are incidents such as fires and explosions that could result in serious harm to people. They also have the potential to cause widespread damage to property and the environment. Disasters can be naturally occurring events, such as earthquakes, landslides and flooding. The impact of MA&NDs can be very significant, but the likelihood of occurrence is low.

Summary

7.16.3 Fifteen hypothetical MA&NDs scenarios were identified for the Proposed Development which would have significant consequences to people and the environment, but at a very low probability of occurrence. These scenarios include fire, explosion, toxic release, high rainfall and storm surges from the River Tees.

7.16.4 The engineering design, construction and operation of the Proposed Development will incorporate appropriate standards and mitigation measures necessary to reduce the risks of MA&NDs to an acceptable level, i.e. as low as is reasonably practicable (ALARP), which is the standard expected by the Regulatory Authorities (Health and Safety Executive (HSE) and Environment Agency). As well as an Environmental Permit, if appropriate, the operational plant will be regulated under a Control of Major Accident Hazards (COMAH) Licence regulated by the HSE.

7.16.5 Consequently, based on the design of the Proposed Development and the proposed operational control measures to be applied, no significant effects have been identified.

7.17 Population and Human Health

Introduction

7.17.1 Chapter 23: Population and Human Health (ES Volume I, Document Ref. 6.2) addresses the potential effects of the Proposed Development upon human health, taking into account information relating to key aspects of the other technical assessments that are relevant to human health, as well as information on potential electromagnetic field (EMF) health effects from electricity cables associated with the Proposed Development.

7.17.2 The assessment identifies the potential effects on the health and wellbeing of those communities in Redcar, Stockton-on-Tees and Teesside as a consequence of the Proposed Development.

Summary

7.17.3 The Proposed Development incorporates embedded mitigation measures to avoid any significant human health effects. These include (but are not limited to):

- determination of an appropriate stack height based on air quality modelling to ensure no significant adverse effects on human receptors;
- process emissions to air will comply with the Emission Limit Values (ELV) specified in the Environmental Permit and based on the use of Best Available Techniques;

- measures to reduce traffic for example the implementation of a Construction Worker Travel Plan;
- implementation of an appropriate drainage system for process, foul and surface wastewater together with appropriate wastewater treatment prior to discharge;
- pollution prevention measures during construction and operation;
- operation in compliance with an Environmental Permit regulated by the Environment Agency; and
- use of below ground installation of electrical transmission cables to avoid effects from electromagnetic fields on humans.

7.17.4 These measures will help to ensure that impacts on the health and well-being of the local population, as well as construction workers and operational staff, are not significant. In summary significant effects relating to population and human health are restricted to beneficial construction and operation employment effects. No significant adverse human health effects have been identified.

7.18 Cumulative and Combined Effects

7.18.1 The purpose of Chapter 24: Cumulative and Combined Effects (ES Volume I, Document Ref. 6.2) is to provide an assessment of the potential for cumulative and combined effects to occur as a result of the Proposed Development being built and operated at the same time as other committed developments.

7.18.2 The potential for cumulative effects with these other developments has been considered for all of the environmental topics by a review of the available information (including published environmental information where available). A number of other developments have been identified with the potential for cumulative effects including the York Potash developments, Redcar Energy Centre and the wider Teesworks development proposals.

7.18.3 No significant additional cumulative or combined effects during either construction or operation have been identified.

8. Summary and Conclusions

- 8.1.1 The ES explains the findings of the EIA process that has been undertaken for the Proposed Development.
- 8.1.2 Following assessment of a comprehensive range of environmental topics as agreed through the EIA Scoping and wider consultation process the following significant residual effects (adverse and beneficial) (i.e. effects after implementation of mitigation where mitigation measures are proposed) have been identified:
- significant adverse visual effects from nearby viewpoints during construction and operation of the Proposed Development; and
 - significant beneficial socio-economic effects (through the creation of employment) during construction and operation of the Proposed Development.
- 8.1.3 A number of environmental impact avoidance, design and mitigation measures have been identified to mitigate and control environmental effects during construction and operation of the Proposed Development. These will be secured through appropriate requirements within the DCO for the Proposed Development. Additional controls will be applied through other legislative requirements including an Environmental Permit and, if required, a COMAH Licence for the operation of the Proposed Development.
- 8.1.4 Whilst there are no significant visual effects on residential receptors, there are impacts on visual amenity during construction (South Gare, England Coast Path and Redcar seafront) and operation (England Coast Path only) of the PCC Site. Due to the nature and scale of the development, it is not possible to mitigate the impacts on visual amenity on nearby receptors associated with the construction and operation of the PCC Site. However, as far as reasonably practicable the design of the Proposed Development will seek to minimise adverse impacts on visual amenity through appropriate siting of infrastructure and architectural design of the development (including choice of materials and colours).