H2Teesside Project

Land at and in the vicinity of the former Redcar Steel Works site, Redcar and in Stockton-on-Tees, Teesside

Environmental Impact Assessment: Scoping Report

Document Reference: EIA Scoping

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

Applicant: H2 Teesside Ltd

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GLOSSARY

Abbreviation	Term
AEP	Annual Exceedance Probability
AGI	Above Ground Installation
AIL	Abnormal Indivisible Load
ALARP	As Low As Reasonably Practicable
ALC	Agricultural Land Classification
AOD	Above Ordnance Datum
APFP Regulations	Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)
Applicant	H2 Teesside Limited
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
ASU	Air Separation Unit
ATR	Auto Thermal Reforming
BAP	Biodiversity Action Plan
BEIS	Former Department for Business, Energy and Industrial Strategy
BESS	British Energy Security Strategy
bgl	Below ground level
BGS	British Geological Survey
BMV	Best and Most Versatile
BNG	Biodiversity Net Gain
BOC	British Oxygen Company
BRE	Building Research Establishment
BRES	Business Register and Employment Survey
BS	British Standard
BSI	British Standards Institute
BTO	British Trust for Ornithology
CAA	Civil Aviation Authority
CCPP	Combined Cycle Power Plant (see also CCGT)
CCR	Carbon Capture Readiness
CCR	Climate Change Resilience
CCS	Carbon Capture and Storage
CCG	Clinical Commissioning Group

Abbreviation	Term
CCGT	Combined Cycle Gas Turbine
CCUS	Carbon Capture, Usage and Storage
CDM	Construction (Design and Management) Regulations 2007
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CEMP	Construction Environmental Management Plan
CH_4	Methane
CHP	Combined Heat and Power
CIBSE	Chartered Institution of Building Services Engineers
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists
CIRIA	Construction Industry Research and Information Association
CLP	Classification, Labelling and Packaging Regulations
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
COMAH	Control of Major Accident Hazards
COPA	Control of Pollution Act 1974
COPD	Chronic Obstructive Pulmonary Disease
CRoW	Countryside and Rights of Way
CRTN	Calculation of Road Traffic Noise
CSM	Conceptual Site Model
COVID-19	Coronavirus
CTMP	Construction Traffic Management Plan
CWS	Cooling Water System
CWTP	Construction Worker Travel Plan
DAF	Dissolved Air Flotation
DAS	Discretionary Advice Service
DBA	Desk-Based Assessment
DCLG	Former Department for Communities and Local Government (now DLUHC)
DCO	Development Consent Order
DECC	Former Department of Energy and Climate Change (later part of BEIS, now DESNZ)
Defra	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DLL	District Level Licencing
DLUHC	Department for Levelling-up, Housing and Communities
DML	Deemed Marine Licence
DMRB	Design Manual for Roads and Bridges
DMW	Demineralised Water
DNA	Deoxyribonucleic Acid
DTM	Digital Terrain Model
EcIA	Ecological Impact Assessment
eDNA	Environmental DNA
EEA	European Economic Area
EHO	Environmental Health Officer

Abbreviation	Term
EIA	Environmental Impact Assessment
EMF	Electromagnetic Fields
EMODnet	European Marine Observation Data Network
EMS	Environmental Management System
EPC	Engineering, Procurement and Construction
EPSM	European Protected Species Mitigation (Licence)
ERIC	Environmental Records Information Centre North-East
ES	Environmental Statement
ETP	Effluent Treatment Plant
EU	European Union
EUNIS	European Union Nature Information System
EWP	Energy White Paper
FEED	Front End Engineering Design
FRA	Flood Risk Assessment
FRfSW	Flood Risk from Surface Water
GAC	Generic Assessment Criteria
GCN	Great Crested Newt
GHG	Greenhouse Gas
GI	Ground Investigation
GLVIA3	Guidelines for Landscape & Visual Impact Assessment (third edition)
GWth	Gigawatt Thermal
H_2	Hydrogen (gaseous)
Ha	Hectare
HCA	Former Homes and Communities Agency
HDD	Horizontal Directional Drill
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HPI	Habitat of Principal Importance
HRA	Habitats Regulations Assessment
HSE	Health and Safety Executive
HSI	Habitat Suitability Index
HV	High Voltage
IAMMWG	Inter-Agency Marine Mammal Working Group
IAQM	Institute of Air Quality Management
ICCI	In-combination Climate Change Impacts
ICES	International Council for the Exploration of the Sea
IEA	Institute of Environmental Assessment
IEMA	Institute of Environmental Management and Assessment
IHBC	Institute of Historic Building Conservation
INCA	The Industry Nature Conservation Association
INNS	Invasive and Non-Native Species
ISO	International Organization for Standardization
JNCC	Joint Nature Conservation Committee
kV	Kilovolt
LHV	Lower Heating Value

Abbreviation	Term
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LP	Low Pressure
LPA	Local Planning Authority
LSOA	Lower Layer Super Output Area
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
MAGIC	Multi-Agency Geographical Information for the Countryside
MA&Ds	Major Accidents and (Natural) Disasters
MBT	Micro-bored Tunnel
MCAA	Marine and Coastal Access Act (2009)
MCZ	Marine Conservation Zones
MHCLG	Ministry of Housing, Communities and Local Government
MHWS	Mean High Water Springs
ML	Marine Licence
MMO	Marine Management Organisation
MNCR	Marine Nature Conservation Review
MAOP	Maximum Allowable Operating Pressure
MoU	Memorandum of Understanding
MP	Medium Pressure
MPA	Mineral Planning Authority
MPS	Marine Policy Statement
MSA	Mineral Safeguarding Area
Mt	Megatonne
MW	Megawatt
NBN	National Biodiversity Network
NCA	National Character Area
NEP	Northern Endurance Partnership
NERC Act	Natural Environment and Rural Communities Act (2006)
NGG	National Gas Grid
NGR	National Grid Reference
NH_3	Ammonia
NNR	National Nature Reserve
NO_x	Oxides of Nitrogen
NPG	Northern Power Grid
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NPSE	Noise Policy Statement for England
NRMM	Non-Road Mobile Machinery
NSIP	Nationally Significant Infrastructure Project
NSR	Noise Sensitive Receptor
NTS	Non-Technical Summary
NZT	Net Zero Teesside
O_2	Oxygen
ONS	Office for National Statistics
PA 2008	Planning Act 2008

Abbreviation	Term
PAH	Polycyclic Aromatic Hydrocarbon
PCC	Power, Capture and Compressor
PEI	Preliminary Environmental Information
PINS	Planning Inspectorate
PHE	Public Health England, the former name of the UK Health Security Agency
PHOF	Public Health Outcomes Framework
PM	Particulate Matter
$PM_{2.5}$	Particulate matter of 2.5 micrometres (µm) diameter or less
PM_{10}	Particulate matter of 10 micrometres (µm) diameter or less.
PPG	Planning Practice Guidance
PRoW	Public Right of Way
PSA	Pressure Swing Adsorber
PSR	Pipelines Safety Regulations
PSYM	Predictive System for Multimetrics
PWS	Private Water Supply (abstractions)
RBT	Redcar Bulk Terminal
RCBC	Redcar and Cleveland Borough Council
REC	Redcar Energy Centre
REP	Renewable Energy Plant
RO	Reverse Osmosis
RMP	Regeneration Master Plan
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SCANS	Small Cetacean Abundance in the European Atlantic and North Sea
SCOS	Special Committee on Seals
SCR	Selective Catalytic Reduction
SMRU	Sea Mammal Research Unit
SMU	Seal Management Unit
SNS	Southern North Sea
SoCC	Statement of Community Consultation
SoS	Secretary of State
SO_x	Sulphur Oxides
SPA	Special Protection Area
SPZ	Source Protection Zone
SSI	Sahaviriya Steel Industries (UK Limited)
SSSI	Site of Special Scientific Interest
STBC	Stockton-on-Tees Borough Council
STDC	South Tees Development Corporation
STG	Steam Turbo Generator
SuDS	Sustainable (urban) Drainage System
SPD	Supplementary Planning Document
Syngas	Mixture comprising H_2, CO, and CO_2 produced at an intermediary stage of Blue Hydrogen production
TA	Transport Assessment
TraC	Transitional and Coastal

Abbreviation	Term
TTWA	Travel to Work Area
TVCA	Tees Valley Combined Authority
UF	Ultrafiltration
UK	United Kingdom
UKCP18	UK Climate Projections 2018
UPS	Uninterruptable Power Supply
UXO	Unexploded Ordnance
WBCSD	World Business Council for Sustainable Development
WeBS	Wetland Bird Survey
WFD	Water Framework Directive
WHO	World Health Organisation
Withdrawal Act	European Union Withdrawal Agreement Act (2020)
WPA	Waste Planning Authority
WRI	World Resources Institute
WwTW	Wastewater Treatment Works
ZTV	Zone of Theoretical Visibility

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TABLES

PLATES

1.0 INTRODUCTION

1.1 Background

1.1.1 AECOM Ltd ('AECOM') has been commissioned by H2 Teesside Ltd (hereafter referred to as 'the Applicant') to prepare an Environmental Impact Assessment (EIA) Scoping Report to inform the scope and content of an EIA for the construction, operation (including maintenance where relevant) and decommissioning of a 1.2 Gigawatt Thermal (GWth) Hydrogen Production Facility with associated Carbon Capture and hydrogen transport pipeline network on land in Redcar and Cleveland, Stockton-on-Tees, and Hartlepool on Teesside (hereafter referred to as the 'Proposed Development Site') (see Figure 1, Appendix A).

1.1.2 The Hydrogen Production Facility (hereafter referred to as the 'Production Facility') together with the hydrogen gas (H_2) pipeline network to deliver low carbon H_2 to offtakers who may potentially use the H_2 in the future, and the CO_2 export, natural gas, electricity, water, oxygen (O_2) and nitrogen (N_2) connections required for the facility to operate are herein referred to as the 'Proposed Development'. The proposed Production Facility will produce low carbon hydrogen which is compliant with the UK Government's Low Carbon Hydrogen Standard (Department for Business, Energy and Industrial Strategy (BEIS), 2022) which defines what constitutes 'low carbon hydrogen' up to the point of production. The intent of the standard is to ensure new low carbon hydrogen production supported by government makes a direct contribution to the UK's greenhouse gas (GHG) emissions reduction targets.

1.1.3 The Proposed Development is subject to ongoing technical studies; however, it is expected to comprise the Production Facility with a design capacity of up to 1.2 GWth Lower Heating Value (LHV), across two phases of development (up to 600 Megawatt thermal (MWth) per phase).

1.1.4 The Production Facility and associated infrastructure which form part of the Proposed Development will be located on the 'Main Site'. There are currently two Main Site options – the Foundry ('Main Site A') on land formerly part of the Redcar Steelworks and adjacent land at Redcar Bulk Terminal (RBT) ('Main Site B'), as indicated on Figures 3 and 3a (Appendix A) respectively.

1.1.5 The proposed hydrogen transport pipelines and other connections (the 'Connection Corridors') will also cross other third-party land where required. Together, the Main Site and Connection Corridors are referred to as the Proposed Development Site.

1.1.6 The Proposed Development Site boundary and the location of the two Main Site options, Hydrogen Pipeline Corridor and indicative other Connection Corridors are shown in Figures 3-9 in Appendix A.

1.1.7 This EIA Scoping Report considers the environmental context of the Proposed Development Site and the potential environmental impacts of the Proposed Development. Where impacts are considered to have the potential to cause significant environmental effects, these are identified and the proposed approach to be used to characterise the impacts and understand the significance of their effects

is outlined. This report also outlines issues perceived to be non-significant, which do not require formal assessment as part of the EIA.

1.1.8 EIA is an iterative process that feeds into the engineering design process to identify potential significant environmental effects which require mitigation. The final design iteration, along with the findings of the EIA will be reported in an Environmental Statement (ES), in accordance with the Infrastructure Planning (EIA) Regulations 2017 ('EIA Regulations') and will be submitted with the Development Consent Order (DCO) application ('the Application') in accordance with Regulation 5 (2)(a) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) ('APFP Regulations').

1.2 Consenting Regime

Development Consent Orders

1.2.1 Under the Planning Act 2008 (PA 2008), development consent can be granted in the form of a DCO for certain types of 'Nationally Significant Infrastructure Projects' (NSIPs) by the relevant Secretary of State (SoS) – in the case of energy infrastructure projects this is the SoS for the Department of Energy Security and Net Zero (DESNZ).

1.2.2 Section 14 'Nationally significant infrastructure projects: general' of the PA 2008 confirms the types of projects that are NSIPs and which require development consent. Section 14 does not include the construction and operation of H_2 production facilities but does include the "*construction of a pipe-line other than by a gas transporter"* that would require *"authorisation under … the Pipe-lines Act 1962"*. According to the Pipe-Lines Act, a cross-country pipeline means a pipeline whose length exceeds, or is intended to exceed 16.093 km (i.e. 10 miles), and a pipeline is defined as a pipe or system of pipes for the conveyance of anything other than air, water, water vapour or steam. Therefore, the hydrogen pipeline as currently proposed would require development consent.

1.2.3 Although works to construct and operate the Production Facility itself do not fall under the definition of a NSIP, the Applicant has sought a direction under Section 35 of the PA 2008 from the SoS to give a direction that the Hydrogen Production Facility should be treated as development for which development consent is required under Section 35 of the 2008 Act alongside the hydrogen pipelines. On the 22nd December 2022 the SoS took the decision within the conditions as required by sections 35A of the PA 2008, and issued a Direction under sections 35(1) and 35ZA that the Hydrogen Production Facility and any aspect of the hydrogen pipelines that are not automatically NSIP are to be treated as development for which development consent is required. The other aspects of the Proposed Development are being brought forward as 'Associated Development' to that development.

1.2.4 As a result of the above, the Applicant is required to seek a DCO to construct and operate the Proposed Development, under the PA 2008. Section 37 governs the form, content and accompanying documents that are required as part of a DCO application. The requirements are implemented through the APFP Regulations which

state that an application must be accompanied by an ES, where a development is 'EIA development' under the EIA Regulations.

1.2.5 The Application will be submitted to the Planning Inspectorate ('PINS') who will examine the application and make recommendations to the SoS for DESNZ pursuant to the PA 2008, who will subsequently determine whether a DCO should be granted for the Proposed Development.

Environmental Impact Assessment

1.2.6 Regulation 3(1) of the EIA Regulations defines the meaning of 'EIA development' (with reference to Schedules 1 and 2 to the EIA Regulations).

1.2.7 Schedule 1 of the EIA Regulations describes developments for which an EIA is necessary in all cases. The Proposed Development as a whole does not meet any of the definitions of Schedule 1. However, certain parts of the Proposed Development meet the definition of Schedule 1 Section 23 "*Installations for the capture of carbon dioxide streams for the purposes of geological storage pursuant to Directive 2009/31/EC from installations referred to in this Schedule, or where the total yearly capture of carbon dioxide is 1.5 megatonnes or more*".

1.2.8 Based on current projections (including Phase 1 and Phase 2 of the Proposed Development), H2Teesside will have the capacity to continuously export approximately 2.84 Megatonnes (Mt)/year (at 100% utilisation) of dehydrated and compressed carbon dioxide (CO_2), with no on-site temporary CO_2 storage required, resulting in the capture of more than 1.5 Mt of CO_2 per year for onward geological storage to the off-shore Endurance store via Northern Endurance Partnership (NEP) infrastructure on the nearby Net Zero Teesside (NZT) site. The NEP infrastructure and Endurance store will both be separately consented.

1.2.9 Although part of the Proposed Development meets the description of development in Schedule 1 and therefore EIA would be required, a review of Schedule 2 has also been completed for thoroughness.

1.2.10 When considering the Proposed Development in relation to the descriptions of development for the purposes of definition of 'Schedule 2 Development' it is considered that the Proposed Development does meet the following descriptions:

- *3(a) industrial installations for the production of electricity, steam and hot water (projects not included in Schedule 1 to these Regulations);*
- *3(b) industrial installations for carrying gas, steam and hot water; transmission of electrical energy by overhead cables (projects not included in Schedule 1 to these Regulations); and*
- *10(k) oil and gas pipeline installations (unless included in Schedule 1 to these Regulations).*

1.2.11 Given the above the Proposed Development is considered 'EIA development' and consequently a formal EIA screening opinion is not being sought from the SoS. Furthermore, having regard to the nature and scale of the proposed activities

comprised in the overall Proposed Development, such that some form of environmental assessment would likely be required in any event (even if not EIA) for the aspects that are not 'EIA development', the Applicant intends to provide all environmental assessments for the Proposed Development in a single ES.

1.2.12 This report constitutes the Applicant's notification under Regulation 8(1b) of the EIA Regulations. Having determined that an ES will be included as part of the Application, which will present the details of the EIA of the Proposed Development, in accordance with Regulation 10(1) of the EIA Regulations the Applicant is applying to the SoS for their opinion as to the scope and level of detail of the information to be provided in the ES in respect of the full Proposed Development.

1.2.13 The indicative Proposed Site Boundary (referred to as the 'Proposed Development Site') is shown on Figure 2: Proposed Development Site Boundary (including location of Main Site A) and Figure 2a: Proposed Development Site Boundary (including location of Main Site B), in Appendix A. At this stage, the Proposed Development Site Boundary has been refined as much as possible based on current design information and reflects a worst-case scenario of those areas that may be required for the construction and operation of the Proposed Development, including the Production Facility, hydrogen pipeline and connections, as well as indicative laydown areas for construction. The Proposed Development Site will be further refined as the design and further studies progress.

Deemed Marine Licence

1.2.14 In England, the Marine and Coastal Access Act 2009 (MCAA) provides that a Marine Licence (ML) is required for certain 'licensable activities' within the UK Marine Area (Section 42, MCAA). For the purposes of the EIA, the marine environment is defined as any area seaward of the mean high-water springs (MHWS) mark of any tidally influenced water body (anything below MHWS). This includes intertidal zones, which are periodically exposed by the tide and subtidal zones which are always submerged.

1.2.15 It is acknowledged that for the purposes of marine consenting, the UK Marine Area (Section 42, Marine and Coastal Access Act 2009) also includes areas which are temporarily or permanently separated from the natural course of the tide (i.e.by a lock gate or other similar means).

1.2.16 MLs can be issued via a 'standalone' Marine Licence Application (MLA) or a licence 'deemed' within the body of the DCO (i.e. a Deemed Marine Licence (DML)). The Marine Management Organisation (MMO) is the body responsible for issuing, revoking and enforcing a ML, other than where a licence is in the form of a DML, in which case the SoS has the power to grant it.

1.2.17 Some aspects of the Proposed Development are likely to require a ML, namely the construction and operation of the crossing of the River Tees for the proposed hydrogen pipeline, and the potential for crossings of Greatham Creek where below MHWS, north of the Tees and to the west of the Main Sites. The design work for all crossings is ongoing, however, currently it is proposed that the crossing under the Tees will be constructed using either Horizontal Directional Drilling (HDD) or Micro

Bored Tunnelling (MBT) techniques, thereby minimising disturbance during construction. For other areas including the areas around Greatham Creek and Seal Sands various construction methodologies are being considered. Further detail is provided in Section 3.5.

1.2.18 The Application will therefore include a request to secure the ML for activities below MHWS via a DML. The scope of the DML will be discussed and agreed in consultation with the MMO throughout the DCO process.

1.3 The Applicant

1.3.1 The Applicant is H2 Teesside Limited, a bp company, who will be the lead developer and operator for the Production Facility and new hydrogen pipelines. The Proposed Development will support the decarbonisation of UK-produced natural gas landed in Teesside for use in industrial applications and is also a key contributor to restoring manufacturing jobs in the Tees Valley as well as towards achieving national targets in relation to net zero.

1.3.2 H2Teesside will export CO_2 to the NEP offshore storage facility via NEP infrastructure on the adjacent NZT site including the high pressure compression facility and the CO_2 export pipeline. The DCO application for NZT is due to be determined by the SoS by 10th May 2023.

1.4 Purpose of Scoping

1.4.1 The scoping phase of the EIA process provides a framework for identifying potential significant environmental effects which may arise as a result of the Proposed Development, and distinguishing the priority issues to be addressed at the assessment stage (i.e. within the ES). It also identifies those matters, where possible, which do not need to be assessed in detail and can be 'scoped out'.

1.4.2 The Scoping Report facilitates early pre-application engagement with key statutory consultees and stakeholders on the Proposed Development, as well as the proposed structure, methodology and content of the EIA.

1.4.3 This Scoping Report has been prepared in accordance with the relevant legislative provisions and associated Advice Notes (published by PINS).

1.4.4 Table 1-1, presents a list of information that should be included in a request for an EIA scoping opinion, as prescribed by Regulation 10(3) of the EIA Regulations and as set out in Paragraph 4.2 (and the associated Insert 2) of Advice Note Seven 'Environmental Impact Assessment: Preliminary Environmental Information and Environmental Statements' (PINS, 2020). Table 1-1 signposts to where that information is provided within this Scoping Report.

Table 1-1: Information Required for a Request for a Scoping Opinion

DESCRIPTION OF INFORMATION REQUIRED (REGULATION 10(3))	SUPPLEMENTARY DESCRIPTIONS (REGULATION 8(3))	SECTION IN SCOPING REPORT WHERE INFORMATION PRESENTED
A plan sufficient to identify the land	-	EIA Scoping Figures 1-8 (Appendix A)
A description of the proposed development, including its location and technical capacity	A description of the physical characteristics of the whole development; and a description of the location of the development, with particular regard to the environmental sensitivity of geographical areas likely to be affected.	Section 1-4 Section 2, 3 and 6
An explanation of the likely significant effects of the development on the environment	…resulting from: the expected residues and emissions and the production of waste, where relevant; and the use of natural resources, in particular soil, land, water and biodiversity.	Section 6 Section 3 and 6
Such other information or representations as the person making the request may wish to provide or make	-	See Table 1-2

1.4.5 PINS Advice Note Seven (PINS, 2020) recommends the information is presented in the form of a Scoping Report that includes the information required by the EIA Regulations (as presented in Table 1-1) together with more detailed/additional information as presented in Table 1-2.

Table 1-2: Information to be Provided in the Scoping Report

DESCRIPTION OF INFORMATION REQUIRED	SECTION IN SCOPING REPORT WHERE THE INFORMATION IS PRESENTED
The Proposed Development	

DESCRIPTION OF INFORMATION REQUIRED	SECTION IN SCOPING REPORT WHERE THE INFORMATION IS PRESENTED
An explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development e.g. design parameters.	Section 1-4
Referenced plans presented at an appropriate scale to convey clearly the information and all known aspects associated with the Proposed Development.	EIA Scoping Figures (Appendix A)
EIA Approach and Topic Areas	
An outline of the reasonable alternatives considered and the reasons for selecting a preferred option.	Section 4 (Alternatives)
A summary table depicting each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues.	Section 8 (Summary)
A detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided.	Section 6 (Scope of the Assessment for each environmental topic) Section 8 (Summary)
Results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters.	Section 2 (Description of the existing environment) Section 6 (Baseline Conditions and Scope of the Assessment for each environmental topic)
Aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect (e.g. criteria for determining sensitivity and magnitude).	Section 6 (Baseline Conditions and Scope of the Assessment for each environmental topic) and Section 7 (EIA Process)
Any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects.	Section 6 (Baseline Conditions and Scope of the Assessment for each environmental topic) and Section 7(EIA Process)
Information Sources	
References to any guidance and best practice to be relied upon.	Section 6 (Scope of the Assessment for each environmental topic)
Evidence of agreements reached with consultation bodies (for example the statutory nature conservation bodies or local authorities).	Section 7 (EIA Process-See Table 7-1)
An outline of the structure of the proposed ES.	Section 7 (EIA Process)

Source: Advice Note Seven: Environmental Impact Assessment: Preliminary Environmental Information and Environmental Statements, June 2020 (version 7).

1.5 Structure of this Report

1.5.1 The remainder of this report is structured as follows:

- Section 2 – Description of the Existing Environment: provides a description of the site and the surrounding area, together with any particular potentially significant environmental sensitivities/receptors within the vicinity of the Proposed Development Site;
- Section 3 – Proposed Development: outlines the key elements (including those likely to have a significant environmental effect) of the Proposed Development, the infrastructure to be developed and the function of the operational plant;
- Section 4 – Consideration of Alternatives: details the alternatives that have been considered during development of the Proposed Development design;
- Section 5 – Planning Policy and Need: identifies the key documents relating to national and local planning policy in the area, together with a summary of some of the principal planning policies or provisions as relevant to the Proposed Development;
- Section 6 – Potentially Significant Environmental Effects: provides a discussion of how the Proposed Development may interact with the different aspects of the receiving environment, together with a description of the proposed assessment methodologies, guidance and best practice to be adopted for the EIA of the Proposed Development (or, as appropriate, its design) and initial consideration of potential features of the Proposed Development or any measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment;
- Section 7 – Environmental Impact Assessment Process: provides an overview of the approach to be taken in the EIA and outline structure for the proposed ES; and
- Section 8– Summary and Matters to be Scoped Out: provides a summary of the EIA Scoping Report, the issues proposed to be scoped out of the EIA and the reasoning.

1.5.2 The following figures are included at Appendix A:

- Figure 1: Site Location Plan;
- Figure 2: Proposed Development Site Boundary (including location of Main Site A - Foundry);
- Figure 2a: Proposed Development Site Boundary (including location of Main Site B - RBT);
- Figure 3: Parts of the Proposed Development Site (Main Site A - Foundry);
- Figure 3a: Parts of the Proposed Development Site (Main Site B – RBT);
- Figure 4: CO_2 Export Corridor (Main Site A - Foundry);

- Figure 4a: CO_2 Export Corridor (extension required for Main Site B - RBT);
- Figure 5: Hydrogen Pipeline Corridor (Main Sites A - Foundry);
- Figure 5a: Hydrogen Pipeline Corridor (extension required for Main Site B - RBT)
- Figure 6: Natural Gas Connection Corridor (Main Site A – Foundry);
- Figure 6a: Natural Gas Connection Corridor (extension required for Main Site B – RBT);
- Figure 7: Electrical Connection Corridor (Main Site A – Foundry);
- Figure 7a: Electrical Connection Corridor (extension required for Main Site B – RBT);
- Figure 8: Water Connections Corridor (Main Site A – Foundry);
- Figure 8a: Water Connections Corridor (extension required for Main Site B – RBT);
- Figure 9: Other Gases Connection Corridor (O_2 and N_2) (Main Site A- Foundry);
- Figure 9a: Other Gases Connection Corridor (O_2 and N_2) (Main Site B- RBT);
- Figure 10: Environmental Constraints within 1 km of the Proposed Development Site Boundary;
- Figure 11: Water Constraints within 5 km of the Proposed Development Site Boundary;
- Figure 12: Ecological Constraints within 1 km of the Proposed Development Site Boundary;
- Figure 13: Statutory Designated Ecological Sites within 15 km of the Proposed Development Site Boundary;
- Figure 14: Major Accidents and Disasters Receptors within 5 km of the Proposed Development Site Boundary; and
- Figure 15: Other Developments to be Considered in the Cumulative Impact Assessment.

1.5.3 Any baseline data from other sources presented on Figures 1-15 in Appendix A is based on the information currently available from various data sources (see notes section on the individual Figures) and will be updated where required to inform the assessments as the EIA progresses.

2.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

2.1 The Proposed Development Site

2.1.1 The Main Site will be located either at 'The Foundry' site, within the Teesworks development site, or at RBT, to the immediate west of the Foundry.

2.1.2 The Proposed Development Site is located primarily within the administrative boundaries of Redcar and Cleveland Borough Council (RCBC) and Stockton-on-Tees Borough Council (STBC). The Hydrogen Pipeline Corridor extends further north-west to include land within the administrative boundary of Hartlepool Borough Council (HBC). For the purposes of this report, the Proposed Development Site is split into distinct areas. These are summarised below and illustrated on Figures 3-9 in Appendix A.

- The Main Site (whether Main Site A or B) which will be the location of the Production Facility together with the associated carbon capture and compression facilities and ancillary infrastructure.
- CO_2 Export Corridor: CO_2 captured from the process will be compressed to medium pressure at the Main Site and transported at a Maximum Allowable Operating Pressure (MAOP) of up to 28 barg[1] in a pipeline of up to 22" diameter to feed into the NEP CO_2 gathering system. CO_2 in dense-phase will then be exported off shore for geological storage offsite at the Endurance Store in the Southern North Sea using NEP infrastructure.
- Hydrogen Pipeline Corridor: Gaseous phase hydrogen pipeline network for the purpose of connecting to potential offtakers at various industrial installations across the Tees Valley. This pipeline system will be at up to 24" diameter and with a MAOP of up to 49 barg.
- Natural Gas Connection Corridor: Pipeline to connect the Production Facility to gas supply infrastructure.
- Other Gases Connection Corridor: Pipelines required for the transportation of compressed O_2 and N_2 from local sources for use in the H_2 production process.
- Electrical Connection Corridor: To provide electrical power for the Production Facility via a connection to the National Grid Network, either via private connection to Teesworks or to Northern Power Grid (NPG).
- Water Connections Corridor: Connections are required for water supply and discharge from/to the Production Facility.

[1] barg is the unit for the measurement of gauge pressure given by absolute pressure minus atmospheric pressure.

2.1.3 Further information regarding the above is provided in Section 3: The Proposed Development.

2.1.4 The Proposed Development Site encompasses an area of approximately 1,746 hectares (ha) and is indicative at this stage. The land required for the Proposed Development will be subject to appraisal, refinement, and final site selection as the preparation of the Application progresses. The final layout that will be incorporated within the Proposed DCO Boundary will be determined through ongoing studies of potential constraints and discussions with relevant stakeholders.

2.1.5 Any existing structures currently located within the Main Site A are expected to be demolished (by others under a separate consent) prior to commencement of works associated with the Proposed Development. As such, if Main Site A were to be selected, demolition works would not form part of the Proposed Development, and would not be assessed as part of the EIA.

2.1.6 There are structures present on Main Site B which would require demolition works. It is expected that these structures would be demolished (by others under a separate consent) prior to commencement of works associated with the Proposed Development, however, the Applicant may have to undertake these works. As such, if Main Site B were to be selected, demolition works would form part of the Proposed Development, and would be assessed as part of the EIA.

2.2 Site History

Main Site A – The Foundry

2.2.1 The history of Main Site A is summarised in Table 2-1.

Table 2-1: Main Site A History

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE A	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
1856-1857 (1:10,560)	The majority of Main Site A is underlain by Bran Sands in the West, associated with the River Tees and Tees Estuary.	Adjacent to Main Site A, the Darlington and Saltburn Branch railway line runs in a broadly north to south direction. The trainline then runs easterly to a village which in later maps is called Warrenby. The south Gare Breakwater runs in a spur north from Main Site A. Adjacent to the east is marshland and agricultural fields.
1859 -1861 (1:10,560)	No significant change.	No significant change, no data available for eastern extent.
1893 (1:10,560) (1:2,250)	Two tramways cross the northern portion of Main Site A. One originates at Redcar Jetty, travels in a north-western direction, and	Redcar Jetty tramway leads into the adjacent Main Site B to the west and runs through its centre.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE A	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
	exits the Site to the south-east. Another tramway crosses Redcar Jetty tramway and travels in a south-easterly direction. Both are understood to lead to an ironworks located adjacent to the eastern boundary of Main Site A.	
1895 & 1898 (1:10,560)	No significant change.	Numerous sidings adjacent east and north of Main Site A have been constructed associated with the Saltburn Branch railway line. A Coastguard Station and South Pier Lighthouse have been constructed on the South Gare Breakwater.
1915 (1:10,560) (1:2,250)	No significant change.	Mapping shows Coatham ironworks, located adjacent to the eastern boundary of Main Site A. Beyond that, to the east, is wider industrial development including a slag works, ironworks and tarmacadam works.
1920 & 1923 (1:10,560)	No significant change.	No significant change. Large portions of the mapping are missing.
1924 Ariel Photography	Photography shows industrial infrastructure in the north of the site, associated with the Redcar Iron and Steel works.	Coatham Ironworks extends beyond the eastern boundary of Main Site A. There is surface water and marshland either side of the jetty in Main Site B site, to the immediate west of Main Site A.
1929 OS Mapping	No significant change.	Coatham Ironworks is renamed Redcar Iron and Steel Works. The Slag and Tarmacadam expanded, along with the associated railway sidings to the north-east of Main Site A.
1930 (1:10,560)	No significant change.	A portion of the Redcar iron and steel works is shown to have been constructed. This can only be distinguished by moving forward in mapping time (1938).
1938 (1:10,560)	No significant change.	The sidings associated with the Saltburn Branch railway line now serve the constructed Redcar iron and steel works. To the east Dormanstown has been constructed, including a residential

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE A	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
		housing area with a sports ground and allotments.
1946 Ariel Photography	Photography shows the industrial infrastructure associated with the steel works to still be present.	No significant change.
1951-1955 (1:10,000)	No significant change.	Dormanstown continues to expand, with further residential and industrial buildings built to the far east.
1970-1978 (1:10,000)	Railway infrastructure and road networks appear to have been constructed.	The Teesport refinery has been constructed approximately 1 km to the south of Main Site A.
1981 British Steel Corporation Site Layout Plan	Industrial infrastructure is present on-site including a blast furnace, two pumphouses, four oil tanks and butane and nitrogen storage compounds.	Area not shown by mapping.
1982 British Steel Corporation Site Layout Plan	In the north-east of Main Site A is a power station, blast furnace gasholder, coke screenhouse, settling pond and slag pits.	Area not shown by mapping.
1981-1985 (1:10,000)	The Redcar Steelworks has been constructed on site. Numerous buildings including tanks/ cooling towers and conveyors have been constructed.	The Saltburn Branch railway line has been realigned.
1986 (1:10,000)	No significant change.	A large reservoir/lake is located approximately 300 m south of Main Site A.
1991-1995 (1:10,000)	No significant change.	A series of square ponds have been constructed to the south of Main Site A.
1995 British Steel Corporation Site Layout Plan	The plan shows a blast furnace, water tanks, a thickener tank, a boiler house, slag pits and a cooling tower on Main Site A.	Area not shown by mapping.
1997 British Steel Corporation Site Layout Plan	Numerous tanks present.	Area not shown by mapping.
1999 Ariel Photography	No significant change.	The large reservoir/lake is still present, located approximately 300 m south of Main Site A.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE A	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
2000 (Google Earth, 2023)	No significant change.	Within Main Site B, large stockpiles are present, as well as various buildings and a lorry park.
2000-2021 (1:10,000)	No significant change.	Teesport refinery, located approximately 1 km to the south of Main Site A, appears to have been dismantled.
2015 Ariel Photography	Conveyors, tanks and other industrial infrastructure are in the north of Main Site A. There is surface water across Main Site A, and a pond in the north-east. Most of the infrastructure in the southern half of Main Site A is no longer present.	Two ponds are located approximately 30 m and 115 m north of Main Site A respectively.
2022 (Google Earth, 2023)	The majority of the southern half of Main Site A is vacant, with various small buildings present in the south western corner and conveyor structures remaining along the southern, eastern and western boundaries. Above-ground conveyors are still present in the northern and central parts of Main Site A. In the north, industrial infrastructure and tanks are still present, associated with the Redcar Steel works.	Large stockpiles are present on Main Site B, to the immediate west of Main Site A.
2023 (1:10,000)	Demolition of the buildings and infrastructure on Main Site A is ongoing.	Demolition of the buildings and infrastructure on Main Site B is ongoing.

Source: Envirocheck Report (284970768_1_1) (2021), Groundsure Report GS-9167761 (2022), Groundsure Report GS-9366847 (2023), National Library of Scotland (2023), Britain from Above (2023), Historic England (2015), Google Earth (2023).

Main Site B – RBT

2.2.2 The history of Main Site B is summarised in Table 2-2, below.

Table 2-2: Main Site B History

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE B	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
1857 (1:10,560)	Main Site B is located within the Bran Sands area.	The Tees estuary is located approximately 225 m west of Main Site B.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE B	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
1893 (1:10,560) (1:2,250)	Redcar jetty tramway runs through the centre of Main Site B.	Redcar Wharf is located approximately 160 m southwest of Main Site B, where the Redcar Jetty tramway terminates. Several beacons and buoys are located in the Tees estuary, to the west of Main Site B. Coatham Sands is located approximately 0.5 km to the north-east of Main Site B. Two tramways cross the northern portion of the Foundry site. One originates at Redcar Jetty, travels in a north-western direction, and exits the Site to the south-east. Another tramway crosses Redcar Jetty tramway and travels in a south-easterly direction. Both are understood to lead to an ironworks located approximately 1 km south-east of Main Site B.
1897 (1:10,560) (1:2,250)	No significant change.	Fifth Buoy Lighthouse is located approximately 500 m to the west of Main Site B.
1915 (1:10,560) (1:2,250)	No significant change.	A travelling crane is located at Redcar Wharf, approximately 160 m south-west of Main Site B. An ironworks (renamed Coatham ironworks) is located approximately 1.5 km east of Main Site B. Beyond that, approximately 1.7 km to the east, is wider industrial development including a slag works, ironworks and tarmacadam works.
1924 Aerial Photography	A jetty is located in the centre of Main Site B, with surface water and marshland on either side.	Various other railways/ tramways split off from the original tramway and appear to lead into a large building adjacent to the eastern boundary of Main Site B. A slag and tarmacadam works, and Warrenby slag works, are located to the north-east of Main Site B alongside a reservoir and a pumping station.
1927 – 1929 OS Mapping	No significant change.	Coatham Ironworks located approximately 1.5 km to the east (renamed Redcar Iron and Steel works) expanded, along with associated railway sidings to the north-east. Numerous tanks, sidings, railways lines, buildings, water towers and metre house are related to the iron and steel works are present. A sand pit is located approximately 400 m east of Main Site B.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE B	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
1929 (1:10,560) (1:2,250)	No significant change.	Another travelling crane is located at Redcar Wharf, approximately 160 m south-west of Main Site B.
1938 OS Mapping	No significant change.	No significant change.
1944 Aerial Photography	Main Site B comprised possible sand/ marshland in the north and south, separated by the jetty and tramway.	Various buildings associated with the slag works are present to the east of Main Site B.
1952 OS Mapping	No significant change.	Six tanks are located approximately 1 km to the south-east of Main Site B. There are numerous drains and ponds along the eastern boundary of the adjacent Foundry site (Main Site A), within marshland, and a pumping station is situated from approximately 1 km to the north-east of Main Site B.
1953 OS Mapping	No significant change.	Two slag heaps were identified adjacent to the north-east corner of the Foundry site and a saltmarsh is located along the eastern boundary of the Foundry site.
1954 (1:10,560) (1:2,250)	Two small buildings are located along Redcar jetty, in the centre of Main Site B. Significant development of the steelworks occurred in the northeast of Main Site B, adjacent to Redcar Jetty, and numerous roadways, ramps, buildings, two conveyors, a platform, and a separator were constructed.	Buildings, roadways and ramps lead from the iron and steel works into Main Site B from the east.
1968 (1:10,560) (1:2,250)	No significant change.	A dismantled tramway is located approximately 600 m to the east of Main Site B. A spoil heap is situated approximately 100 m to the north-east of Main Site B.
1972 OS Mapping	Site not shown by mapping.	To the south of Main Site B, the wider area is referred to as South Teesside Works, Redcar. Active workings are shown to the south-east and a railway line runs parallel to the southern boundary of Main Site B.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE B	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
1980 (1:10,000) (1:2,250)	Main Site B is now shown as constructed on reclaimed land adjacent to the wider Redcar Steelworks. Numerous lighting towers are located within it. Seven conveyors stretch across the central and southern areas of it.	Redcar Wharf, located approximately 160 m south-west of Main Site B, expanded. Numerous conveyors, lighting towers and travelling cranes were constructed in the immediate vicinity. The main Redcar Steelworks is located to the immediate east of Main Site B, which includes numerous embankments, conveyors, tanks, travelling cranes, chimneys and buildings. An terminal containing numerous tanks, jetties and a laboratory is located approximately 700 m south-west of Main Site B, on the northern bank of the Tees estuary.
1981 British Steel Corporation Site Layout Plan	Site not shown by mapping.	To the east of Main Site B, within the Foundry site, there is a blast furnace, two pumphouses, four oil tanks and butane and nitrogen storage compounds.
1982 British Steel Corporation Site Layout Plan	Site not shown by mapping.	To the north east of the adjacent Foundry site, there is a power station, blast furnace gasholder, coke screenhouse, settling pond and slag pits.
1993 (1:10,000) (1:2,500)	No significant change.	A pipe tunnel runs from Dabholm Gut, located approximately 700 m south of Main Site B, across the Tees estuary, to the oil terminal/ refinery on its northern bank. Minor expansions to Teesworks were undertaken to the east of Main Site B.
1995 British Steel Corporation Site Layout Plan	Site not shown by mapping.	To the east of Main Site B, within the adjacent Foundry site, there is a blast furnace, as well as water tanks, a thickener tank, a boiler house, slag pits and a cooling tower.
1997 British Steel Corporation Site Layout Plan	Site not shown by mapping.	The Foundry North, adjacent to Main Site B, included numerous tanks.
1999 (Aerial photograph)	Development occurred in the north of Main Site B, including possible stockpiling.	A large reservoir/ lake is located approximately 300 m south of Main Site B.
2000 (Google Earth, 2023)	Main Site B comprised large stockpiles in the north, with various buildings still present,	No significant change.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE B	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
	and a possible lorry park. Stockpiles are present in the southern half of Main Site B.	
2001 (1:10,000)	A small pond/ lake is present in north-western corner of Main Site B.	A tip is located approximately 650 m north-east of Main Site B, near a group of small ponds. Various tanks and buildings are located approximately 700 m south of Main Site B, associated with an oil refinery.
2007 (Aerial Photography)	No significant change.	No significant change.
2010 (1:10,000)	Three small buildings were constructed in the centre of Main Site B.	Small expansions were undertaken to Teesworks, east of Main Site B, including the construction of roadways. The oil refinery located approximately 700 m south-east of Main Site B also expanded, including the construction of new tanks and two new pipelines. A tip is located approximately 500 m to the north of Main Site B, within Coatham Dunes, close to eight small ponds.
2015 (Aerial Photography)	No significant changes shown on Groundsure Arial photography, which covers the south of Main Site B. Aerial photography shows that large coal and ore stockpiles and above-ground conveyor structures that extend across the whole of Main Site B are still present. There is a small pond in the north-western corner of Main Site B, within a large, roughly vegetated area. The majority of Main Site B is covered with large puddles and surface water. The railway line through the centre of Main Site B appears to be abandoned. The buildings on-site are still present.	Redcar Steelworks appears to no longer be in use. Various industrial developments are present adjacent to the River Tees, to the west of Main Site B, with nearby cars suggesting that they are in-use.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE B	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
2019 (Aerial photograph)	No significant change.	No significant change.
2021 (Aerial photograph)	No significant change.	No significant change.
2022 (Google Earth, 2023)	Main Site B comprised various large stockpiles, conveyors and associated structures. The small pond is still present in the north-west of Main Site B. This is understood to be representative of the current site layout.	The pond adjacent to the north-east corner of Main Site B is no longer present.
2023 (1:10,000)	Demolition of conveyors and buildings on Main Site B is ongoing.	Demolition works are ongoing in the area surrounding Main Site B.

Sources: Groundsure Report GS-9167761 (2022), Groundsure Report GS-9366847 (2023), National Library of Scotland (2023), Britain from Above (2023), Historic England (2015), Google Earth (2023).

2.3 Environmental Receptors

2.3.1 Several environmental receptors have been identified within the vicinity of the Proposed Development Site (pursuant to study areas discussed in section 6). Each of these are detailed below under each environmental discipline (note this is not intended to be an exhaustive list at this stage) and further detail where required is presented in the topic sections included within Section 6: Potentially Significant Environmental Effects. All distances are given as the shortest distance between the receptor and the closest point of the relevant part of the Proposed Development Site (see Figures 3-13, Appendix A).

Main Site A – Foundry

2.3.2 Main Site A comprises approximately 91 ha of land. It is not anticipated that all of this land will be required but it is presented as a worst-case scenario area until the layout of the Proposed Development is confirmed within this area.

2.3.3 Main Site A comprises former industrial land that was used for steel making production, including a mix of industrial buildings. As of February 2023, much of the site infrastructure including industrial buildings and overhead pipes are either demolished or in the process of being dismantled. A combination of hardstanding and road networks remain on Main Site A, surrounded by informal vegetation (primarily grass), with occasional shrubs and small trees.

2.3.4 The topography of Main Site A is relatively flat, with typical ground levels of between 6-8 m above ordnance datum (AOD).

2.3.5 The following environmental receptors have been identified in the vicinity of Main Site A.

Residential

2.3.6 Main Site A is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 1.3 km east of Main Site A, in Warrenby.

2.3.7 Dormanstown is located approximately 1.3 km to the south-east of Main Site A, and Redcar is located approximately 2.6 km to the east of Main Site A.

Traffic and Transport

2.3.8 Access to Main Site A during the construction phase for Heavy Goods Vehicle (HGV) construction traffic is likely to be via the existing Teesworks access road from the A1085, via the former Redcar Steelworks entrance. This route will also be used during operation for staff and other site traffic.

2.3.9 The Tees Valley Line, a passenger railway, runs approximately 0.9 km south-east of Main Site A. The mothballed Redcar British Steel railway station is located approximately 1.2 km south-west of Main Site A.

2.3.10 There are no Public Rights of Way (PRoWs) within Main Site A. The England Coast Path, a National Trail, runs approximately 1.3 km east of Main Site A. The Teesdale Way Long Distance Route runs adjacent to Main Site A along its northern boundary. There are no other National Trails within 5 km of Main Site A.

2.3.11 Whilst Main Site A is located within access land in the England Coastal Margin defined by the Countryside and Rights of Way (CRoW) Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.12 Within 15 km of Main Site A there are:

- Three Special Protection Areas (SPAs):
  - Teesmouth and Cleveland Coast SPA, immediately north of Main Site A;
  - North York Moors SPA, located approximately 12.2 km south-east of Main Site A; and
  - Northumbria Coast SPA, located approximately 13.5 km north-west of Main Site A.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, immediately north of Main Site A; and

  - Northumbria Coast Ramsar Site, located approximately 13.5 km north-west of Main Site A.

- Two Special Areas of Conservation (SACs):
  - North York Moors SAC, located approximately 12.2 km south-east of Main Site A; and
  - Durham Coast SAC, located approximately 13.5 km north-west of Main Site A.
- Two National Nature Reserves (NNRs):
  - Teesmouth NNR, located approximately 1.6 km west of Main Site A; and
  - Durham Coast NNR, located approximately 12.5 km north-west of Main Site A.

2.3.13 There are no proposed Ramsar Sites or potential SPAs within 15 km of Main Site A.

2.3.14 There is one Site of Special Scientific Interest (SSSI) within 5 km of Main Site A, that being Teesmouth and Cleveland Coast SSSI, adjacent to Main Site A.

2.3.15 There is one Local Nature Reserve (LNR) within 5 km of Main Site A, that being Seaton Dunes and Common LNR, located approximately 3.1 km north-west of Main Site A.

Hydrology/Flood Risk

2.3.16 The River Tees (a Main River) discharges to the North Sea via the Tees Estuary at Tees Mouth and is located approximately 0.9 km west of Main Site A. Other watercourses within 1km of Main Site A include:

- Dabholm Gut[2], a man-made tidal inlet, located approximately 0.7km south of Main Site A;
- The Fleet, located approximately 0.8 km east of Main Site A; and
- The Mill Race, located approximately 0.9 km south-east of Main Site A.

2.3.17 The Environment Agency 'Flood map for planning' indicates that the whole of Main Site A is located within Flood Zone 1 that is defined as, "*land having a less than 0.1% annual exceedance probability (AEP) of river or sea flooding*".

Geology and Hydrogeology

2.3.18 Main Site A is underlain by a sequence of Made Ground, Tidal Flat Deposits and Glacial Till (Boulder Clay)/Glacio-lacustrine deposits, underlain by Triassic Mercia

[2] Also referenced on early mapping sources as Dabholm Cut. For the purposes of this report, this watercourse/ feature will be referred to consistently as Dabholm Gut. It is fed by a combined discharge from number of watercourses and the permitted discharge from Bran Sands WwTW.

Mudstone bedrock in the north-west, Triassic Penarth Formation in the centre and Jurassic Redcar Mudstone Formation in the south-east.

2.3.19 Main Site A is located over 5 km south-east of the nearest aquifer Source Protection Zone (SPZ). There are no Nitrate Vulnerable Zones (NVZs), Drinking Water Protected Areas, Drinking Water Safeguard Zones (Surface Water and Groundwater) or groundwater, potable water or surface water abstraction licences located within 1 km of Main Site A.

Cultural Heritage

2.3.20 There are no designated heritage assets within Main Site A.

2.3.21 There are 59 listed buildings within 5 km of Main Site A. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 1.3 km east of Main Site A, at Warrenby.

2.3.22 There are four Conservation Areas within 5 km of Main Site A:

- Coatham Conservation Area, Redcar, located approximately 2.5 km east of Main Site A;
- Kirkleatham Conservation Area, located approximately 3.8 km south-east of Main Site A;
- Seaton Conservation Area, located approximately 4.6 km north-west of Main Site A; and
- Wilton Conservation Area, located approximately 5 km south-east of Main Site A.

2.3.23 There are no scheduled monuments, world heritage sites, registered parks and gardens, registered battlefields or heritage coasts within 5 km of Main Site A.

Landscape

2.3.24 Main Site A is located within the Tees Lowlands National Character Area (NCA).

2.3.25 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including Main Site A and the surrounding area.

Main Site B – RBT

2.3.26 Main Site B comprises approximately 60 ha of land. It is not anticipated that all of this land will be required but it is presented as a worst-case scenario area until the layout of the Proposed Development is confirmed within this area.

2.3.27 Main Site B comprises former industrial land, including a mix of industrial buildings and some small areas of grassland. Much of the site infrastructure is still in place, including hardstanding and road networks.

2.3.28 The topography of Main Site B is relatively flat, with typical ground levels of approximately 2-7 m AOD. Ground levels for the majority of Main Site B are

approximately 5-7 m AOD; the north-western corner of Main Site B is lower at approximately 2 m AOD.

2.3.29 The following environmental receptors have been identified in the vicinity of Main Site B.

Residential

2.3.30 Main Site B is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 2.2 km east of Main Site B in Warrenby.

2.3.31 Dormanstown is located approximately 3 km to the south-east of Main Site B, and Redcar is located approximately 4.2 km to the east of Main Site B.

Traffic and Transport

2.3.32 Access to Main Site B during the construction phase for HGV construction traffic is likely to be the same as that for Main Site A, i.e. via the existing access road from the A1085, via the former Redcar Steelworks entrance. This route will also be used during operation for staff and other site traffic.

2.3.33 The Tees Valley Line railway runs approximately 1.8 km south-east of Main Site B. The mothballed Redcar British Steel railway station is located approximately 2.1 km south-west of Main Site B.

2.3.34 There are no PRoWs within Main Site B. The Teesdale Way long distance route runs approximately 0.4 km north-east of Main Site B. The England Coast Path National Trail runs approximately 2.2 km east of Main Site B. There are no other National Trails within 5 km of Main Site B.

2.3.35 Whilst Main Site B is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.36 Within 15 km of Main Site B there are:

- Three Special Protection Areas (SPAs):
  - Teesmouth and Cleveland Coast SPA, adjacent to Main Site B;
  - North York Moors SPA, located approximately 12.7 km south-east of Main Site B; and
  - Northumbria Coast SPA, located approximately 13.1 km north-west of Main Site B.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site adjacent to Main Site B; and

  - Northumbria Coast Ramsar Site, located approximately 13.1 km north-west of Main Site B.

- Two Special Areas of Conservation (SACs):
  - North York Moors SAC, located approximately 12.7 km south-east of Main Site B; and
  - Durham Coast SAC, located approximately 13.1 km north-west of Main Site B.
- Two National Nature Reserves (NNRs):
  - Teesmouth NNR, located approximately 0.8 km west of Main Site B; and
  - Durham Coast NNR, located approximately 12 km north-west of Main Site B.

2.3.37 There are no proposed Ramsar Sites or potential SPAs within 15 km of Main Site B.

2.3.38 There is one SSSI within 5 km of Main Site B, that being Teesmouth and Cleveland Coast SSSI, adjacent to Main Site B.

2.3.39 There is one LNR within 5 km of Main Site B, that being Seaton Dunes and Common LNR, located approximately 2.3 km north-west of Main Site B.

Hydrology/ Flood Risk

2.3.40 The River Tees (Tees Estuary) at Tees Mouth is located approximately 75 m west of Main Site B at its closest point. Other watercourses within 1 km of Main Site B include:

- Dabholm Gut, located approximately 0.88 km south of Main Site B;
- The Fleet, located approximately 1.7 km east of Main Site B; and
- The Mill Race, located approximately 2.0 km south-east of Main Site B.

2.3.41 The Environment Agency 'Flood map for planning' indicates that the whole of Main Site B is located within Flood Zone 1 that is defined as, "*land having a less than 0.1% annual exceedance probability (AEP) of river or sea flooding*".

Geology and Hydrogeology

2.3.42 Main Site B is underlain by a sequence of Made Ground, Tidal Flat Deposits, Glacial Till (Boulder Clay)/Glacio-lacustrine Deposits underlain by the Triassic Mercia Mudstone Group bedrock.

2.3.43 Main Site B is located over 5 km south-east of the nearest SPZ. There are no NVZs, Drinking Water Protected Areas, Drinking Water Safeguard Zones (Surface Water and Groundwater) or groundwater, potable water or surface water abstraction licences located within 1 km of Main Site B.

Cultural Heritage

2.3.44 There are no designated heritage assets within Main Site B.

2.3.45 There are 40 listed buildings within 5 km of Main Site B. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 2.2 km east of Main Site B in Warrenby.

2.3.46 There are three Conservation Areas within 5 km of Main Site B:

- Coatham Conservation Area, Redcar, located approximately 3.3 km east of Main Site B;
- Seaton Conservation Area, located approximately 3.9 km north-west of Main Site B; and
- Kirkleatham Conservation Area, located approximately 4.7 km south-east of Main Site B.

2.3.47 There are no scheduled monuments, world heritage sites, registered parks and gardens, registered battlefields or heritage coasts within 5 km of Main Site B.

Landscape

2.3.48 Main Site B is located within the Tees Lowlands NCA.

2.3.49 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including Main Site B and the surrounding area.

CO_2 Export Corridor – Main Site A

2.3.50 There are two CO_2 Export Corridor options for Main Site A; only one will be required.

2.3.51 The first CO_2 Export Corridor is adjacent to Main Site A and links to NEP infrastructure on the adjacent NZT site. It comprises approximately 4 ha at present, but this will be refined in due course.

2.3.52 An alternative CO_2 Export Corridor option would connect into Main Site A at a location along its southern boundary and then route to the south of the NZT site. Part of this corridor is also being considered as an option for Main Site B. It comprises approximately 11 ha at present, but this will also be subject to refinement if carried forward as the preferred option. The following environmental receptors have been identified in the vicinity of the CO_2 Export Corridors for Main Site A.

Residential

2.3.53 The CO_2 Export Corridors are generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 0.8 km east of the CO_2 Export Corridors in Warrenby.

2.3.54 Dormanstown is located approximately 1.1 km to the south-east of the CO_2 Export Corridors, and Redcar is located approximately 2.4 km to the-east of the CO_2 Export Corridors.

Traffic and Transport

2.3.55 The Tees Valley railway line runs approximately 0.5 km south-east of the CO_2 Export Corridors.

2.3.56 There are no PRoWs within or adjacent to the CO_2 Export Corridors. The Teesdale Way runs approximately 0.5 km north-east of the CO_2 Export Corridors. The England Coast Path runs approximately 0.8 km north-east of the CO_2 Export Corridors. There are no other National Trails within 5 km of the CO_2 Export Corridors.

2.3.57 Whilst the CO_2 Export Corridors are located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.58 Within 15 km of the CO_2 Export Corridors there are:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, approximately 0.5 km north of the CO_2 Export Corridors;
  - North York Moors SPA, located approximately 11.7 km south-east of the CO_2 Export Corridors; and
  - Northumbria Coast SPA, located approximately 14.6 km north-west of the CO_2 Export Corridors.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, located approximately 0.5 km north of the CO_2 Export Corridors; and
  - Northumbria Coast Ramsar Site, located approximately 14.6 km north-west of the CO_2 Export Corridors.
- Two SACs:
  - North York Moors SAC, located approximately 11.6 km south-east of the CO_2 Export Corridors; and
  - Durham Coast SAC, located approximately 14.6 km north-west of the CO_2 Export Corridors.
- Two NNRs:
  - Teesmouth NNR, located approximately 2.7 km west of the CO_2 Export Corridors; and
  - Durham Coast NNR, located approximately 13.6 km north-west of the CO_2 Export Corridors.

2.3.59 There are no proposed Ramsar Sites or potential SPAs within 15 km of the CO_2 Export Corridors.

2.3.60 There is one SSSI within 5 km of the CO_2 Export Corridors, Teesmouth and Cleveland Coast SSSI, located approximately 0.5 m north of the CO_2 Export Corridors.

2.3.61 There is one LNR within 5 km of the CO_2 Export Corridors, Seaton Dunes and Common LNR, located approximately 3.8 km north-west of the CO_2 Export Corridors.

Hydrology/ Flood Risk

2.3.62 The Tees Estuary at Tees Mouth is located approximately 1.8 km west of the CO_2 Export Corridors. Other watercourses within 1 km of the CO_2 Export Corridors include:

- The Fleet, located approximately 80 m east of the CO_2 Export Corridors;
- The Mill Race, located approximately 0.4 km south-east of the CO_2 Export Corridors;
- Ash Gill, located approximately 0.5 km south-east of the CO_2 Export Corridors;
- Dabholm Gut, located approximately 0.8 km south of the CO_2 Export Corridors; and
- Dabholm Beck, located approximately 0.9 km south of the CO_2 Export Corridors.

2.3.63 The Environment Agency 'Flood map for planning' indicates that the CO_2 Export Corridors are wholly located within Flood Zone 1 that is defined as, "*land having a less than 0.1% AEP of river or sea flooding*".

Geology and Hydrogeology

2.3.64 A review of the publicly available British Geological Survey (BGS) borehole records and geological maps (BGS, 2022) indicate that the CO_2 Export Corridors are underlain by a sequence of Made Ground, Tidal Flat Deposits and mudstones of the Redcar Mudstone Formation.

2.3.65 There are no SPZs, NVZs, Drinking Water Protected Areas, Drinking Water Safeguard Zones (Surface Water and Groundwater) or groundwater, potable water or surface water abstraction licences within 1 km of the CO_2 Export Corridors.

Cultural Heritage

2.3.66 There are no designated heritage assets within the CO_2 Export Corridors.

2.3.67 There are 83 listed buildings within 5 km of the CO_2 Export Corridors. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 0.8 km east of the CO_2 Export Corridors in Warrenby.

2.3.68 There are four Conservation Areas within 5 km of the CO_2 Export Corridors:

- Coatham Conservation Area, Redcar, located approximately 1.9 km east of the CO_2 Export Corridors;
- Kirkleatham Conservation Area, located approximately 3.1 km south-east of the CO_2 Export Corridors;

- Wilton Conservation Area, located approximately 4.4 km south-east of the CO_2 Export Corridors; and
- Yearby Conservation Area, located approximately 4.4 km south-east of the CO_2 Export Corridors.

2.3.69 There is one scheduled monument within 5km of the CO_2 Export Corridors, a 'World War I early warning acoustic mirror 650m north west of Bridge Farm', located approximately 4.7 km south-east of the CO_2 Export Corridors in Redcar.

2.3.70 There are no world heritage sites, registered parks and gardens, registered battlefields or heritage coasts within 5 km of the CO_2 Export Corridors.

Landscape

2.3.71 The CO_2 Export Corridors are located within the Tees Lowlands NCA.

2.3.72 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the CO_2 Export Corridors and the surrounding area.

Hydrogen Pipeline Corridor – Main Site A

2.3.73 The Hydrogen Pipeline Corridor connects Main Site A to potential offtakers at various industrial installations across the Tees Valley. It currently comprises approximately 1,306 ha of predominantly industrial land, from Billingham in the west to Kirkleatham in the east and includes a crossing of the Tees. However, the land required for the construction and operation of the hydrogen pipeline network will be of much smaller area than this and the corridor will be refined during design work prior to submission of the Application. Refer to Section 3.5 for further detail.

2.3.74 The following environmental receptors have been identified in the vicinity of the Hydrogen Pipeline Corridor.

Residential

2.3.75 The Hydrogen Pipeline Corridor is predominantly located within industrial land, and as such, is generally remote from residential receptors. Near to Main Site A, the Hydrogen Pipeline Corridor is close to Dormanstown and Redcar. Dormanstown is located approximately 0.2 km to the east of the Hydrogen Pipeline Corridor, and Redcar is located approximately 2.2 km to the north-east of the Hydrogen Pipeline Corridor.

2.3.76 Where the Hydrogen Pipeline Corridor extends into the Wilton International Estate, it is approximately 0.4 km to the west of Kirkleatham.

2.3.77 At its western extent, the Hydrogen Pipeline Corridor is approximately 1.2 km north-east of Billingham and 0.5 km east of Wolviston. There is a small group of properties located approximately 50 m south of the Hydrogen Pipeline Corridor on Cowpen Lane, near Cowpen Bewley.

Traffic and Transport

2.3.78 The Tees Valley Line and Durham Coast railway lines run through the Hydrogen Pipeline Connection Corridor. The A1085 Trunk Road, Tees Dock Road, Seaton Carew

Road, Tees Road and Haverton Hill Road also pass through the Hydrogen Pipeline Connection Corridor.

2.3.79 15 PRoWs are located within the Hydrogen Pipeline Corridor (12 of which are footpaths and three of which are bridleways). Some of these PRoWs form part of the England Coast Path National Trail and the Teesdale Way long distance route. There are no other National Trails within 5 km of the Hydrogen Pipeline Corridor.

2.3.80 Whilst some of the Hydrogen Pipeline Corridor is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.81 Within 15 km of the Hydrogen Pipeline Corridor there are:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, part of which falls within the Hydrogen Pipeline Corridor;
  - North York Moors SPA, located approximately 7.9 km south-east of the Hydrogen Pipeline Corridor; and
  - Northumbria Coast SPA, located approximately 10 km north-west of the Hydrogen Pipeline Corridor.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, part of which falls within the Hydrogen Pipeline Corridor; and
  - Northumbria Coast Ramsar Site, located approximately 10.5 km north-west of the Hydrogen Pipeline Corridor.
- Three SACs:
  - North York Moors SAC, located approximately 8 km south-east of the Hydrogen Pipeline Corridor;
  - Durham Coast SAC, located approximately 10.5 km north-west of the Hydrogen Pipeline Corridor; and
  - Castle Eden Dene SAC, located approximately 13.5 km north-west of the Hydrogen Pipeline Corridor.
- Three NNRs:
  - Teesmouth NNR, some of which falls within the Hydrogen Pipeline Corridor;

- Durham Coast NNR, located approximately 9.5 km north-west of the Hydrogen Pipeline Corridor; and
- Castle Dene NNR, located approximately 13.5 km north-west of the Hydrogen Pipeline Corridor.

2.3.82 There are no proposed Ramsar Sites or potential SPAs within 15 km of the Hydrogen Pipeline Corridor.

2.3.83 There are two SSSIs within 5 km of the Hydrogen Pipeline Corridor:

- Teesmouth and Cleveland Coast SSSI, some of which is located within the Hydrogen Pipeline Corridor; and
- Lovell Hill Pools SSSI, located approximately 2.4 km south-east of the Hydrogen Pipeline Corridor.

2.3.84 There are 13 LNRs within 5 km of the Hydrogen Pipeline Corridor:

- Cowpen Bewley Woodland Country Park LNR, part of which is located within the Hydrogen Pipeline Corridor;
- Charlton's Pond LNR, located approximately 0.5 km west of the Hydrogen Pipeline Corridor;
- Seaton Dunes and Common LNR, located approximately 1.3 km north-east of the Hydrogen Pipeline Corridor;
- Billingham Beck Valley LNR, located approximately 1.4 km west of the Hydrogen Pipeline Corridor;
- Greatham Beck LNR, located approximately 1.8 km north-west of the Hydrogen Pipeline Corridor;
- Eston Moor LNR, located approximately 2.4 km south of the Hydrogen Pipeline Corridor;
- Linthorpe Cemetery LNR, located approximately 2.3 km south of the Hydrogen Pipeline Corridor;
- Norton Grange Marsh LNR, located approximately 2.8 km south-west of the Hydrogen Pipeline Corridor;
- Errington Wood LNR, located approximately 3.3 km west of the Hydrogen Pipeline Corridor;
- Berwick Hills LNR, located approximately 3.8 km south of the Hydrogen Pipeline Corridor;
- Flatts Lane Woodland Country Park LNR, located approximately 4.2 km south of the Hydrogen Pipeline Corridor;
- Summerhill LNR, located approximately 4 km north-west of the Hydrogen Pipeline Corridor; and

- Hardwick Dene & Elm Tree Woods LNR, located approximately 4.6 km south-west of the Hydrogen Pipeline Corridor.

Hydrology/ Flood Risk

2.3.85 The Hydrogen Pipeline Corridor crosses the River Tees. There are 20 other named watercourses within 1 km of the Hydrogen Pipeline Corridor:

- Claxton Beck, Seaton on Tees Channel, Knitting Wife Beck, Dabholm Gut, Holme Fleet, Greatham Creek, Mains Dike, Swallow Fleet, Dabholm Beck, Greatham Beck, Belasis Beck, Castle Gill, the Fleet, the Mill Race, all of which are partially or wholly located within the Hydrogen Pipeline Corridor;
- Ash Gill, located approximately 30 m east of the Hydrogen Pipeline Corridor;
- Cowbridge Beck, located approximately 160 m west of the Hydrogen Pipeline Corridor;
- Billingham Beck, located approximately 570 m south-west of the Hydrogen Pipeline Corridor;
- Kinkerdale Beck, located approximately 600 m south-west of the Hydrogen Pipeline Corridor; and
- Kettle Beck, located approximately 860 m south-west of the Hydrogen Pipeline Corridor.

2.3.86 The Environment Agency 'Flood map for planning' indicates that approximately half of the Hydrogen Pipeline Corridor is located within Flood Zone 1 that is defined as, "*land having a less than 0.1% AEP of river or sea flooding*", whilst the remaining land falls within Flood Zones 2 (between 0.1% and 1% AEP river flooding and between 0.1% and 0.5% AEP sea flooding) and 3 (greater than 1% AEP river flooding and greater than 0.5% AEP sea flooding). The areas of Flood Zones 2 and 3 are around the Tees and Dabholm Gut, and to the north of the Tees, as illustrated on Figure 11: Water Constraints within 5 km of the Proposed Development Site Boundary (Appendix A).

Geology and Hydrogeology

2.3.87 The Hydrogen Pipeline Corridor is variably underlain by a sequence of Made Ground, Tidal Flat Deposits, Alluvium (Clay, Silt, Sand and Gravel), Blown Sand, Devensian Glaciolacustrine Deposits (Clay and Silt) and Devensian Glacial Till (Boulder Clay). The superficial deposits are underlain by the Triassic Sherwood Sandstone Group in the western area of the Hydrogen Pipeline Corridor. The eastern area is underlain by mudstones from the Triassic Mercia Mudstone Group and Penarth Formation and the Jurassic Redcar Mudstone Formation.

2.3.88 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Hydrogen Pipeline Corridor. A small part of the Hydrogen Pipeline Corridor, in Billingham, falls within a NVZ.

Cultural Heritage

2.3.89 There are no designated heritage assets within the Hydrogen Pipeline Corridor.

2.3.90 There are 488 listed buildings within 5 km of the Hydrogen Pipeline Corridor. The closest are Grade II Village Farmhouse, Billingham, located approximately 70 m south of the Hydrogen Pipeline Corridor, and Grade II* 'Phosphate rock silo number 15 at ICI works, Billingham', located approximately 260 m south of the Hydrogen Pipeline Corridor.

2.3.91 There are 21 Conservation Areas within 5 km of the Hydrogen Pipeline Corridor, the closest of which are Cowpen Bewley Conservation Area, part of which falls within the Hydrogen Pipeline Corridor, and Kirkleatham Conservation Area, located approximately 150 m east of the Hydrogen Pipeline Corridor.

2.3.92 There are 25 scheduled monuments within 5 km of the Hydrogen Pipeline Corridor, the closest of which are Claxton medieval moated site, 'Bowl barrow 1.1 km north-west of High Court Green' and 'Eston Nab hill fort, palisaded settlement and beacon'. Claxton medieval moated site is located approximately 2 km north-west of the Hydrogen Pipeline Corridor. 'Bowl barrow 1.1 km north-west of High Court Green' and 'Eston Nab hill fort, palisaded settlement and beacon' are located approximately 2.4 km south of the Hydrogen Pipeline Corridor.

2.3.93 There are two registered parks and gardens within 5 km of the Hydrogen Pipeline Corridor: Grade II Albert Park, located approximately 2.7 km south-east of the Hydrogen Pipeline Corridor in Middlesborough, and Grade II* Ropner Park, located approximately 4.7 km south-east of the Hydrogen Pipeline Corridor in Stockton-on-Tees.

2.3.94 There are no world heritage sites, registered battlefields or heritage coasts within 5 km of the Hydrogen Pipeline Corridor.

Landscape

2.3.95 The Hydrogen Pipeline Corridor is located within the Tees Lowlands NCA.

2.3.96 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Hydrogen Pipeline Corridor and the surrounding area.

Natural Gas Connection Corridor – Main Site A

2.3.97 The identified indicative Natural Gas Connection Corridor comprises approximately 11 ha of industrial land connecting the Production Facility to the wider gas supply infrastructure in the area. However, the land required for the Natural Gas Connection Corridor will be refined during design work prior to submission of the Application. Refer to Section 3.4 for further detail.

2.3.98 The following environmental receptors have been identified in the vicinity of the Natural Gas Connection Corridor.

Residential

2.3.99 The Natural Gas Connection Corridor is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 0.8 km north-east of the Natural Gas Connection Corridor in Warrenby.

2.3.100 Dormanstown is located approximately 1.1 km to the south-east of the Natural Gas Connection Corridor, and Redcar is located approximately 2.5 km to the east of the Natural Gas Connection Corridor.

Traffic and Transport

2.3.101 The Tees Valley Line railway runs approximately 0.5 km south-east of the Natural Gas Connection Corridor.

2.3.102 There are no PRoWs within or adjacent to the Natural Gas Connection Corridor. The Teesdale Way long distance route runs approximately 0.5 km north-east of the Natural Gas Connection Corridor. The England Coast Path National Trail runs approximately 0.8 km north-east of the Natural Gas Connection Corridor. There are no other National Trails within 5 km of the Natural Gas Connection Corridor.

2.3.103 Whilst the Natural Gas Connection Corridor is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.104 Within 15 km of the Natural Gas Connection Corridor there are:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, located approximately 0.7 km south and 1 km north of the Natural Gas Connection Corridor;
  - North York Moors SPA, located approximately 11.7 km south-east of the Natural Gas Connection Corridor; and
  - Northumbria Coast SPA, located approximately 14.9 km north-west of the Natural Gas Connection Corridor.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, located approximately 0.7 km north of the Natural Gas Connection Corridor; and
  - Northumbria Coast Ramsar Site, located approximately 14.9 km north-west of the Natural Gas Connection Corridor.
- Two SACs:
  - North York Moors SAC, located approximately 11.7 km south-east of the Natural Gas Connection Corridor; and

  - Durham Coast SAC, located approximately 14.9 km north-west of the Natural Gas Connection Corridor.

- Two NNRs:
  - Teesmouth NNR, located approximately 2.7 km west of the Natural Gas Connection Corridor; and
  - Durham Coast NNR, located approximately 13.8 km north-west of the Natural Gas Connection Corridor.

2.3.105 There are no proposed Ramsar Sites or potential SPAs within 15 km of the Natural Gas Connection Corridor.

2.3.106 There is one SSSI within 5 km of the Natural Gas Connection Corridor, that being Teesmouth and Cleveland Coast SSSI, located approximately 0.5 km north-east of the Natural Gas Connection Corridor.

2.3.107 There is one LNR within 5 km of the Natural Gas Connection Corridor, that being Seaton Dunes and Common LNR, located approximately 4.1 km north-west of the Natural Gas Connection Corridor.

Hydrology/ Flood Risk

2.3.108 The Tees Estuary at Tees Mouth is located approximately 1.8 km west of the Natural Gas Connection Corridor. Other watercourses within 1 km of the Natural Gas Connection Corridor include:

- The Fleet, located approximately 80 m east of the Natural Gas Connection Corridor;
- The Mill Race, located approximately 0.4 km south of the Natural Gas Connection Corridor.
- Ash Gill, located approximately 0.5 km east of the Natural Gas Connection Corridor;
- Dabholm Gut, located approximately 0.8 km south of the Natural Gas Connection Corridor; and
- Dabholm Beck, located approximately 0.9 km south of the Natural Gas Connection Corridor.

2.3.109 The Environment Agency 'Flood map for planning' indicates that the whole of the Natural Gas Connection Corridor is located within Flood Zone 1, that is defined as "*land having a less than 0.1% AEP of river or sea flooding*".

Geology and Hydrogeology

2.3.110 The Natural Gas Connection Corridor is underlain by a sequence of Made Ground, Tidal Flat Deposits and mudstones of the Redcar Mudstone Formation. An area of Blown Sand superficial deposits may be present along the eastern boundary of the Natural Gas Connection Corridor.

2.3.111 There are no SPZs, NVZs, Drinking Water Protected Areas or Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Natural Gas Connection Corridor.

Cultural Heritage

2.3.112 There are no designated heritage assets within the Natural Gas Connection Corridor.

2.3.113 There are 83 listed buildings within 5 km of the Natural Gas Connection Corridor. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 750 m north-east of the Natural Gas Connection Corridor in Warrenby.

2.3.114 There are four Conservation Area within 5 km of the Natural Gas Connection Corridor:

- Coatham, Redcar Conservation Area, located approximately 1.9 km east of the Natural Gas Connection Corridor;
- Kirkleatham Conservation Area, located approximately 3.1 km south-east of the Natural Gas Connection Corridor;
- Wilton Conservation Area, located approximately 4.4 km south-east of the Natural Gas Connection Corridor; and
- Yearby Conservation Area, located approximately 4.4 km south-east of the Natural Gas Connection Corridor.

2.3.115 There is one scheduled monument within 5 km of the Natural Gas Connection Corridor: 'World War I early warning acoustic mirror 650 m north-west of Bridge Farm', located approximately 4.6 km east of the Natural Gas Connection Corridor in Redcar.

2.3.116 There are no world heritage sites, registered parks and gardens, registered battlefields or heritage coasts within 5 km of the Natural Gas Connection Corridor.

Landscape

2.3.117 The Natural Gas Connection Corridor is located within the Tees Lowlands NCA.

2.3.118 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Natural Gas Connection Corridor and the surrounding area.

Other Gases Connection Corridor – Main Site A

2.3.119 The identified indicative Other Gases Connection Corridor comprises approximately 33 ha of industrial land connecting the Production Facility to wider gas supply infrastructure in the area. However, the land required for the Other Gases Connection Corridor will be refined during design work prior to submission of the Application. Refer to Section 3.8 for further detail.

2.3.120 The following environmental receptors have been identified in the vicinity of the Other Gases Connection Corridor.

Residential

2.3.121 The Other Gases Connection Corridor is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 0.9 km north-east of the Other Gases Connection Corridor in Warrenby.

2.3.122 Dormanstown is located approximately 1.1 km to the east of the Other Gases Connection Corridor, and Redcar is located approximately 2.5 km to the east of the Other Gases Connection Corridor.

Traffic and Transport

2.3.123 The Tees Valley Line railway runs through approximately 1.1 km of the Other Gases Connection Corridor. Tees Dock Road also passes through the Other Gases Connection Corridor.

2.3.124 Bridleway 116/9/1 and footpath 102/2/3 (which form part of the Teesdale Way long distance route and England Coast Path National Trail) run adjacent to the Other Gases Connection Corridor for approximately 0.8 km. A small section of bridleway 116/9/1 falls within the Other Gases Connection Corridor, close to Dabholm Gut. A small section of footpath 102/2A/2 also falls within the Other Gases Connection Corridor, by Tees Dock Road. There are no other National Trails within 5 km of the Other Gases Connection Corridor.

2.3.125 Whilst the Other Gases Connection Corridor is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.126 Within 15 km of the Other Gases Connection Corridor there are:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, located approximately 0.3 km south-west of the Other Gases Connection Corridor;
  - North York Moors SPA, located approximately 10.4 km south-east of the Other Gases Connection Corridor; and
  - Northumbria Coast SPA, located approximately 14.6 km north-west of the Other Gases Connection Corridor.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, located approximately 0.3 km south-west of the Other Gases Connection Corridor; and
  - Northumbria Coast Ramsar Site, located approximately 14.6 km north-west of the Other Gases Connection Corridor.
- Two SACs:

  - North York Moors SAC, located approximately 10.4 km south-east of the Other Gases Connection Corridor; and
  - Durham Coast SAC, located approximately 14.6 km north-west of the Other Gases Connection Corridor.

- Two NNRs:
  - Teesmouth NNR, located approximately 2.2 km west of the Other Gases Connection Corridor; and
  - Durham Coast NNR, located approximately 13.5 km north-west of the Other Gases Connection Corridor.

2.3.127 There are no proposed Ramsar Sites or potential SPAs within 15 km of the Other Gases Connection Corridor.

2.3.128 There is one SSSI within 5 km of the Other Gases Connection Corridor, that being Teesmouth and Cleveland Coast SSSI, located approximately 0.3 km south-west of the Other Gases Connection Corridor.

2.3.129 There are two LNRs within 5 km of the Other Gases Connection Corridor: Seaton Dunes and Common LNR, located approximately 3.7 km north-west of the Other Gases Connection Corridor, and Eston Moor LNR, located approximately 4.7 km south-east of the Other Gases Connection Corridor.

Hydrology/ Flood Risk

2.3.130 The Tees Estuary at Tees Mouth is located approximately 1.6 km north-west of the Other Gases Connection Corridor. Other watercourses within 1 km of the Other Gases Connection Corridor include:

- The Fleet, Dabholm Gut, Dabholm Beck and the Mill Race, which are partially or wholly located within the Other Gases Connection Corridor; and
- Ash Gill located approximately 0.4 km east of the Other Gases Connection Corridor.

2.3.131 The Environment Agency 'Flood map for planning' indicates that the majority of the Other Gases Connection Corridor is located within Flood Zone 1, that is defined as "*land having a less than 0.1% AEP of river or sea flooding*". A small part of the Other Gases Connection Corridor, Dabholm Gut, falls within Flood Zones 2 (between 0.1% and 1% AEP river flooding and between 0.1% and 0.5% AEP sea flooding) and 3 (greater than 1% AEP river flooding and greater than 0.5% AEP sea flooding), as illustrated on Figure 11: Water Constraints within 5 km of the Proposed Development Site Boundary (Appendix A).

Geology and Hydrogeology

2.3.132 The Other Gases Connection Corridor is underlain by a sequence of Made Ground, Tidal Flat Deposits, and mudstones of the Triassic Penarth Formation and Jurassic Redcar Mudstone Formation. An area of Blown Sand superficial deposits may be

present, underlying a small portion of the north-eastern bend of the Other Gases Connection Corridor.

2.3.133 There are no SPZs, NVZs, Drinking Water Protected Areas or Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Other Gases Connection Corridor.

Cultural Heritage

2.3.134 There are no designated heritage assets within the Other Gases Connection Corridor.

2.3.135 There are 105 listed buildings within 5 km of the Other Gases Connection Corridor. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 0.9 km north-east of the Other Gases Connection Corridor in Warrenby.

2.3.136 There are four Conservation Areas within 5 km of the Other Gases Connection Corridor:

- Coatham, Redcar Conservation Area, located approximately 2 km east of the Other Gases Connection Corridor;
- Kirkleatham Conservation Area, located approximately 2.9 km south-east of the Other Gases Connection Corridor;
- Wilton Conservation Area, located approximately 3.5 km south-east of the Other Gases Connection Corridor; and
- Yearby Conservation Area, located approximately 4 km south-east of the Other Gases Connection Corridor.

2.3.137 There are six scheduled monuments within 5 km of the Other Gases Connection Corridor, the closest of which is 'World War I early warning acoustic mirror 650 m north-west of Bridge Farm', located approximately 4.6 km east of the Other Gases Connection Corridor in Redcar.

2.3.138 There are no world heritage sites, registered parks and gardens, registered battlefields or heritage coasts within 5 km of the Other Gases Connection Corridor.

Landscape

2.3.139 The Other Gases Connection Corridor is located within the Tees Lowlands NCA.

2.3.140 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Other Gases Connection Corridor and the surrounding area.

Electrical Connection Corridor – Main Site A

2.3.141 The Electrical Connection Corridor connects the Production Facility to the electricity transmission network; it extends from Main Site A in the north, to Grangetown in the south. It comprises approximately 287 ha. However, the land required for the Electrical Connection Corridor will be refined during design work prior to submission of the Application. Refer to Section 3.6 for further detail.

2.3.142 The following environmental receptors have been identified in the vicinity of the Electrical Connection Corridor.

Residential

2.3.143 The Electrical Connection Corridor is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 0.6 km north-east of the Electrical Connection Corridor in Warrenby.

2.3.144 Near to Main Site A, the Electrical Connection Corridor is close to Dormanstown and Redcar. Dormanstown is located approximately 0.7 km to the east of the Electrical Connection Corridor, and Redcar is located approximately 2 km to the north-east of the Electrical Connection Corridor. At its southern end, the Electrical Connection Corridor is adjacent to Grangetown.

Traffic and Transport

2.3.145 The Tees Valley Line railway runs through the Electrical Connection Corridor, as does the A1085 Trunk Road, Greystone Road and Tees Dock Road.

2.3.146 There are nine PRoWs within the Electrical Connection Corridor (two of which are bridleways, and seven of which are footpaths). Some of these PRoWs form part of the England Coast Path National Trail and the Teesdale Way long distance route. There are no other National Trails within 5 km of the Electrical Connection Corridor.

2.3.147 Whilst some of the Electrical Connection Corridor is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.148 Within 15 km of the Electrical Connection Corridor there are:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, located approximately 0.1 km west of the Electrical Connection Corridor;
  - North York Moors SPA, located approximately 8.3 km south-east of the Electrical Connection Corridor; and
  - Northumbria Coast SPA, located approximately 14.4 km north-west of the Electrical Connection Corridor.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, located approximately 120 m west of the Electrical Connection Corridor; and
  - Northumbria Coast Ramsar Site, located approximately 14.4 km north-west of the Electrical Connection Corridor.

- Two SACs:
  - North York Moors SAC, located approximately 8.4 km south-east of the Electrical Connection Corridor; and
  - Durham Coast SAC, located approximately 14.4 km north-west of the Electrical Connection Corridor.
- Two NNRs:
  - Teesmouth NNR, located approximately 2.1 km west of the Electrical Connection Corridor; and
  - Durham Coast NNR, located approximately 13.4 km north-west of the Electrical Connection Corridor.

2.3.149 There are no proposed Ramsar Sites or potential SPAs within 15 km of the Electrical Connection Corridor.

2.3.150 There are two SSSIs within 5 km of the Electrical Connection Corridor:

- Teesmouth and Cleveland Coast SSSI, located approximately 120 m west of the Electrical Connection Corridor; and
- Lovell Hill Pools SSSI, located approximately 4 km south-east of the Electrical Connection Corridor.

2.3.151 There are four LNRs within 5 km of the Electrical Connection Corridor:

- Eston Moor LNR, located approximately 2.6 km south-east of the Electrical Connection Corridor;
- Flatts Lane Woodland Country Park LNR, located approximately 3.8 km south of the Electrical Connection Corridor
- Seaton Dunes and Common LNR, located approximately 3.7 km north-west of the Electrical Connection Corridor; and
- Berwick Hills LNR, located approximately 4.2 km south-west of the Electrical Connection Corridor.

Hydrology/ Flood Risk

2.3.152 The Tees Estuary at Tees Mouth is located approximately 1.2 km west of the Electrical Connection Corridor. Other watercourses within 1 km of the Electrical Corridor include:

- The Mill Race, Knitting Wife Beck, The Fleet, Cross Beck, Dabholm Gut and Dabholm Beck, which are partially or wholly located within the Electrical Connection Corridor;
- Ash Gill, adjacent to the Electrical Connection Corridor;
- Kinkerdale Beck, located approximately 80 m east of the Electrical Connection Corridor;

- Kettle Beck, located approximately 80 m south of the Electrical Connection Corridor;
- Castle Gill, located approximately 0.3 km south-east of the Electrical Connection Corridor; and
- Mains Dike, located approximately 0.8 km south-east of the Electrical Connection Corridor.

2.3.153 The Environment Agency 'Flood map for planning' indicates that the majority of the Electrical Connection Corridor is located within Flood Zone 1 that is defined as, "*land having a less than 0.1% AEP of river or sea flooding*". As illustrated on Figure 11: Water Constraints within 5 km of the Proposed Development Site Boundary (Appendix A), a small part of the Electrical Connection Corridor, between the Teesport Estate and the Trunk Road Industrial Estate, falls within Flood Zones 2 (between 0.1% and 1% AEP river flooding and between 0.1% and 0.5% AEP sea flooding) and 3 (greater than 1% AEP river flooding and greater than 0.5% AEP sea flooding).

Geology and Hydrogeology

2.3.154 The Electrical Connection Corridor is underlain by a sequence of Made Ground, Tidal Flat Deposits, Blown Sand, Devensian Glaciolacustrine Deposits (Clay and Silt) and Devensian Glacial Till. The superficial deposits are underlain by mudstones from the Mercia Mudstone Group, Penarth Formation and the Redcar Mudstone Formation.

2.3.155 There are no SPZs, NVZs, Drinking Water Protected Areas or Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Electrical Connection Corridor.

Cultural Heritage

2.3.156 There are no designated heritage assets within the Electrical Connection Corridor.

2.3.157 There are 144 listed buildings within 5 km of the Electrical Connection Corridor. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 610 m north-east of the Electrical Connection Corridor in Warrenby.

2.3.158 There are five Conservation Areas within 5 km of the Electrical Connection Corridor:

- Coatham Conservation Area, Redcar, located approximately 1.6 km north-east of the Electrical Connection Corridor;
- Wilton Conservation Area, located approximately 1.8 km south-east of the Electrical Connection Corridor;
- Kirkleatham Conservation Area, located approximately 2.2 km east of the Electrical Connection Corridor;
- Yearby Conservation Area, located approximately 3.2 km south-east of the Electrical Connection Corridor; and

- Ormesby Hall Conservation Area, located approximately 3.9 km south of the Electrical Connection Corridor.

2.3.159 There are 19 scheduled monuments within 5 km of the Electrical Connection Corridor, the closest of which is Eston Nab hill fort, palisaded settlement and beacon', located approximately 2.6 km south of the Electrical Connection Corridor.

2.3.160 There are no registered parks and gardens, world heritage sites, registered battlefields or heritage coasts within 5 km of the Electrical Connection Corridor.

Landscape

2.3.161 The Electrical Connection Corridor is located within the Tees Lowlands NCA.

2.3.162 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Electrical Connection Corridor and the surrounding area.

Water Connections Corridor – Main Site A

2.3.163 The Water Connections Corridor are described in Section 3.7 and comprises approximately 218 ha of mostly industrial land. The land required for the Water Connections Corridor will be refined during design work prior to submission of the Application.

2.3.164 The following environmental receptors have been identified in the vicinity of the Water Connections Corridor.

Residential

2.3.165 The Water Connections Corridor is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 0.4 km east of the Water Connections Corridor in Warrenby.

2.3.166 Dormanstown is located approximately 0.4 km to the east of the Water Connections Corridor, and Redcar is located approximately 2 km to the east of the Water Connections Corridor.

Traffic and Transport

2.3.167 The Tees Valley Line railway and the A1085 Trunk Road pass through the Water Connections Corridor.

2.3.168 There are three PRoWs within the Water Connections Corridor: bridleways 116/9/1, 116/9/2 and 116/10/2. Bridleways 116/9/1 and 116/9/2 form part of the England Coast Path National Trail and Teesdale Way long distance route. There are no other National Trails within 5 km of the Water Connections Corridor.

2.3.169 Whilst the Water Connections Corridor is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.170 Within 15 km of the Water Connections Corridor there are:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, located approximately 0.5 km west of the Water Connections Corridor;
  - North York Moors SPA, located approximately 9.1 km south-east of the Water Connections Corridor; and
  - Northumbria Coast SPA, located approximately 14.9 km north-west of the Water Connections Corridor.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, located approximately 0.5 km north of the Water Connections Corridor; and
  - Northumbria Coast Ramsar Site, located approximately 14.9 km north-west of the Water Connections Corridor.
- Two SACs:
  - North York Moors SAC, located approximately 9.1 km south-east of the Water Connections Corridor; and
  - Durham Coast SAC, located approximately 14.9 km north-west of the Water Connections Corridor.
- Two NNRs:
  - Teesmouth NNR, located approximately 2.6 km west of the Water Connections Corridor; and
  - Durham Coast NNR, located approximately 13.8 km north-west of the Water Connections Corridor.

2.3.171 There are no proposed Ramsar Sites or potential SPAs within 15 km of the Water Connections Corridor.

2.3.172 There are two SSSIs within 5 km of the Water Connections Corridor:

- Teesmouth and Cleveland Coast SSSI, located approximately 70 m north of the Water Connections Corridor; and
- Lovell Hill Pools SSSI, located approximately 3.6 km south-east of the Water Connections Corridor.

2.3.173 There are three LNRs within 5 km of the Water Connections Corridor:

- Seaton Dunes and Common LNR, located approximately 4.1 km north-west of the Water Connections Corridor;
- Eston Moor LNR, located approximately 3.6 km south of the Water Connections Corridor; and
- Errington Wood LNR, located approximately 4.1 km south-east of the Water Connections Corridor.

Hydrology/ Flood Risk

2.3.174 The Tees Estuary at Tees Mouth is located approximately 1.4 km west of the Water Connections Corridor. Other watercourses within 1 km of the Water Connections Corridor include:

- The Fleet, The Mill Race and Dabholm Beck, Dabholm Gut and Mains Dike, all of which are partially located within the Water Connections Corridor; and
- Ash Gill, adjacent to the Water Connections Corridor.

2.3.175 The Environment Agency 'Flood map for planning' indicates that the majority of the Water Connections Corridor is located within Flood Zone 1 that is defined as, "*land having a less than 0.1% AEP of river or sea flooding*". As illustrated on Figure 11: Water Constraints within 5 km of the Proposed Development Site Boundary (Appendix A), a small part of the Water Connections Corridor, between the Teesport Estate and Trunk Road Industrial Estate, Dormanstown, falls within Flood Zones 2 (between 0.1% and 1% AEP river flooding and between 0.1% and 0.5% AEP sea flooding) and 3 (greater than 1% AEP river flooding and greater than 0.5% AEP sea flooding).

Geology and Hydrogeology

2.3.176 The Water Connections Corridor is underlain by Made Ground, Tidal Flat Deposits, Glaciolacustrine Deposits, Devensian Glacial Till and mudstones of the Redcar Mudstone Formation. An area of Blown Sand (superficial deposits) may be present along the eastern boundary of the Water Connections Corridor.

2.3.177 There are no SPZs, NVZs, Drinking Water Protected Areas or Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Water Connections Corridor.

Cultural Heritage

2.3.178 There are no designated heritage assets within the Water Connections Corridor.

2.3.179 There are 127 listed buildings within 5 km of the Water Connections Corridor. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 0.5 km east of the Water Connections Corridor in Warrenby.

2.3.180 There are five Conservation Areas within 5 km of the Water Connections Corridor:

- Kirkleatham Conservation Area, located approximately 0.9 km east of the Water Connections Corridor;
- Coatham Conservation Area, Redcar, located approximately 1.6 km north-east of the Water Connections Corridor;
- Wilton Conservation Area, located approximately 1.9 km south-east of the Water Connections Corridor;
- Yearby Conservation Area, located approximately 2 km south-east of the Water Connections Corridor; and
- Marske-by-the-Sea Conservation Area, located approximately 4.8 km east of the Water Connections Corridor.

2.3.181 There are 19 scheduled monuments within 5 km of the Water Connections Corridor, the closest of which is 'World War I early warning acoustic mirror 650 m north-west of Bridge Farm', located approximately 3.1 km east of the Water Connections Corridor in Redcar.

2.3.182 There are no world heritage sites, registered parks and gardens, registered battlefields or heritage coasts within 5 km of the Water Connections Corridor.

Landscape

2.3.183 The Water Connections Corridor is located within the Tees Lowlands NCA.

2.3.184 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Water Connections Corridor and the surrounding area.

CO_2 Export Corridor – RBT Extension

2.3.185 The CO_2 Export Corridor RBT Extension comprises approximately 10ha of industrial land within and adjacent to Main Site A. If Main Site B were to be progressed, both the CO_2 Export Corridor as described for Main Site A, and the CO_2 Export Corridor RBT Extension, would be required, as shown on Figure 3a: Parts of the Proposed Development Site Boundary (Main Site B – RBT).

2.3.186 The following environmental receptors have been identified in the vicinity of CO_2 Export Corridor RBT Extension. Only receptors which are closer to the CO_2 Export Corridor RBT Extension than they are the CO_2 Export Corridors for Main Site A are listed.

- Teesmouth and Cleveland Coast SPA, Teesmouth and Cleveland Coast Ramsar Site and Teesmouth and Cleveland Coast SSSI are located approximately 0.3 km south-west of the CO_2 Export Corridor RBT Extension (for reference, they are located approximately 0.5 km north of the CO_2 Export Corridors);
- Northumbria Coast SPA, Northumbria Coast Ramsar Site and Durham Coast SAC are located approximately 14.2 km north-west of the CO_2 Export Corridor RBT Extension (for reference, they are located approximately 14.6 km north-west of the CO_2 Export Corridors);

- Teesmouth NNR is located approximately 1.9 km west of the CO_2 Export Corridor RBT Extension (for reference, it is located approximately 2.7 km west of the CO_2 Export Corridors);
- Durham Coast NNR is located approximately 13.1 km north-west of the CO_2 Export Corridor RBT Extension (for reference, it is located approximately 13.6 km west of the CO_2 Export Corridors);
- Seaton Dunes and Common LNR is located approximately 3.3 km north-west of the CO_2 Export Corridor RBT Extension (for reference, it is located approximately 3.8 km north-west of the CO_2 Export Corridors);
- The Tees Estuary at Tees Mouth is located approximately 1 km west of the CO_2 Export Corridor RBT Extension (for reference, it is located approximately 1.8 km west of the CO_2 Export Corridors); and
- Dabholm Gut is located approximately 0.7 km south of the CO_2 Export Corridor RBT Extension (for reference, it is located approximately 0.8 km south of the CO_2 Export Corridors).

Hydrogen Pipeline Corridor – RBT Extension

2.3.187 The Hydrogen Pipeline Corridor RBT Extension comprises approximately 12ha of industrial land within Main Site A. If Main Site B were to be progressed, both the Hydrogen Pipeline Corridor as described for Main Site A, and the Hydrogen Pipeline Corridor RBT Extension, would be required, as shown on Figure 3a: Parts of the Proposed Development Site Boundary (Main Site B – RBT).

2.3.188 The Hydrogen Pipeline Corridor RBT Extension is not closer to any sensitive receptors than the Hydrogen Pipeline Corridor for Main Site A.

Natural Gas Connection Corridor – RBT Extension

2.3.189 The Natural Gas Connection Corridor RBT Extension comprises approximately 10 ha of industrial land within and adjacent to Main Site A. If Main Site B were to be progressed, both the Natural Gas Connection Corridor as described for Main Site A, and the Natural Gas Connection Corridor RBT Extension, would be required, as shown on Figure 3a: Parts of the Proposed Development Site Boundary (Main Site B – RBT).

2.3.190 The following environmental receptors have been identified in the vicinity of Natural Gas Connection Corridor RBT Extension. Only receptors which are closer to the Natural Gas Connection Corridor RBT Extension than they are the Natural Gas Connection Corridor for Main Site A are listed.

- Teesmouth and Cleveland Coast SPA, Teesmouth and Cleveland Coast Ramsar Site and Teesmouth and Cleveland Coast SSSI are located approximately 0.3 km south-west of the Natural Gas Connection Corridor RBT Extension (for reference, they are located approximately 0.7 km south-west of the Natural Gas Connection Corridor);

- Northumbria Coast SPA, Northumbria Coast Ramsar Site and Durham Coast SAC are located approximately 14.2 km north-west of the Natural Gas Connection Corridor RBT Extension (for reference, they are located approximately 14.9 km south-west of the Natural Gas Connection Corridor);
- Teesmouth NNR is located approximately 1.9 km west of the Natural Gas Connection Corridor RBT Extension (for reference, it is located approximately 2.7 km west of the Natural Gas Connection Corridor);
- Durham Coast NNR is located approximately 13.1 km north-west of the Natural Gas Connection Corridor RBT Extension (for reference, it is located approximately 13.8 km north-west of the Natural Gas Connection Corridor);
- Seaton Dunes and Common LNR is located approximately 3.3 km north-west of the Natural Gas Connection Corridor RBT Extension (for reference, it is located approximately 4.1 km north-west of the Natural Gas Connection Corridor);
- The Tees Estuary at Tees Mouth is located approximately 1 km west of the Natural Gas Connection Corridor RBT Extension (for reference, it is located approximately 1.8 km west of the Natural Gas Connection Corridor); and
- Dabholm Gut is located approximately 0.7 km south of the Natural Gas Connection Corridor RBT Extension (for reference, it is located approximately 0.8 km south of the Natural Gas Connection Corridor).

Other Gases Connection Corridor – RBT Extension

2.3.191 The Other Gases Connection Corridor RBT Extension comprises approximately 6 ha of industrial land within and adjacent to Main Site A. If Main Site B were to be progressed, both the Other Gases Connection Corridor as described for Main Site A, and the Other Gases Connection Corridor RBT Extension, would be required, as shown on Figure 3a: Parts of the Proposed Development Site Boundary (Main Site B – RBT).

2.3.192 The following environmental receptors have been identified in the vicinity of Other Gases Connection Corridor RBT Extension; only receptors which are closer to the Other Gases Connection Corridor RBT Extension than they are the Other Gases Connection Corridor for Main Site A are listed.

- Northumbria Coast SPA, Northumbria Coast Ramsar Site and Durham Coast SAC are located approximately 14.2 km north-west of the Other Gases Connection Corridor RBT Extension (for reference, they are located approximately 14.6 km north-west of the Other Gases Connection Corridor);
- Teesmouth NNR is located approximately 1.9 km west of the Other Gases Connection Corridor RBT Extension (for reference, it is located approximately 2.2 km west of the Other Gases Connection Corridor);
- Durham Coast NNR is located approximately 13.1 km north-west of the Other Gases Connection Corridor RBT Extension (for reference, it is located approximately 13.5 km north-west of the Other Gases Connection Corridor);

- Seaton Dunes and Common LNR is located approximately 3.3 km north-west of the Other Gases Connection Corridor RBT Extension (for reference, it is located approximately 3.7 km north-west of the Other Gases Connection Corridor); and
- The Tees Estuary at Tees Mouth is located approximately 1 km west of the Other Gases Connection Corridor RBT Extension (for reference, it is located approximately 1.6 km west of the Other Gases Connection Corridor).

Electrical Connection Corridor – RBT Extension

2.3.193 The Electrical Connection Corridor RBT Extension comprises approximately 7 ha of industrial land within and adjacent to Main Site A. If Main Site B were to be progressed, both the Electrical Connection Corridor as described for Main Site A, and the Electrical Connection Corridor RBT Extension, would be required, as shown on Figure 3a: Parts of the Proposed Development Site Boundary (Main Site B – RBT).

2.3.194 The following environmental receptors have been identified in the vicinity of Electrical Connection Corridor RBT Extension. Only receptors which are closer to the Electrical Connection Corridor RBT Extension than they are the Electrical Connection Corridor for Main Site A are listed.

- Northumbria Coast SPA, Northumbria Coast Ramsar Site and Durham Coast SAC are located approximately 14.2 km north-west of the Electrical Connection Corridor RBT Extension (for reference, they are located approximately 14.4 km north-west of the Electrical Connection Corridor);
- Teesmouth NNR is located approximately 1.9 km west of the Electrical Connection Corridor RBT Extension (for reference, it is located approximately 2.1 km west of the Electrical Connection Corridor);
- Durham Coast NNR is located approximately 13.1 km north-west of the Electrical Connection Corridor RBT Extension (for reference, it is located approximately 13.4 km north-west of the Electrical Connection Corridor);
- Seaton Dunes and Common LNR is located approximately 3.3 km north-west of the Electrical Connection Corridor RBT Extension (for reference, it is located approximately 3.7 km north-west of the Electrical Connection Corridor); and
- The Tees Estuary at Tees Mouth is located approximately 0.9 km west of the Electrical Connection Corridor RBT Extension (for reference, it is located approximately 1.2 km west of the Electrical Connection Corridor).

Water Connections Corridor – RBT Extension

2.3.195 The Water Connections Corridor RBT Extension comprises approximately 14 ha of industrial land within and adjacent to Main Site A. If Main Site B were to be progressed, both the Water Connections Corridor as described for Main Site A, and the Water Connections Corridor RBT Extension, would be required, as shown on Figure 3a: Parts of the Proposed Development Site Boundary (Main Site B – RBT).

2.3.196 The following environmental receptors have been identified in the vicinity of Water Connections Corridor RBT Extension; only receptors which are closer to the Water Connections Corridor RBT Extension than they are the Water Connections Corridor for Main Site A are listed.

- Teesmouth and Cleveland Coast SPA and Teesmouth and Cleveland Coast Ramsar Site are located approximately 0.3 km south-west of the Water Connections Corridor RBT Extension (for reference, they are located approximately 0.7 km south-west of the Water Connection Corridor);
- Northumbria Coast SPA, Northumbria Coast Ramsar Site and Durham Coast SAC are located approximately 14.2 km north-west of the Water Connections Corridor RBT Extension (for reference, they are located approximately 14.9 km south-west of the Water Connections Corridor);
- Teesmouth NNR is located approximately 1.9 km west of the Water Connections Corridor RBT Extension (for reference, it is located approximately 2.6 km west of the Water Connections Corridor);
- Durham Coast NNR is located approximately 13.1 km north-west of the Water Connections Corridor RBT Extension (for reference, it is located approximately 13.8 km north-west of the Water Connections Corridor);
- Seaton Dunes and Common LNR is located approximately 3.3 km north-west of the Water Connections Corridor RBT Extension (for reference, it is located approximately 4.1 km north-west of the Water Connections Corridor); and
- The Tees Estuary at Tees Mouth is located approximately 0.9 km west of the Water Connections Corridor RBT Extension (for reference, it is located approximately 1.4 km west of the Water Connections Corridor).

3.0 PROPOSED DEVELOPMENT

3.1 Overview

3.1.1 As outlined in Section 1.0, the Proposed Development comprises the construction, operation, and maintenance of a 1.2 GWth LHV (Phase 1 600 MWth LHV and Phase 2 600 MWth LHV) Carbon, Capture and Storage (CCS) enabled Hydrogen Production Facility located in the Teesside industrial cluster area. In summary, the Proposed Development also comprises the following elements:

- hydrogen distribution pipelines to supply H_2 to various offtakers on Teesside and within the surrounding area, such pipelines to be utilised in association with the H_2 production plant;
- an Air Separation Unit (ASU) to supply O_2 for the H_2 production process;
- O_2 and N_2 supply pipelines (as an alternative to the ASU) to supply O_2 and N_2 for the H_2 production process;
- CO_2 capture and compression facilities and a connection to the NEP;
- a natural gas supply connection for the supply of gas to the H_2 production plant;
- an electricity grid connection to provide power to the Proposed Development;
- water supply and treatment infrastructure;
- wastewater treatment and disposal infrastructure; and
- other utilities connections, telecommunications, and other associated and ancillary infrastructure.

3.1.2 The Production Facility and associated infrastructure which form part of the Proposed Development will be located on the 'Main Site'. There are currently two Main Site options – Main Sites A and B. Main Site A would be located within land owned by Teesworks known as 'The Foundry'. Main Site B would be located to the west of Main Site A within land owned by Redcar Bulk Terminal, known as 'RBT'. Both Main Sites are located within Redcar and Cleveland Borough, with the connection corridors extending further into Stockton-on-Tees and Hartlepool, all within Teesside.

3.1.3 The Production Facility at the Main Site will need a hydrogen pipeline to transport the H_2 produced to potential industrial offtakers around Teesside as well as a CO_2 export connection and other utility connections including natural gas, water, electricity and other gases (O_2 and N_2).

3.1.4 H2Teesside demand will come from multiple end users, including fuel switching within process heat, steam raising and power generation applications.

3.1.5 The proposed capture technology is pre-combustion amine-based absorption-regeneration with an anticipated design carbon capture rate in excess of 95%. The capture rate is anticipated to be secured through the Environmental Permit. H2Teesside will connect via a short CO_2 export connection to NEP infrastructure on

the NZT site to the east of the Main Site A. Based on current projections, H2Teesside will have the capacity to continuously export 1.42 Mt of dehydrated and compressed CO_2 per year per Phase, or 2.84 Mt/year once both phases are operational (100% utilisation) with no temporary CO_2 storage required on Site.

3.1.6 At this stage in the design of the Proposed Development, there are still options being considered for various components. The design of the Proposed Development incorporates a necessary degree of flexibility to allow for the future selection of the preferred layout at the Main Site, as well as routing of the hydrogen pipeline and other connections. This will evolve as the design and commercial agreements progress throughout the preparation of the Application.

3.1.7 The Rochdale Envelope approach has been adopted to ensure that a worst case in terms of design parameters, proposed development extents and options has been considered at the EIA Scoping stage. It is expected that the current optionality would be reduced, and preferred options confirmed prior to submission of the Application, and the Rochdale Envelope used and assessed will be narrowed accordingly.

3.1.8 In addition, some of the design aspects and features of the Proposed Development cannot be confirmed until the Engineering, Procurement and Construction (EPC) Contractor has been appointed. For example, the building sizes and exact location may vary depending on the contactor selected and their specific configuration and selection of plant. Therefore, focused use of the Rochdale Envelope approach will continue to be adopted to define appropriate parameters for use in the EIA.

3.1.9 The following sections describe the Proposed Development in more detail as required for the purposes of this EIA Scoping Report and provide where possible a brief description of any optionality still being considered by the Applicant for each element.

3.2 Components of the Proposed Development

Hydrogen Production Facility – The Main Site

3.2.1 The description of the components of the Proposed Development at the Main Site below applies regardless of whether Main Site A or Main Site B is selected. However, the configuration of the various components within the Main Sites is subject to ongoing studies and dependant on the final technology and site selected.

3.2.2 The Hydrogen Production Facility will be designed taking account of Best Available Techniques as set out in the UK Government's guidance on emerging techniques for hydrogen production with carbon capture (Environment Agency, 2023).

3.2.3 H2Teesside will utilise natural gas, which will first be pre-reformed with steam over a catalyst bed to break down higher hydrocarbons to primarily carbon oxides and hydrogen. This syngas will then be reformed further using pure O_2 and more steam over catalysts in an Auto Thermal Reformer (ATR).

3.2.4 After cooling, the syngas will be reacted in water-gas shift reactors to generate H_2 and CO_2. The CO_2 will be removed from the gas via scrubbing with amine, which will

be regenerated to yield a CO_2 stream that will be compressed, dehydrated, and then exported utilising NEP infrastructure on the NZT site to the east of the Main Site. The captured CO_2 will be further compressed by NEP to be in dense phase for transportation and will be exported using existing infrastructure to the NEP Endurance store beneath the North Sea. The infrastructure required for export and storage (the high-pressure compression plant and CO_2 export pipeline) is subject to separate consent, including through the NZT DCO Project (for which DCO examination has now closed and a decision is anticipated in early May 2023).

3.2.5 The resulting low-carbon H_2 will be purified to >98 mol% H_2 and compressed and conditioned before exporting via the new proposed purpose-built hydrogen pipeline system to transport the H_2 to offtakers located in the Teesside region.

3.2.6 Steam is required at various stages of the process. Steam is raised in the ATR reformed gas boilers. Steam is then sent to the steam turbine generator (STG) where it is consumed for power generation to power the facility. The power generated by the steam turbine generator will not exceed 50 MW for each phase of the Proposed Development. The remaining saturated steam is used to heat several process streams: in the heater, O_2 preheater, process condensate heater and the CO_2 dryer.

Production Capacity

3.2.7 Production is expected to build during the initial 12-18 months of operation in line with offtaker demand. The peak H_2 export rate for each 600 MWth Phase is expected to be 22,175 kg/hr and the peak CO_2 export rate is 161,710 kg/hr. For Phase 1 and 2 combined this would equate to approximately 44,350 kg/hr peak H_2 production and export and 323,420 kg/hr CO_2 export.

3.2.8 Once commissioned and operational, the Production Facility will be designed to operate at all times, twenty-four hours a day, seven days per week until decommissioning, with brief exceptions for planned outages such as for maintenance and repair.

3.2.9 A schematic of the H_2 production process is provided at Plate 3-1 below.

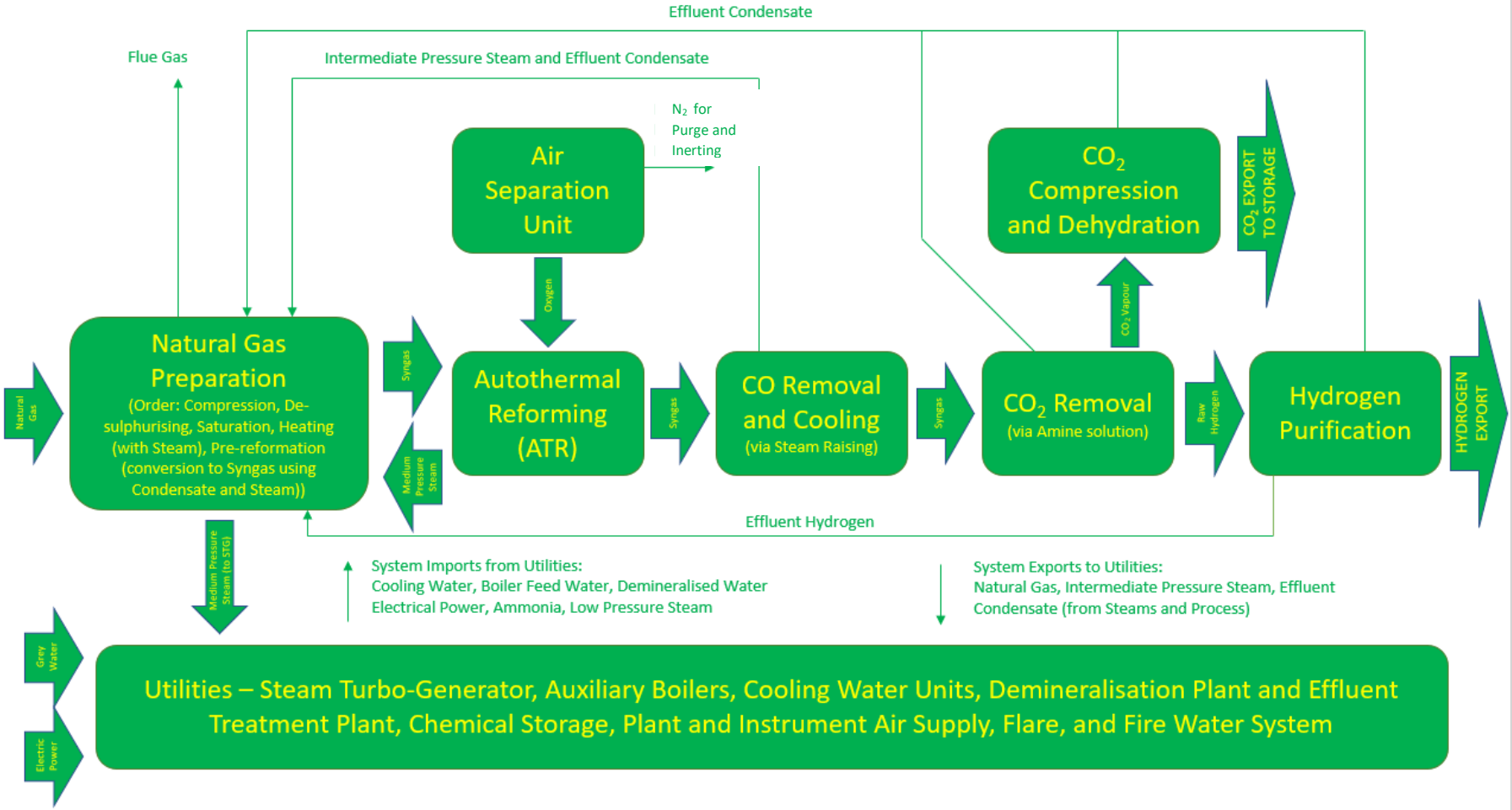

Plate 3-1: H2Teesside Blue Hydrogen Indicative Process Schematic

Note: if O_2 and N_2 are supplied by offsite sources, no ASU will be required.

3.2.10 An outline description of the process infrastructure required for the operation of the Production Facility is presented below. Details on the likely additional infrastructure that would be installed as part of Phase 2 is outlined in Section 3.13.

- A new Above Ground Installation (AGI) on the Main Site to receive natural gas which is compressed and pre-treated for use in the reforming process;
- A Hydrogen Unit (also called an ATR) where the main process of reforming occurs, fitted with Selective Catalytic Reduction (SCR). The Hydrogen Unit also includes the following component units;
  - pre-treatment to remove sulphur species;
  - pre-Reformer to reform longer hydrocarbons to methane, H_2 and CO;
  - shift reactors for conversion of carbon monoxide (CO) to H_2 and CO_2 and heat recovery in the form of steam for reuse in the process;
  - CO_2 absorbers to separate the majority of the CO_2 from the syngas mixture;
  - compressors to increase the pressure of the CO_2 prior to drying (dehydration);
  - compressors where raw H_2 is recycled for input back into the natural gas feed for pre-treatment; and
  - a methanator or Pressure Swing Adsorber (PSA) where raw H_2 is further purified and dehydrated and prepared for export to the pipeline networks, after passing through a compressor to achieve the required pressure of 40 bar and cooled to 30 degrees Celsius for export.

3.2.11 In addition, the following ancillary infrastructure may be required for the Proposed Development:

- **Air Separation Units** for the compression and separation of air, which is passed through a rectification column to produce O_2 for use in the ATR. Also includes provision of liquid oxygen and liquid nitrogen storage for back up. The Applicant is also looking at options to utilise O_2 from BOC, a nearby supplier which would remove the requirement for an onsite ASU and onsite liquid storage. This is subject to further discussions with BOC and detailed design work.
- **Cooling Water Circulation System** including towers, pumps and circuit piping to supply cooling water where it is needed throughout the plant. This will require topping up from time to time due to losses from evaporation and blowdown.
- **Auxiliary Boilers** which will be natural gas fired and used for H_2 plant commissioning (start-up) and are not expected to be required during normal day to day operation of the plant.

- A **Steam Turbine Generator (STG)** which utilises steam produced in the process to produce electricity to power the plant. The power generated by the STG will not satisfy the total demand of the plant, therefore electrical power will be imported from the grid continuously.
- A **Source Water Pre-treatment Plant** (if required subject to the agreement with Northumbrian Water (i.e. Bran Sands WwTW) or 3rd party providers) will be used to pre-treat the source water prior to the demineralisation stage and would include Dissolved Air Flotation (DAF) in case of River Water, Ultrafiltration (UF) (for removal of fine solids), and reverse osmosis (RO) for removal of ions.
- A **Demineralisation Plant** will be used to treat water supplied to the Proposed Development Site (if used), stripped process condensate, flare knockout liquid and steam condensate from power generation and blowdown. The DMW will be pumped to all locations where it is required within the plant.
- An **Effluent Treatment Plant (ETP)**, which if required will consist of an oily water separator, neutralisation sump, and storm water sump. All oily water effluents produced by the plant will be sent to the oil water separator. Post-separation, the liquid effluent will be discharged as final to Bran Sands WwTW and the solids will be sent for disposal offsite.
- A **Flare**. Any fluid released from any high operating pressure parts of the plant during an emergency will be collected in the flare header system and sent to the flare drum where any liquid associated with the gas is separated. Fluids released from low pressure parts of the plant will be sent directly to a dedicated low pressure flare tip in the flare system. The gas from the flare drum is sent to the flare system where it is safely disposed of by combustion. The liquid collected in the drum is pumped by the flare pump to the DMW plant package.
- A **Fire Water System** consisting of a fire water tank (supplied by grey or raw water), pumps and firefighting system.
- **Chemical Storage** for additives and fuel such as aqueous ammonia (NH_3), amines and diesel, which are imported by tanker.

3.2.12 Water management options are summarised in Plate 3-2, below.

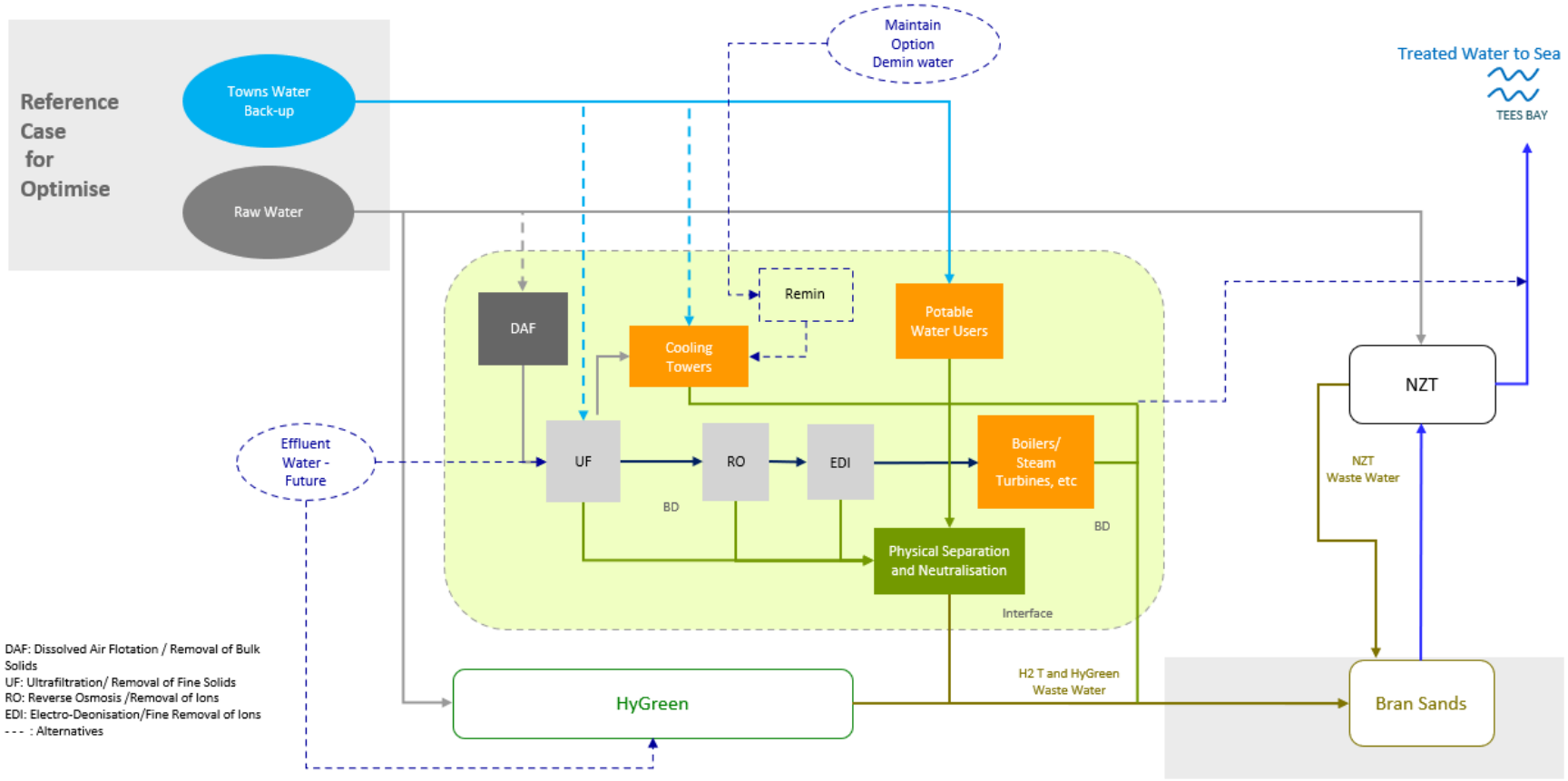

Plate 3-2: Water Management Options (Indicative)

3.2.13 In addition to the above the following components and facilities will be incorporated into the layout as required:

- Main Site entrance (main access with gated entry) as well as a secondary access point(s) and emergency access;
- internal access roads;
- vehicle turning areas;
- internal and external storage areas;
- workshop and maintenance stores;
- a control room and administration buildings;
- carparking; and
- lorry holding and security inspection areas.

3.2.14 The Production Facility will be fenced securely with some internal processes having further internal fencing installed around them as required.

3.3 CO_2 Export Connection

3.3.1 CO_2 captured and compressed at H2Teesside will be exported at an MOP of up to 28 barg and in a pipeline of up to 22" diameter to feed into the NEP CO_2 gathering system via a short CO_2 export connection pipeline between the H2Teesside Production Facility and the NEP development to the east, for high-pressure compression. CO_2 in dense-phase will then be exported off shore for geological storage offsite, at the Endurance Store in the Southern North Sea, via NEP transport infrastructure. Geological storage and CO_2 transportation from H2Teesside will be managed and operated by NEP.

3.3.2 At this early stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the CO_2 Export options for Main Sites A and B have been depicted as broad corridors (see Figures 4 and 4a, Appendix A) and it is expected that the extents of these will be refined further as the preparation of the Application progresses. At this stage in the design development, the CO_2 export connection may be entirely above or below ground or a combination of the two.

3.4 Natural Gas Supply Connection

3.4.1 Natural gas will need to be imported to the Production Facility for use in the reforming process. The exact routing of this connection is to be confirmed and subject to ongoing design, however at this stage it is anticipated that a 24" pipeline will be constructed which will connect the proposed Production Facility at the Main Site (A or B) to the wider gas supply network at a tie in point to infrastructure constructed by NZT Power as part of the NZT development.

3.4.2 At this stage in the design development, the natural gas connection may be entirely above or below ground or a combination of the two. At this stage it is assumed that

below ground construction of the Natural Gas Connection will use a combination of open-trench and trenchless technologies dependent upon engineering and environmental constraints.

3.4.3 At this early stage in the design and assessment process and in applying the Rochdale Envelope approach, the potential areas required for the gas connection options have been depicted as a broad corridor (see Figure 6: Natural Gas Connection Corridor (Main Site A – Foundry) and Figure 6a: Natural Gas Connection Corridor (extension required for Main Site B – RBT), included at Appendix A). It is expected that the extent of this will be refined further, and the routing options may be reduced as the DCO progresses.

3.5 Hydrogen Pipeline Corridor

3.5.1 A gaseous phase hydrogen pipeline network is required to connect various potential industrial offtakers across the Tees Valley to the Production Facility at either Main Site A or B.

3.5.2 Once processed to the required specification and compressed at either of the Main Sites, H_2 will be exported using the proposed hydrogen pipeline, at up to 24" diameter and with a Maximum Operating Pressure (MOP) of up to 49 barg (plus extension for Main Site B). The Hydrogen Pipeline Corridor for both sites will require a crossing of the River Tees via an HDD or MBT to export to customers to the northern side of the river. The hydrogen pipelines will run up to tie-in points with the relevant offtaker (likely to be, but not necessarily having to be) at the offtakers' site boundaries. At this stage, any works beyond tie-in points are assumed to be progressed separately by the relevant offtaker.

3.5.3 At this stage in the design development, the Hydrogen may be either above or below ground.

3.5.4 At this stage several options are being considered for crossing under the River Tees, including the construction of new trenchless crossings (in pipelines or tunnels) or the repurposing of existing pipelines or tunnels (where feasible). Although subject to ongoing studies (engineering and environmental), the construction methodology most likely to be used for the crossing of the River Tees will either be by HDD or using a MBT.

3.5.5 Various route options and construction methodologies are being considered throughout the proposed hydrogen pipeline networks for both Main Site options. These include options such as trenchless crossings (likely HDD), below ground open trench (buried), installation on existing above ground pipe racks, and repurposing and reuse of existing pipelines (where possible). However, this is subject to ongoing design work, discussions with landowners and statutory consultees as well as being informed by environmental surveys.

3.5.6 Ultimately a single route will be selected. Refinement on this optionality continues to be informed by ongoing studies and assessment work. Where possible, the route chosen will seek to avoid environmentally sensitive areas and utilise existing

established pipeline routes, and/ or the least intrusive construction methodologies (e.g. trenchless methods, as opposed to open-cut trench).

3.5.7 At the north-western extent of the hydrogen pipeline network various options are still being considered and assessed, having regard to engineering constraints and environmental sensitivities particularly around the Greatham Creek area. Table 3-1 provides a summary of the route options and construction methodologies being considered by the Applicant based on the studies carried out to date. However, the feasibility of a final route and construction methodology chosen will remain the subject of further studies which will continue as the EIA progresses. Final routing and methodologies will take into consideration the location of sensitive environmental receptors including but not limited to statutory designated sites (such as Ramsar sites, SPAs and SSSIs) within the area.

Table 3-1: Routing Optionality and Construction Methodologies

CONSTRUCTION METHODOLOGY	REQUIREMENT IN RELATION TO CURRENT ROUTING OPTIONS	COMMENTARY
Open Cut trench-buried	Currently being considered as a construction methodology for all route options (in-part).	For all of the route options there is open cut trenching (resulting in buried pipelines) proposed. The Applicant is considering alternative construction methodologies where possible to reduce the amount of open cut required, particularly in sensitive areas.
Trenchless (HDD/MBT)	Trenchless crossings (either HDD/MBT) are proposed for all of the River Tees crossing options. Currently being considered for some of the options, generally where the pipeline crosses particularly sensitive areas.	The Applicant is not considering any scenario other than trenchless for the crossing of the River Tees. The hydrogen pipeline around the Greatham Creek area interfaces with various environmentally sensitive receptors and constraints. The routing options include a section of HDD or use of existing pipe bridges to cross Greatham Creek, reducing the direct impacts that would be experienced as a result of open-cut trenching across the creek. HDD is the preferred option for crossing Greatham Creek. Whilst trenchless methods are proposed to avoid sensitive areas, open cut trenching is likely to be used within less sensitive areas.
Repurposing of existing pipelines	Currently being considered for part of one of the	At the northern extent of the Proposed Development Site (south

CONSTRUCTION METHODOLOGY	REQUIREMENT IN RELATION TO CURRENT ROUTING OPTIONS	COMMENTARY
	options (south of Seal Sands).	of Seal Sands) there is an option to repurpose and reuse an existing disused pipeline which crosses the Tees and avoids the need for a separate constructed crossing.
Utilising existing pipeline corridors and other pipeline infrastructure.	Currently being considered for various parts of the hydrogen pipeline corridor. This includes the parts of the route to the south of the Proposed Development Site, which follows the route of the existing main link line. One option for a crossing of Greatham Creek is utilising an existing pipe bridge to the west of Seal Sands Bay, though HDD is the preferred option for this location, as indicated above.	For the majority of the hydrogen pipeline corridor south of the River Tees, it is proposed to route along existing established pipeline corridors (generally above ground) where possible. Once the hydrogen pipeline crosses the River Tees (via trenchless methods) and emerges on the northern bank of the river, the preferred and most likely option will be to follow the existing link line corridor. In order to route to offtakers further north and as outlined in paragraph 3.5.6, various options are being considered for routing in proximity to and across Greatham Creek. One option for crossing Greatham Creek is to utilise an existing pipe bridge to the west of Seal Sands Bay. Either side of this, open cut trenching may be used to continue the pipeline route. As outlined above, HDD is the preferred option for the crossing of Greatham Creek; the engineering feasibility of this is being investigated.

Note: the above optionality applies to the main Hydrogen Connection Corridor only; not the Hydrogen Connection Corridor RBT Extension.

3.5.8 At this early stage in the design and assessment process and in applying the Rochdale Envelope approach, the extent of the Hydrogen Pipeline Corridors for Main Sites A and B has been depicted as broad corridors (see Figures 5 and 5a, Appendix A). In places where the Hydrogen Pipeline Corridor includes areas of existing operational land or facilities (e.g. in the area around Wilton International) this does not imply that the Applicant is proposing to carry out works or lay pipelines in all of these areas;

at this stage, the corridor covers a wider area, and will do so until the specific routes, offtakers, and construction methodologies are defined as the design progresses. The extent of the Hydrogen Pipeline Corridors and the routing options will be refined as the preparation of the Application progresses.

3.6 Electrical Connection

3.6.1 There is existing electrical infrastructure in the area which comprises a combination of overhead and lower voltage underground cables that serve the local area and other industrial users located in proximity to the Proposed Development Site.

3.6.2 Although the Production Facility is capable of supplying a proportion of its energy requirements onsite via the STG, an alternative electricity supply will also be required. Various options are being considered which include a connection to existing and proposed 66 kilovolt (kV) substations at Teesworks or the NEP electrical connection. There is also potential to connect at other substations locally such as Lackenby, Grangetown and Kinkerdale. The final decision on substation choice will be subject to design development and further work based on constructability and electrical network resilience and capacity.

3.6.3 The size, timing and location of any connection will be determined in consultation with the relevant stakeholders. In addition to the potential connection options with Teesworks, enquiries have been submitted to NPG for at least 100 MW capacity, and potential synergies with NZT are being explored. These discussions will be ongoing as the preparation of the Application progresses.

3.6.4 At this stage in the design development, the electrical connection may be entirely above or below ground or a combination of the two.

3.6.5 At this early stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the electrical connection options for Main Sites A and B have been depicted as broad corridors (see Figures 7 and 7a, Appendix A) and it is expected that the extents of these will be refined further as the preparation of the Application progresses.

3.7 Water Connections

3.7.1 Water supply and discharge connections are required for the process at the Production Facility including for cooling water purposes and discharge of treated effluent.

3.7.2 There are two potential alternative sources of water for the Proposed Development:

- Demineralised water (DMW) from Wilton International which will not require onsite source water pre-treatment; or
- Reclaimed water (treated effluent) from Northumbrian Water Ltd's (NWL) Bran Sands Wastewater treatment plant – which might require further pre-treatment for use in the H2Teesside process either at Bran Sands (via a commercial agreement with NWL) or via a dedicated treatment plant at the Main site.

3.7.3 Effluent from the H_2 production process the process will need to be either:

- treated at the Main site and discharged via the NZT effluent outfall under a commercial arrangement with NZT; or
- sent to the Bran Sands Wastewater treatment plant by a return pipeline and discharged via NWL's permitted discharge to the Dabholm Gut.

3.7.4 The Water Connections Corridor therefore includes a pipeline route(s) between Main Sites A or B and Bran Sands WwTW as well as a potential connection to NZT and a potential route for a DMW connection between the Main Site and Wilton International. At this stage in the design development, the water connections may be entirely above or below ground or a combination of the two.

3.7.5 At this early stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the water connection options currently proposed for Main Site A and B have been depicted as broad corridors (see Figures 8 and 8a, Appendix A). It is expected that the extents of these will be refined further as the preparation of the Application progresses.

3.8 Other Gases Connections

Other gas connection pipelines may be required for the transportation of compressed O_2 and N_2 for use at the Production Facility. At this early stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the other gases connection options currently proposed for Main Site A and B have been depicted as a broad corridor (see Figures 9 and 9a, Appendix A). It is expected that the extents of this these will be refined further as the preparation of the Application progresses. At this stage in the design development, the connections for other gases may be entirely above or below ground or a combination of the two.

3.9 Hydrogen Storage

3.9.1 On-site storage of H_2 is not included within the Proposed Development. Should there be a requirement for H_2 storage on-site, it is expected that this would be small scale pressurised storage and would need to be permitted separately.

3.9.2 Off-site storage of H_2 is not included within the Proposed Development for the DCO. Should there be the requirement for off-site storage, it is expected that these would be owned and operated by a third-party provider who would be responsible for any consenting requirements.

3.10 Material Storage

3.10.1 Chemicals required for the operation of the Production Facility will need to be stored and used at the Main Site. Some of these materials may be classed as hazardous. Where any substance could pose a risk to the environment through its uncontrolled release (e.g. through the surface water drainage system) appropriate containment

facilities will be used including (but not limited to) bunds and concrete surfaces appropriately designed and sized for their intended use.

3.10.2 An inventory of materials to be stored on the Main Site will be finalised through the detailed design. However, where storage of hazardous materials, individually or in-combination exceeds the relevant thresholds, separate permissions will be sought from the Hazardous Substances Authority, Health and Safety Executive (HSE) and Local Planning Authority (LPA) for their storage, under the Control of Major Accident Hazards (COMAH) and Hazardous Substance Consent regimes respectively. All chemical storage will be regulated by the Environment Agency through an environmental permit that will be required for the operation of the Proposed Development.

3.11 Access

3.11.1 Access to the Main Sites during the construction phase for HGV construction traffic is likely to be via the existing access road from the A1085 via the former Redcar Steelworks entrance. This route will also be used during operation for staff and other site traffic. This applies to both Main Site A and Main Site B.

3.11.2 Options for transportation of Abnormal Indivisible Loads (AILs) during construction using the local ports are still being considered. The nearest commercial port to the Proposed Development Site is Teesport which could be used for the import of containerised equipment or modular plant. Use of modular plant would minimise the number of HGV movements required for their transportation. The use of the existing wharf at RBT for transportation of abnormal loads will also be considered for modular plant. Consideration will be given to the appropriate port and any required AIL routes during the design process.

3.11.3 The Applicant is also exploring the use of railways for the import of materials to the Main Site and associated connection corridors.

3.11.4 Construction access routes for the hydrogen pipeline and connection corridors are yet to be defined. However, it is assumed that laydown areas will be identified at suitable locations along the pipeline routes located north of the River Tees to ensure disturbance is kept to a minimum.

3.11.5 It is likely that the Main Site construction laydown areas will be utilised during the construction of the sections of the Hydrogen Pipeline Corridor and other connections in proximity (e.g. Water Connections, Natural Gas Connection and Electricity Connection (south of the River Tees)). Currently it is proposed that laydown areas for the Main Site construction will be located on land within, to the east and west of the Main Sites (see Figures 3 and 3a, Appendix A), thereby minimising the distance to the Main Site. Other laydown areas for pipeline construction required will be located within the connection corridors and will be identified in the application for development consent.

3.12 Site Clearance and Remediation

3.12.1 The Main Sites will require site clearance and remediation prior to the construction of the Proposed Development, to make it fit for purpose. Main Site A is located within land owned by Teesworks which is brownfield land. This land currently contains some above and below ground structures and redundant services associated with the former Redcar Steelworks and earlier development on the site.

3.12.2 It is assumed at this stage that the removal of those structures, clearance and remediation of Main Site A to a suitable development platform level will be undertaken by Teesworks prior to the commencement of construction of the Proposed Development and that Teesworks will obtain the necessary consents and permits to do this work.

3.12.3 The ES will not include an assessment of the likely significant environmental effects of undertaking required 'enabling works' on Main Site A (including demolition and remedial works) as these will be undertaken by Teesworks. For Main Site B, demolition and remedial works may be undertaken by the Applicant and will require assessment. For both Main Sites A and B the impacts of the construction of the Proposed Development by the Applicant's contractors will need to be assessed.

3.12.4 Ground conditions vary across Main Site A depending on the historical uses. Accordingly, a programme of Ground Investigation (GI) works will be undertaken to assess these. The design and extent of these investigations is in progress and will provide the necessary information to inform the requirements of any future Environmental Permit as well as the design and layout of the Proposed Development.

3.12.5 This investigation will also inform if changes to site levels are required to facilitate the construction of the Proposed Development. For the purposes of the environmental assessments (including the Landscape and Visual Impact Assessment (LVIA)) a maximum ground level will be assessed as this represents the worst case for landscape and visual impact. The Flood Risk Assessment (FRA) will identify the minimum ground level which minimises the risk of flooding.

3.12.6 Similarly to Main Site A, remediation will be required at Main Site B prior to construction; it will either be the subject of a separate planning application under the Town and Country Planning Act 2017 or consented via the DCO. As such it will be assessed in the ES if Main Site B is selected. The scope of remediation requirements is subject to further studies, but it is assumed that some demolition will be required and that a remediation strategy would specify requirements for localised stripping of material, ground infilling and raising supported by testing and material replacement, when necessary. This would include identification and targeted removal of any contaminated material. The land level at Main Site B may need to be raised to achieve an acceptable ground elevation to minimise the risk of flooding as part of site remediation works.

3.13 Construction Programme and Management

3.13.1 Subject to being granted development consent it is anticipated that construction would commence in mid-2025 at the earliest with enabling works and site clearance (by Teesworks for Main Site A), closely followed by construction of the Phase 1 of the Production Facility including main civils, mechanical and electrical work, hydrogen pipeline and connections construction.

3.13.2 The Construction of Phase 1 is likely to last approximately two years. Phase 2 works would commence thereafter (approximately late 2027/ early 2028) and last a further two to three years, with overall construction expected to be completed by late 2029 or early 2030. The duration of the phase 2 construction might be extended when compared to phase 1 due to potential overlaps in phase 1 commencement of operation and construction activities for phase 2, requiring management of simultaneous operations and minimisation of risks and impacts arising from that.

3.13.3 Phase 1 construction works would include the Production Facility at the Main Sites options (Phase 1 components) and the various utility connections required including CO_2 export pipeline to NEP infrastructure, the natural gas, water and electricity connections. Phase 1 would also include the construction of the majority of the hydrogen pipeline except for short additional spurs of the hydrogen pipeline which will be constructed as part of Phase 2.

3.13.4 Phase 2 construction at the Main Site would include the infrastructure required for the second Hydrogen Unit train to increase the capacity of the Production Facility by a further 600 MWth. The additional Phase 2 infrastructure would be constructed within the Main Site, adjacent to the Phase 1 previously constructed infrastructure, and is likely to include (subject to detailed design):

- an additional Hydrogen Unit (up to 600 MWth);
- an additional cooling water circulation system;
- an additional ASU (if required);
- expansion of the demineralisation plant as required;
- additional pipe racking as required within the processing plant as well as to connect to the flare (constructed as part of Phase 1); and
- short additional spurs of the hydrogen, natural gas and electricity pipeline connections.

3.13.5 Suitable safety distances will be included within the site layout to facilitate the construction of Phase 2 whilst retaining full operation of Phase 1.

3.13.6 The ES will provide further details of the proposed construction activities and their anticipated duration, along with an indicative programme for each phase of the works. An outline construction programme is provided in Table 3-2.

3.13.7 The ES will be accompanied by a framework Construction Environmental Management Plan (CEMP), which will describe the specific mitigation measures to be followed to reduce impacts from construction related activities including:

- construction traffic (including parking and access requirements);
- earthworks;
- noise and vibration;
- dust generation; and
- waste generation.

3.13.8 The detailed CEMP will be secured by a requirement of the DCO and will identify the relevant procedures to be adhered to throughout construction. Where possible at this stage potential design and impact avoidance measures relevant to each topic has been included within the each of the technical chapters outlined in Section 6 of this report.

3.13.9 Contracts with companies involved in the construction works will incorporate environmental control, health and safety regulations and current guidance, including all necessary permits, with the intention that construction activities are sustainable and that all contractors involved with the construction stages are committed to agreed best practice and meet all relevant environmental legislation including: Control of Pollution Act 1974 (COPA), Environment Act 1995 and 2021, Hazardous Waste (England and Wales) Regulations 2005, and Environmental Permitting (England and Wales) Regulations 2016.

3.13.10 All construction works will adhere to the Construction (Design and Management) (CDM) Regulations 2015.

3.14 Staffing

3.14.1 Based on an initial estimate, it is considered likely that construction workforce peak numbers will be approximately 3,100 people per day for both Phases 1 and 2. This includes workers associated with both the Main Site and pipeline connections. It is not likely that peak construction phases for Phase 1 and Phase 2 will overlap (see Table 3-1 above).

3.14.2 Operation workforce peak numbers will be a maximum of 85 people (staff). Operations staffing will be on a shift basis to be spread over a 24-hour period. Normally staff levels will be 40-50 peak during the week, however, during 28-day maintenance periods which are likely to occur approximately every four years, there would be up to 400 people.

Table 3-2: Indicative Construction Programme to Inform the EIA

	2025				2026				2027				2028				2029				2030			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Construction Phase 1																								
Phase 1 Operation Commences																								
Construction Phase 2																								
Phase 2 Operation Commences																								

3.15 HGV Movements and Traffic

3.15.1 The principal vehicle movements are anticipated to be associated with the construction phase of the Proposed Development.

3.15.2 The volume of construction vehicles associated with the delivery of plant and the labour force has not been fully determined at this stage, but as a worst-case scenario at this stage, peak construction staff numbers are likely to be approximately 3,100 for both Phases 1 and 2.

3.15.3 This equates to approximately 2,660 two-way vehicle movements per day during the peak construction period, based upon an average car occupancy for workers of 2.33.

3.15.4 In terms of construction HGV and LGV movements there are predicted to be around 15,230 deliveries to the Main Site over the full period of construction.

3.15.5 In addition, there would also be approximately 4,330 HGV movements associated with the construction of the pipelines over the full period of construction, which equates to around 50 two-way movements per day during the peak month of construction. This includes the entire Hydrogen Pipeline Corridor, both north and south of the Tees.

3.15.6 During the operational phase of the Proposed Development, it is anticipated that there will be a maximum workforce of 85 staff, that will be required on a shift basis to be spread over a 24-hour period. Staff will travel to and from work in a variety of directions and the ES will make reasonable assumptions about the regional distribution of journeys to and from the Proposed Development Site.

3.15.7 Natural gas will be delivered by pipeline and other operational and maintenance consumables will be managed to be kept as low as is reasonably practicable thereby minimising traffic movements.

3.16 Lighting

3.16.1 Some external lighting will be required to ensure the Production Facility can operate safely at all times. An Indicative Lighting Strategy will be prepared and submitted as part of the Application. This will then inform the preparation of an external lighting scheme under a DCO requirement which will be designed in accordance with relevant standards, such as the Guidance Notes for the Reduction of Obtrusive Light (2021) published by the Institute of Lighting Engineers and/or Chartered Institution of Building Services Engineers (CIBSE) requirements, as appropriate. This will ensure that safe working conditions are provided whilst reducing light pollution and the visual impact on the local environment.

3.17 Environmental Management During Operation

3.17.1 The Production Facility will require an Environmental Permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016 so that any impacts of emissions to air, soil, surface and groundwater, to the environment and human health will be minimised and avoided where possible.

3.17.2 The Proposed Development will be operated in line with appropriate standards and the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development Site is operating to the appropriate standard.

3.17.3 Any requirements for sampling and analysis of pollutants will be undertaken where required in accordance with the Environmental Permit.

3.18 Decommissioning

3.18.1 The Production Facility will have a design life of 25 years once Phase 1 is constructed and total of 28 years once Phase 2 is constructed and operational. However, the operational life could be longer subject to market conditions and plant condition. At the end of its operational life, the most likely scenario would be that the Proposed Development would be shut down, with all above ground structures on the Main Site removed, and the ground remediated as required to facilitate future re-use. The Applicant will assess at that time whether any infrastructure should be retained for future use. The same timescales would apply for the hydrogen pipeline and utility connections.

3.18.2 A Decommissioning Plan (including Decommissioning Environmental Management Plan) would be produced and agreed with the Environment Agency as part of the Environmental Permitting surrender process. The Decommissioning Environmental Management Plan would consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated.

It is often the case that sufficient information is not available at the time of assessment to inform an assessment of decommissioning impacts, however, this will be assessed where possible within the ES. It is generally assumed that the environmental effects associated with the decommissioning phase would be no worse than those experienced during construction and these will be assessed on this basis.

4.0 CONSIDERATION OF ALTERNATIVES

4.1 Introduction

4.1.1 The EIA Regulations require that an ES should include an outline of the reasonable alternatives that have been studied by the Applicant and an indication of the main reasons for its choices, taking into account the likely significant environmental impacts of each alternative. Under the EIA Regulations there is no requirement to assess alternatives, only a requirement to provide a review of those alternatives that have been considered.

4.2 The Do Nothing Alternative

4.2.1 The 'Do Nothing' alternative would be where the Proposed Development would not be developed, meaning that the opportunity for industrial offtakers to transition utilising H_2 piped directly to their facilities would not be readily available and they may continue to use or opt for more carbon intensive alternatives. This would put at risk the UK Government's policy ambition of 10 GW of low carbon H_2 production by 2030.

4.2.2 In addition, carbon capture is recognised as being essential to seeing through commitments government has made to achieving net zero. The Proposed Development through its links to the NZT/ NEP development will contribute to and facilitate the path towards net zero in the UK. The 'Do Nothing' alternative scenario is generally discounted on the basis that there is a clear need for the Proposed Development. This will be outlined in more detail in Preliminary Environmental Information (PEI) Report and subsequent ES.

4.3 Site and Design Alternatives

4.3.1 The Applicant, based on the site selection process and the information and data which is emerging to inform these decisions, is progressing concept designs for two Main Site Options – Main Site A (Foundry) and Main Site B (RBT). The location of the Proposed Development Site in Teesside provides proximity to both existing and potential future users of low carbon hydrogen and access to the off-shore Endurance carbon store via NEP's nearby infrastructure.

4.3.2 Various factors are influencing the site selection process; in particular, process safety considerations. Both Main Site locations are sufficiently remote from any safety sensitive receptors, thereby minimising process safety risks. In addition, both Main Site options can be easily connected to the required infrastructure (including natural gas, water and electrical).

4.3.3 Main Site A is adjacent to the NEP onshore facilities at NZT, thereby simplifying the CO_2 connection corridor routing. Main Site A also presents an opportunity to consider locating other proposed bp projects in Teesside (such as HyGreen, a proposed green hydrogen project) adjacent to the Proposed Development Site, allowing synergies between the projects to be explored.

4.3.4 Main Site B is also in close proximity to NEP onshore facilities at NZT. It is closer to PD Ports than Main Site A, potentially enabling easier transportation by barge, and reducing the requirement for transport by road. There are no significant underground obstructions within Main Site B; as such, there is minimal requirement for extensive excavation works.

4.3.5 Alternative development layouts within the Main Site are also being evaluated for both Main Sites A and B. It is proposed that other project alternatives will be considered, and options refined as the Application progresses including (but not limited to):

- the layout of the Proposed Development including the configuration of the structures and buildings within the chosen Main Site;
- the design of the Proposed Development (e.g. the solution chosen in terms of O_2 and N_2 (whether sourced locally or requiring an ASU));
- the options and refinement of routes carried forward for connection to the Natural Gas and Electricity Grids within the currently proposed connection corridors;
- the options and refinement of routing for the hydrogen pipeline within the currently proposed Hydrogen Pipeline Corridor; and
- the options and refinement of routing for the Water Connection within the currently proposed Water Connections Corridor.

4.3.6 Where alternatives are examined and assessed during the pre-application process, details of the options and reasons for selection (or otherwise) will be included within the ES for the Proposed Development.

4.3.7 Where, at the time of application, alternatives still exist for any particular element of the Proposed Development, the assessments to be included within the EIA and presented in the ES will consider and assess the 'worst case' impacts, in accordance with the Rochdale Envelope principle outlined in PINS Advice Note Nine: Rochdale Envelope (Planning Inspectorate, 2018).

5.0 PLANNING POLICY AND NEED

5.1 Introduction

5.1.1 This chapter of the EIA Scoping Report provides an overview of the planning and energy policy of relevance to the Proposed Development, and where that policy identifies the need for the Proposed Development.

5.1.2 The application for development consent will include a Planning Statement that will set out in more detail the policy of relevance to the Proposed Development and include an assessment of how it complies with that policy.

5.1.3 The following planning and energy policy is of relevance to the Proposed Development:

- National Policy Statements (NPSs) for Energy;
- Marine Policy Statements (MPSs) and Plans;
- Government Energy and Climate Change Policy;
- The National Planning Policy Framework (NPPF); and
- Local Planning Policy.

5.1.4 These are considered in the sections below.

5.2 National Policy Statements for Energy

5.2.1 Under the PA 2008 regime, the policy framework for examining and determining applications for development consent is provided by NPSs. Section 5 of the PA 2008 allows the relevant SoS to designate NPSs setting out national policy in relation to the types of NSIPs listed at Section 14 of the Act. The NPSs are the primary policy used by the relevant SoS to examine and determine applications for NSIPs.

5.2.2 Section 104 of the PA 2008 provides that where a NPS has effect, the SoS must determine the application in accordance with the relevant NPSs and appropriate marine policy documents (if any) having regard to any local impact report produced by the relevant LPA; any matters prescribed in relation to development of the description to which the application relates; and any other matters which the SoS thinks are both "*important and relevant*" to their decision, unless this would:

- lead to the UK being in breach of its international obligations;
- be in breach of any statutory duty that applies to the SoS;
- be unlawful;
- result in the adverse impacts of the development outweighing the benefits; or
- be contrary to any condition prescribing how decisions regarding an NSIP application are to be taken.

5.2.3 Section 105 of the PA 2008 relates to decision on applications where no NPS has effect, that is, where there is no NPS in place relating to the specific type of

development. In such cases, Section 105 states that in deciding the application the SoS must have regard to any relevant local impact report produced by the relevant LPA; any matters prescribed in relation to development of the description to which the application relates; and any other matters which the SoS thinks are both important and relevant to their decision.

5.2.4 In light of recent case law, and until revised NPSs are designated which change the position (as they are anticipated to do), the Applicant recognises that those aspects of the Proposed Development which are automatically NSIP would be determined under Section 104 and those aspects which are development for which development consent is required pursuant to the Section 35 Direction would be determined under Section 105.

Current NPSs

5.2.5 Several NPSs have been designated in relation to energy infrastructure. The current energy NPSs were published in July 2011 by the SoS for the Department for Energy and Climate Change (now Business, Energy and Industrial Strategy). The designated NPSs include an overarching NPS setting out general policies and assessment principles for energy infrastructure and a number of technology specific NPSs. The NPSs considered to be of relevance to the Proposed Development are:

- the Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC), 2011a);
- the NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (DECC, 2011b); and
- the NPS for Electricity Networks Infrastructure (EN-5) (DECC, 2011c).

5.2.6 Part 3 of EN-1 *'The need for new nationally significant energy infrastructure projects'* defines and sets out the *'need'* for nationally significant energy infrastructure. Paragraph 3.1.1 states that the UK needs all types of energy infrastructure covered by the NPS to achieve energy security at the same time as dramatically reducing greenhouse gas (GHG) emissions. Paragraph 3.1.2 goes on to state that it is for industry to propose the type of energy infrastructure and that the Government does not consider it appropriate for planning policy to set targets for or limits on different technologies.

5.2.7 While the current NPSs for energy infrastructure do not include policy specifically relating to H_2 infrastructure, they do include policy that is of relevance to the Proposed Development.

5.2.8 Part 4 of EN-1 sets out several '*assessment principles*' that must be taken into account by applicants and the SoS in preparing and determining applications for nationally significant energy infrastructure. General points include (paragraph 4.1.2) the requirement for the SoS, given the level and urgency of need for the infrastructure covered by the energy NPSs, to start with a presumption in favour of granting consent for applications for energy NSIPs. This presumption applies unless any more specific and relevant policies set out in the relevant NPS clearly indicate

that consent should be refused or any of the considerations referred to in Section 104 of the PA 2008 (noted above) apply.

5.2.9 Other assessment principles include the matters to be covered within any ES; the Habitats and Species Regulations; the consideration of alternatives; criteria for *'good design'*; grid connection; consideration of CCS; climate change adaptation; pollution control and environmental regulatory regimes; safety; hazardous substances; health; common law and statutory nuisance and security, amongst others.

5.2.10 Part 5 of EN-1 deals with the '*Generic Impacts*' of energy infrastructure. These include impacts that occur in relation to all or most types of energy infrastructure in addition to others that may only be relevant to certain technologies. Paragraph 5.1.2 stresses that the list of impacts is not exhaustive and that applicants should identify the impacts of their projects in the ES in terms of both those covered by the NPSs and others that may be relevant. Generic impacts include land use; socio economics; air quality and emissions; noise and vibration; dust, odour, artificial light, steam and smoke; traffic and transport; civil and military aviation; biodiversity and geological conservation; historic environment; landscape and visual; water quality and resources; flood risk and waste, amongst others. In relation to each of the generic impacts listed within Part 5, guidance is provided on how the Applicant should assess these within their application and the considerations that the SoS should consider in decision-making.

5.2.11 In addition to the assessment principles and generic impacts covered by EN-1, NPSs EN-4 and EN-5 set out the factors (e.g. those influencing site selection) and *'assessment and technology specific'* considerations to be considered in the preparation and assessment of applications for gas pipelines and electricity network infrastructure, including relevant environmental matters.

Draft Revised NPSs

5.2.12 Draft revised NPSs for energy infrastructure were published by the Government for consultation in September 2021, partly in response to the Government's legally binding commitment to achieve net zero in terms of GHG emissions by 2050. No date has been set for the designation of the revised energy NPSs. While the current suite of NPSs for energy infrastructure remain relevant Government policy and have effect for NSIP applications for the purposes of the PA 2008, it is considered that the draft revised NPSs are also a matter that is important and relevant to the Proposed Development. The following draft revised NPSs are relevant:

- Draft Overarching NPS for Energy (EN-1) (BEIS, 2021a);
- Draft NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (BEIS, 2021b); and
- Draft NPS for Electricity Networks Infrastructure (EN-5) (BEIS, 2021c).

5.2.13 Paragraph 1.3.3 of draft EN-1 states that where the need for a particular type of energy infrastructure set out in paragraph 1.3.2 is established by the NPS, but that type of infrastructure is outside the scope of one of the technology specific NPSs, EN-

1 will have effect alone and will be the primary basis for the SoS's decision making. It goes onto state that:

"This will be the case for, but is not limited to, hydrogen pipeline and storage infrastructure, Carbon Capture Storage (CCS) pipeline infrastructure and other forms of low carbon generation infrastructure not included in EN-2 or EN-3."

5.2.1 As confirmed at Section 1.0 of this EIA Scoping Report, on the 22nd December 2022, the SoS issued a Direction under Sections 35(1) and 35ZA that the Proposed Development is to be treated as development for which development consent is required. Paragraph 1.3.5 of draft EN-1 clarifies that EN-1, in conjunction with any relevant technology specific NPS, will be the primary policy for the SoS's decision making on projects in the field of energy for which a direction has been given under Section 35.

5.2.2 Draft revised EN-1 includes new policy in relation to H_2 infrastructure and confirms (paragraphs 3.4.11 to 3.4.15) that "*The government is committed to developing low carbon hydrogen, which will be critical for meeting the UK's legally binding commitment to achieve net zero by 2050, with the potential to help decarbonise vital UK industry sectors and provide flexible deployment across heat, power and transport"* and there is an "*urgent need for all types of low carbon hydrogen infrastructure*".

5.2.3 It is noted that the Government will release updated drafts of the Energy National Policy Statements shortly after submission of this Scoping Report. These will be taken into account by the Applicant moving forward through development of the Proposed Development.

5.3 Marine Policy Statements & Plans

5.3.1 Section 104 of the PA 2008 requires the SoS to have regard to "…*the appropriate marine policy documents…*" relevant to the NSIP. It is considered that such documents would also be important and relevant considerations under section 105. A number of elements of the Proposed Development involve works within the UK Marine Area, under the tidal River Tees. The relevant marine policy documents are the UK MPS (HM Government, 2011) and the North East Inshore and North East Offshore Marine Plan (Defra, 2021).

UK Marine Policy Statement (March 2011)

5.3.2 The UK MPS, adopted in March 2011, provides the policy framework for preparing marine plans and taking decisions affecting the marine environment. It has been prepared and adopted for the purposes of Section 44 of the Marine and Coastal Access Act 2009 and is intended to sit alongside terrestrial consenting regimes, including the PA 2008 regime. The MPS was subject to updates in September 2020 relating to how references to EU law should be interpreted from 1 January 2021 following the UK's withdrawal from the EU.

5.3.3 Chapter 3 sets out the policy objectives for key activities that take place in the marine environment. Section 3.3 deals specifically with 'Energy production and infrastructure development'. Paragraph 3.3.1 notes that a secure, sustainable and affordable supply of energy is of central importance to the economic and social well-being of the UK. Paragraph 3.3.4 sets out issues that decision maker should consider when examining and determining applications for energy infrastructure. Those of relevance to the Proposed Development, which will connect to a Carbon Capture, Usage and Storage (CCUS) cluster in Teesside, include:

- The national level of need for new energy infrastructure, as set out in the Overarching NPS for Energy (EN-1);
- The positive wider environmental, societal and economic benefits of CCS as key technologies for reducing CO_2 emissions;
- That the physical resources and features that form oil and gas fields or suitable sites for CO_2 storage occur in relatively few locations and need first of all to be explored for and can then only be exploited where they are found; and
- The UK's programme to support the development and deployment of CCS clusters and in particular the need for suitable locations that provide for the permanent storage of CO_2.

North East Inshore and North East Offshore Marine Plan (June 2021)

5.3.4 Marine plans are intended to set out detailed policy and spatial guidance for a particular area. The UK is divided into several marine planning regions with associated plan authorities that are responsible for preparing marine plans. In England the MMO is the plan authority. Marine plans are a material consideration.

5.3.5 The Proposed Development Site lies within the 'North East Inshore Marine Area', which stretches from Flamborough Head in Yorkshire to the Scottish Border. The Plan Area has three main tidal rivers, including the River Tees.

5.3.6 The North East Marine Plan is intended to provide a strategic approach to decision-making, considering future use and providing a clear approach to managing resources, activities and interactions within the area.

5.3.7 Policy NE-CCUS-3 is of relevance to the Proposed Development as it supports proposals associated with the deployment of low carbon infrastructure for industrial clusters such as that being proposed on Teesside as part of the East Coast Cluster being advanced by the NEP. The policy states:

"The government identified potential regional clusters which can be utilised for low carbon development in the Delivering clean growth: CCUS Cost Challenge Taskforce report and the subsequent plan, The UK carbon capture, usage and storage (CCUS) deployment pathway: an action plan. NE-CCUS-3 supports the development of low carbon industrial clusters where low carbon infrastructure, including carbon capture, usage and storage technologies could be deployed. Encouraging developments

associated with industrial clusters aims to reduce the capital costs of deploying carbon capture, usage and storage, maximising the economies of scale."

5.4 Energy and Climate Change Policy

5.4.1 Other matters that the SoS may consider important and relevant include recent UK energy and climate change policy.

5.4.2 The Proposed Development will support the overarching objective of the Government to continue transitioning the UK to a low carbon economy and meeting the legally binding target of net zero GHG emissions by 2050. The important role that H_2, coupled with CCS/ CCUS, has to play in achieving this transition is confirmed by recent Government energy and climate change policy including:

- The Ten Point Plan for a Green Industrial Revolution (HM Government, 2020);
- The Energy White Paper (BEIS, 2020);
- Industrial Decarbonisation Strategy (BEIS, 2021d);
- North Sea Transition Deal (BEIS, 2021e);
- UK Hydrogen Strategy (BEIS, 2021f);
- Net Zero Strategy: Build Back Greener (BEIS, 2021g); and
- British Energy Security Strategy (BESS) (HM Government, 2022).

5.4.3 These policy documents are considered below.

<u>The Ten Point Plan for a Green Industrial Revolution (November 2020)</u>

5.4.4 'The Ten Point Plan for a Green Industrial Revolution – Building back better, supporting green jobs, and accelerating out path to net zero', was published on 18 November 2020 and is aimed at delivering a 'Green Industrial Revolution' in the UK, with the foreword by the Prime Minister stating that the Plan will aim to mobilise £12 billion of government investment and potentially three times as much from the private sector, to create and support up to 250,000 green jobs.

5.4.5 The Introduction to the Ten Point Plan (page 6) states:

"We will generate new clean power with offshore wind farms, nuclear plants <u>and by investing up to half a billion pounds in new hydrogen technologies</u>. We will use this energy to carry on living our lives, running our cars, buses, trucks and trains, ships and planes, and heating our homes while keeping bills low. And to the extent that we still emit carbon, we will pioneer a new British industry dedicated to its capture and return to under the North Sea. Together these measures will reinvigorate our industrial heartlands, creating jobs and growth, and pioneering world-leading SuperPlaces that unite clean industry with transport and power …

The cumulative effect of this plan will be to reduce the UK emissions by 180 million tonnes of carbon dioxide equivalent (Mt CO_2 e) between 2023 and 2032, equal to taking all of today's cars off the road for around two years…." [our underlining]

5.4.6 The 'Ten Points' of the Plan are summarised at page 7. Point 2 'Driving the Growth of Low Carbon Hydrogen' is covered at pages 10 to 11 and states (page 10):

"Working with industry the UK is aiming for 5GW of low carbon hydrogen production capacity by 2030. Hubs where renewable energy, CCUS and hydrogen congregate will put our industrial 'SuperPlaces' at the forefront of technological development."

5.4.7 It highlights how 5 GW of low carbon H_2 production by 2030 could see the UK benefit from around 8,000 jobs across its industrial heartlands. This will be supported by a range of measures, including a £240 million Net Zero Hydrogen Fund. It goes onto state that (page 10):

"Producing low carbon hydrogen at scale will be made possible by carbon capture and storage infrastructure, and we plan to grow both of these new British industries side by side so our industrial 'SuperPlaces' are envied around the world." [our underlining]

5.4.8 Point 8 *'Investing in Carbon Capture, Usage and Storage'* (pages 22 and 23) identifies the ambition to capture 10 Mt of CO_2 a year by 2030 and the Government's commitment to invest up to £1 billion to support the establishment of CCUS in four industrial clusters in areas such as the North East and goes onto state how CCUS will be developed alongside H_2 production in these locations.

5.4.9 The Proposed Development will help deliver the Ten Point Plan by delivering low carbon H_2 production at scale within what is an emerging CCUS cluster on Teesside.

The Energy White Paper (December 2020)

5.4.10 The Energy White Paper 'Powering our Net Zero Future' ('EWP'), was presented to Parliament in December 2020 and builds on the Ten Point Plan. At the core of the EWP is the commitment to tackle climate change and achieve net zero. The EWP seeks to put in place a strategy for the wider energy system that transforms energy, supports a green recovery and creates a fair deal for consumers (page 4). As with the Ten Point Plan, the EWP confirms the Government's support for new H_2 technologies and CCUS drawing upon the resources provided by the North Sea.

5.4.11 The Government estimates (Introduction, page 15) that the measures in the EWP could reduce emissions across power, industry and buildings by up to 230 Mt CO_2 in the period to 2032 and enable further savings in other sectors such as transport. In doing so, these measures could support up to 220,000 jobs per year by 2030. These figures include the energy measures from the Ten Point Plan as well as additional measures set out in the EWP. However, the EWP recognises that more will need to be done to meet key milestones on the journey to net zero.

5.4.12 The EWP (pages 16 to 17) provides an overview of the Government's key commitments to put the UK on a course to net zero. These are grouped under several headings and include:

"SUPPORT A GREEN RECOVERY FROM COVID-19 …

- *Increasing the ambition in our Industrial Clusters Mission four-fold, aiming to deliver four low-carbon clusters by 2030 and at least one fully net zero cluster by 2040.*
- *Investing £1 billion up to 2025 to facilitate the deployment of CCUS in two industrial clusters by the mid-2020s, and a further two clusters by 2030, supporting our ambition to capture 10 Mt per year by the end of the decade.*
- *Working with industry, aiming to develop 5GW of low-carbon hydrogen production capacity by 2030."* [our underlining]

5.4.13 Chapter 2 *'Power'* of the EWP set out how it is proposed to decarbonise the power sector the generation of electricity. This includes a commitment to consult on steps to ensure that new thermal plants can convert to low carbon technologies either through the retrofit of carbon capture plant or "…*conversion to firing clean hydrogen*" (page 48).

5.4.14 Chapter 5 *'Industrial Energy'* sets out the goal for emissions from industry to fall by around 90% from today's levels by 2050. To achieve this (page 118) the Government:

"…will:

- *Create a sustainable future for UK manufacturing industry through improved energy efficiency and the adoption of clean energy technologies*
- *Establish the UK as a world leader in the deployment of CCUS and clean hydrogen, supporting up to 60,000 jobs by 2030."* [our underlining]

5.4.15 The EWP confirms that manufacturing and refineries, which form the bulk of industrial emissions, still account for around 1% of the UK's GHG emissions. About half of those emissions are concentrated in the UK's six major industrial clusters. This includes Teesside (Figure 8.1, page 121) which accounts for 3.9 Mt CO_{2e} of emissions (2018 figures).

5.4.16 To transform industrial energy, the EWP (page 122) states that we cannot rely on energy efficiency alone to reduce emission in line with the Government's 2050 goal. Manufacturing industry will also need to capture its carbon for onward transport and storage and switch from using fossil fuels to low-carbon alternatives, such as H_2.

5.4.17 To bring about change in the industrial, the EWP includes a commitment (page 124) to increase the *'Industrial Clusters Mission'* to support the delivery of four low-carbon industrial clusters by 2030 and at least one fully net zero cluster by 2040. The EWP states that the Government will focus on the UK's industrial clusters:

"… centres where related industries have congregated and can benefit from utilising shared clean energy infrastructure, such as CCUS and low-carbon hydrogen production and distribution. Decarbonisation in clusters will enable economies of scale, reducing the unit cost for each tonne of carbon abated, while clusters provide high quality jobs which tend to pay above the UK average wage." [our underlining]

5.4.18 The EWP notes (page 124) that many clusters are in regions in need of economic revitalisation and that decarbonising those clusters can act as a driver of prosperity for the surrounding areas. Furthermore, that investments in key technologies like CCUS and H_2, will be crucial to enhancing local economic growth and creating jobs together with prosperity.

5.4.19 Chapter 5 of the EWP includes a section on 'Clean Hydrogen' (pages 127 to 128). It identifies that H_2 will be critical in reducing emissions from heavy industry, as well as in power, heat and transport. Clean H_2 includes using natural gas and capturing the CO_2 by-product with CCUS or using renewable electricity to split water into H_2 and O_2. It includes commitments to:

- work with industry to develop 5 GW of low-carbon H_2 production capacity by 2030; and
- create a Net Zero Hydrogen Fund to support low-carbon H_2 production, providing £240 million of capital co-investment out to 2024/25.

5.4.20 The EWP underlines (page 128) that a variety of H_2 production technologies will be required to satisfy the level of anticipated demand for clean H_2 by 2050 and that the Government hopes to see 1GW of H_2 production capacity by 2025 on route to its 2030 goal.

5.4.21 The Proposed Development is clearly consistent with commitments in the EWP to deliver low carbon H_2 production at scale, coupled with CCUS, within one (Teesside) of the UK's major industrial clusters.

Industrial Decarbonisation Strategy (March 2021)

5.4.22 The Industrial Decarbonisation Strategy is the first strategy published by a major economy, which sets out how industry can be decarbonised in line with net zero, while remaining competitive and without pushing emissions abroad. It builds on the Ten Point Plan and sets out the Government's vision for a prosperous, low carbon UK industrial sector by 2050, and aims to provide industry with the long-term certainty it needs to invest in decarbonisation.

5.4.23 The Ministerial Foreword (page 6) emphasises that the 2020s will be crucial to industrial decarbonisation, with the UK needing to deploy key technologies such as CCUS while beginning the journey of switching from fossil fuel combustion to low carbon alternatives such as H_2.

5.4.24 Chapter 1 *'Why we need a strategy and our approach'* sets out the Government's ambition for decarbonising industry in line with net zero. The expectation is that emissions will need to reduce by at least two-thirds by 2035 and by at least 90% by

2050, with 3 Mt CO_2 per annum captured through CCUS and a significant switching to low carbon fuels such as H_2 by 2030. Significantly, the Strategy (page 18) recognises that government should play a key role in the delivery of large infrastructure projects for key technologies such as H_2 networks where there is a sharing of benefits, and the risk or cost is too great for the private sector.

5.4.25 Chapter 2 *'Getting investors to choose low carbon'* confirms the Government's commitment (Action 2.2) to put in place funding mechanisms to support the deployment and use of CCUS and low carbon H_2 infrastructure. It states that (pages 29-30):

"CCUS will be crucial to reaching net zero, and low carbon hydrogen has the potential to play a key role in enabling the economic transformation of the UK's industrial regions. With both technologies at early stages of development, government will need to play an active role in overcoming market failures; sharing the risk and costs of scaling up deployment of both CCUS and low carbon hydrogen.

…. We have already committed to a £1 billion CCS Infrastructure Fund to provide industry with certainty to deploy CCUS at pace and scale, alongside a £240 million Net Zero Hydrogen Fund. Later in 2021 will bring forward further details of the revenue mechanism to support business models for both industrial carbon capture and low carbon hydrogen projects." [our underlining]

5.4.26 With regard to fuel switching (Action 4.2, pages 51 and 52), Chapter 4 of the Strategy confirms that the Government is committed to developing a low carbon H_2 economy in the UK. The Government sees it as critical to demonstrate fuel switching to H_2 in industrial sites in parallel to ramping up low carbon H_2 production.

5.4.27 The Proposed Development will make a significant contribution to industrial decarbonisation in the UK through the production of and supply of low carbon H_2 to a number of industrial users/offtakers on Teesside.

North Sea Transition Deal (March 2021)

5.4.28 The North Sea Deal is a transformational sector deal for the offshore oil and gas sector in recognition of the key role that it can play in helping the UK meet its net zero commitments. The document recognises (Foreword, page 6) that with declining output of hydrocarbons from the UK Continental Shelf ('UKCS') and a projected decline in domestic demand, there is a clear need for determined action to be taken to build on the proven capabilities and skills within the existing sector to support the transition to net zero. It continues:

"The UK already has the capability and skills within the existing sector to lead in new and emerging energy technologies such as Carbon Capture, Usage and Storage (CCUS) and the hydrogen economy as well as to support the growth of new sectors such as offshore wind.

… Delivering large-scale decarbonisation solutions will strengthen the position of the existing UK energy sector supply chain in a net zero world, securing new high-value jobs in the UK, supporting the development of regional economies and competing in clean energy export markets." [our underlining]

5.4.29 The Executive Summary (page 8) states that the North Sea Deal is aimed at delivering on the commitments set out in the oil and gas chapter of the EWP and is closely aligned with the Prime Minister's Ten Point Plan. It seeks to do this through the implementation of several commitments and measures, including supporting up to 40,000 direct and indirect supply chain jobs in decarbonising UKCS production and the CCUS and H_2 sectors.

5.4.30 The Deal is built on five key outcomes – supply decarbonisation; CCUS; H_2; supply chain transformation; and people and skills. These are seen as being closely interlinked, meaning that they must be delivered as an integrated whole for the Deal to achieve its full potential. With regard to H_2, the Deal notes that:

"Hydrogen is essential to meeting our net zero commitment in the UK. It could provide a clean source of energy across the economy, from industrial and domestic heat, to heavy transport, and flexible power and energy storage. The UK already has world-leading offshore wind potential and electrolyser capability, alongside unparalleled CCS sites that the UK can maximise to scale up low carbon hydrogen production.

The hydrogen commitment in the North Sea Transition Deal focuses on creating the economic environment in which low carbon hydrogen production can flourish. This will help unlock billions of pounds of investment from the sector. The oil and gas sector is positioned to enable the production of low-carbon hydrogen at scale as part of a long-term competitive market, supporting the UK's ambition to deliver 5 GW of low carbon hydrogen production capacity by 2030."

5.4.31 The Proposed Development is well placed to support the commitments set out in the North Seas Transition Deal, being able to link into NZT (part of the East Coast Cluster), which will make use of offshore skills, capabilities and resources.

<u>UK Hydrogen Strategy (August 2021)</u>

5.4.32 The UK Hydrogen Strategy sets out the Government's approach to developing a thriving low carbon H_2 sector in the UK to meet its ambition for up to 5 GW of low carbon H_2 production capacity by 2030.

5.4.33 Chapter 1 *'The case for low carbon hydrogen'* confirms that low carbon H_2 will be critical for meeting the UK's legally binding commitment to achieve net zero by 2050 and Carbon Budget Six in the mid-2030s. H_2 can support the deep decarbonisation of the UK economy, particularly in the "hard to electrify" UK industrial sectors, and can provide greener, flexible energy across power, heat and transport (page 7). It goes onto state (page 8):

"Today most hydrogen produced and used in the UK and globally is high carbon, coming from fossil fuels with no carbon capture; only a small fraction can be called low carbon. For hydrogen to play a part in our journey to net zero, all current and future production will need to be low carbon."

5.4.34 Section 1.3 of Chapter 1 *'The UK's hydrogen opportunity'* sets out the Government's *'twin track'* approach to H_2 production, which seeks to capitalise on the UK's potential to produce large quantities of both electrolytic 'green' and CCUS enabled 'blue' hydrogen. It states that the UK has the technology, know-how and storage potential to scale up CCUS across the country, unlocking new routes to CCUS-enabled H_2 production (page 10). It goes onto state (Page 10):

"Early deployment of CCUS technology and infrastructure will likely be located in industrial clusters. Many of these are in coastal locations, with important links to CO_2 storage sites such as disused oil and gas fields. Government aims to establish CCUS in four industrial clusters by 2030 at the latest, supporting our ambition to capture 10 Mt/ CO_2 per annum.

In turn, industrial clusters and wider industry are significant potential demand centres for low carbon hydrogen. Today, numerous industrial sectors from chemicals to food and drink are exploring the role that hydrogen can play in their journey to net zero. UK Research and Innovation's (UKRI's) Industrial Decarbonisation Challenge provides up to £170 million – matched by £261 million from industry – to invest in developing industrial decarbonisation infrastructure including CCUS and low carbon hydrogen." [our underlining]

5.4.35 Figure 1.3 at Chapter 1 of the Strategy identifies Teesside as a location for both green and blue (CCUS-enabled) H_2 production (page 11).

5.4.36 The Strategy (page 33) highlights to potential of CCUS-enabled blue H_2 production, stating:

"Our Hydrogen Production Cost 2021 report suggests that, under central fuel price assumptions, CCUS-enabled methane reformation is currently the lowest cost low carbon hydrogen production technology. Given the potential production capacity of CCUS-enabled hydrogen plants, we would expect this route to be able to deliver a greater scale of hydrogen production as we look to establish a UK hydrogen economy during the 2020s."

5.4.37 The Strategy considers the *'Use of hydrogen in industry'* (pages 52 and 53) stating:

"It is clear that UK industrial sectors will play a vital role in developing a hydrogen economy over the next decade. Industry produced 16 per cent of UK emissions in 2018, and hydrogen will be critical to decarbonise industrial processes that would be hard to abate with CCUS or electrification. The Industrial Decarbonisation Strategy published earlier this year sets out the policy and technology principles to

decarbonise industry by 2050, including the installation of deep decarbonisation infrastructure such as hydrogen and CCUS networks in the 2020s.

Our industrial heartlands will likely lead the way for large scale low carbon hydrogen supply, and industrial users are expected to provide the most significant new demand for hydrogen by 2030 through industrial fuel switching. Today's hydrogen economy will need to scale up from its current base in the oil refining and chemical sectors, to enter other parts of industry and the wider energy system. We will develop policy to support and deliver this change, and to drive the decarbonisation of existing industrial hydrogen use." [our underlining]

5.4.38 Since the UK Hydrogen Strategy was published, the British Energy Security Strategy (April 2022) has doubled the UK's H_2 production ambition from 5 GW to 10 GW by 2030. The is reflected in the latest '*Hydrogen Strategy update to the market*' issued to BEIS in December 2022. The Hydrogen Strategy update to the market also includes the announcement on shortlisted hydrogen projects in the BEIS Phase 2 Cluster Sequencing Process (Cluster sequencing Phase-2: shortlisted projects (power CCUS, hydrogen and ICC), August 2022)), which identifies H2Teesside as one of the shortlisted projects to have moved to the due diligence stage of the process.

Net Zero Strategy: Build Back Greener (October 2021)

5.4.39 The '*Net Zero Strategy: Build Back Greener*' expands on key commitments in the Ten Point Plan and the EWP and sets out the next steps the Government proposes to take to cut emissions, seize green economic opportunities and leverage further private investment into net zero. The Strategy sets an indicative delivery pathway for emissions reductions to 2037 by sector. It is intended to put the UK on the path for Carbon Budget 6 and ultimately on course for net zero by 2050.

5.4.40 Regarding power, the Strategy states that the UK will fully decarbonise its power system by 2035 subject to security of supply. It states that the power system will consist of abundant, cheap renewables, cutting edge new nuclear power stations, underpinned by flexibility including storage, gas with CCUS and H_2 (page 19).

5.4.41 For industry, the Net Strategy states (page 21) that it will deliver four CCUS clusters, capturing 20-30 Mt CO_2 across the economy, including 6 Mt CO_2 of industrial emissions, per year by 2030. This will be done by supporting industry to switch to cleaner fuels, such as low carbon H_2 alongside renewable energy and CCUS. These clusters, including the East Coast Cluster, which includes NZT, could have the opportunity to access support under the Government's CCUS programme (£1 billion). The Strategy also states that the Government has set up the Industrial Decarbonisation and Hydrogen Revenue Support Scheme, providing up to £140 million to fund new H_2 and industrial carbon capture business models. This is in addition to £240 million Net Zero Hydrogen Fund.

5.4.42 Whilst the Net Zero Strategy was the subject of a successful Judicial Review, the Court's decision did not quash the Strategy, but instead ordered the Government to

provide an update to that strategy in March 2023 to add further explanation as to how the Government's aims set out in the Strategy would be met.

British Energy Security Strategy (April 2022)

5.4.43 The BESS was published largely in response to soaring energy prices as a result of a sudden surge in demand following the Coronavirus (COVID-19) pandemic, compounded by the Russian invasion of Ukraine. Much of the focus of the strategy is upon providing financial assistance to families and businesses struggling with higher energy bills, but it also looks at improved energy efficiency, reducing the amount of energy we need and addressing the underlying vulnerability to international oil and gas prices by reducing the UK's dependence on imported oil and gas.

5.4.44 Notably, the BESS identifies the importance of low carbon H_2, with an increased commitment to achieve up to 10 GW of H_2 production by 2030, including CCUS-enabled blue H_2.

5.5 National Planning Policy Framework

5.5.1 The NPPF (MHCLG, 2021), introduced in March 2012 (last updated July 2021), sets out the Government's planning policies for England. It is a material consideration in planning decisions. Although paragraph 5 of the NPPF confirms that NSIPs are to be determined in accordance with the decision-making framework of the PA 2008 and relevant NPSs, decisions on NSIPs should also take account of any other matters that are "*relevant*", which may include the NPPF. The NPPF is supported by the Planning Practice Guidance (PPG), which provides more detailed guidance on various aspects of planning.

5.5.2 Section 2 *'Achieving sustainable development'* confirms (paragraph 7) that the purpose of the planning system is to contribute to the achievement of sustainable development, summarised as "*meeting the needs of the present without compromising the ability of future generations to meet their own needs*". Paragraph 8 goes on to identify three overarching objectives to the achievement of sustainable development, which are interdependent and need to be pursued in mutually supportive ways. These are:

- an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
- a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and

- an environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

5.5.3 Central to the NPPF is "*the presumption in favour of sustainable development*". This is set out at Paragraph 11. For decision-making, this means approving applications that accord with the development plan without delay.

5.5.4 The NPPF is supportive of infrastructure projects. One of the methods of fulfilling the objective of sustainable development listed at paragraph 8 under 'a) an economic objective' is through the "*provision of infrastructure*".

5.5.5 Paragraph 152 in Section 14 *'Meeting the challenge of climate change, flooding and coastal change'* states:

"The planning system should support the transition to a low carbon future in a changing climate … it should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure". [underlining added]

5.5.6 Paragraph 158 states that when determining application for renewable and low carbon development, there should be no requirement for applicants to demonstrate the overall need for renewable or low carbon energy and that applications for renewable or low carbon development should be approved if their impacts are (or can be made) acceptable.

5.5.7 NPPF policies of particular relevance include:

- building a strong, competitive economy;
- making effective use of land;
- meeting the challenge of climate change, flooding and coastal change; and
- conserving and enhancing the natural environment.

5.5.8 A summary of those policies is provided in Table 5-1 below.

Table 5-1: Relevant National Planning Policy Framework Policies

POLICY	POLICY SUMMARY
Chapter 6 – Building a strong, competitive economy	Confirms that the Government is committed to securing economic growth and productivity and allowing each area to build on its strengths, counter any weaknesses and address the challenges of the future. Paragraphs 81 and 82 make it clear that the planning system should do all it can to support sustainable economic growth though, amongst other measures, planning

POLICY	POLICY SUMMARY
	proactively and removing barriers to investment such as a lack of infrastructure.
Chapter 11 – Making effective use of land	Aimed at promoting the effective use of land, including by (paragraph 120c) giving substantial weight to the use of suitable brownfield land.
Chapter 14 – Meeting the challenge of climate change, flooding and coastal change	Focuses upon adapting to and mitigating the effects of climate change. Paragraph 152 highlights that planning plays a key role in helping shape places to secure radical reductions in GHG emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy. Paragraph 159 warns that inappropriate development in areas at risk of flooding should be avoided but where it is necessary the development should be made safe for its lifetime without increasing flood risk elsewhere. If it is not possible for development to be in zones with a lower risk of flooding the exception test may have to be applied.
Chapter 15 – Conserving and enhancing the natural environment	Aimed at protecting and enhancing value landscapes, recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital, minimising impacts on and providing net gains for biodiversity and preventing new and existing development from contributing to, being put at unacceptable risk from or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.

5.5.9 The above NPPF policies will be considered in detail within the Planning Statement.

5.5.10 The Government has launched a consultation on proposed reforms to National Planning Policy. A revised NPPF is expected to be published in Spring 2023. The Planning Statement will consider any policy changes within the revised NPPF of relevance to the Proposed Development.

5.6 Local Planning Policy

Development Plan Documents

5.6.1 Both Main Site (A and B) are located within the administrative boundary of RCBC.

5.6.2 The hydrogen pipelines and other connections involve crossings of the River Tees and encompass land within the administrative boundaries of RCBC, STBC and HBC.

5.6.3 The relevant Development Plan Documents (DPDs) for the Proposed Development Site are therefore as follows:

- the Redcar & Cleveland Local Plan and Policies Map (adopted May 2018; RCBC, 2018a);
- Stockton-on-Tees Borough Council Local Plan (adopted January 2019; STBC, 2019);

- Hartlepool Local Plan (adopted May 2018; HBC, 2018); and
- The Tees Valley Joint Minerals and Waste DPDs (adopted September 2011; Darlington Borough Council *et al*., 2011).

5.6.4 The Tees Valley Joint Minerals and Waste DPDs comprise a Minerals and Waste Core Strategy DPD and a Minerals and Waste Policies and Sites DPD. The Joint Minerals and Waste DPDs were prepared together by RCBC, STBC, HBC and Darlington and Middlesbrough Councils. The Joint Minerals and Waste DPD is of limited relevance to the Proposed Development.

Supplementary Planning Documents

5.6.5 Parts of the Proposed Development Site lie within the boundary of the South Tees Development Corporation (STDC) area, which is now known as Teesworks. STDC is a Mayoral Development Corporation, established to further the economic development of the South Tees Area through physical, social and environmental regeneration, however, RCBC retains planning powers for the area and continues to act as the LPA in respect of planning policy and development management and the processing and determination of planning applications.

5.6.6 STDC has produced a Master Plan (the 'South Tees Regeneration Master Plan') to provide a flexible framework for the regeneration of the Teesworks/South Tees Area. The Master Plan was prepared throughout 2017 (later revised in 2019 as STDC (2019)) as a supporting visioning and development strategy document to inform the preparation of a Supplementary Planning Document (SPD) by RCBC for the South Tees Area. Following consultation, the Master Plan was launched alongside the South Tees Area SPD, which was formally adopted by RCBC in May 2018 (RCBC, 2018b).

Planning Allocations/ Designations

5.6.7 The key planning allocations/designation and related development plan policies (based upon the relevant policies maps) and relevant SPD designations and policies that apply to the Proposed Development Site within the administrative areas of RCBC, STBC and HBC are listed below.

5.6.8 The key planning allocations/designations and related development plan policies that apply to the Proposed development Site within the RCBC area are:

- Development Limits – Policy SD3;
- Protected Employment Area – Policy ED6;
- South Tees Development Corporation Area – Policy LS4;
- 30 km wind farm safeguarding area for Durham Tees Valley Airport – Policy SD6;
- Sensitive Landscape Areas – Policy N1;
- Restoration Landscape Areas – Policy N1;
- Strategic Landscape Areas – Policy N2;
- Special Protection Areas (SPAs) – Policy N4;

- Sites of Special Scientific Interest (SSSIs) – Policy N4;
- 6 km SPA Buffer Zone – Policy N4;
- Local Wildlife Sites – Policy N4;
- Marine Dredged Sand and Gravel – Policies MWC4 and MWC5;
- General Location for Large Waste Management Facilities – Policy MWC8;
- South Tees Eco Park – Policies MWP8 and MWP10(b); and
- Safeguarded Wharves – Policy MWC11.

5.6.9 Figure 2 of the South Tees SPD shows indicative clusters for key industries and processes within the South Tees Area. Main Sites A and Main Site B are identified as clusters for manufacturing, manufacturing and energy, while within their vicinity clusters are shown for port-related uses, bulks and other processing, advanced manufacturing and training, testing and research.

5.6.10 The SPD divides the South Tees Area into five main development zones (as shown by Figure 6 of the SPD). These are the North Industrial Zone; North East Industrial Zone; Central Industrial Zone; South Industrial Zone; and Coastal Community Zone. The North Industrial Zone, which encompasses the Main Sites A and B, is identified for development proposals relating to port related industry, major space users/large scale manufacturing, energy innovation, power generation and storage, bulk materials and mineral processing.

5.6.11 The SPD sets out several '*Development Principles*' to guide the development of the Teesworks/South Tees Area. Those of particular relevance to the Proposed Development include:

- Development Principle STDC6: Energy Innovation;
- Development Principle STCD7: Natural Environmental Protection and Enhancement;
- Development Principle STDC10: Utilities; and
- Development Principle STDC11: North Industrial Zone.

5.6.12 Development Principle STDC6 *'Energy Innovation'* (pages 33 to 34) supports new energy generation within the area, including the promotion of renewable energy and innovative energy projects. STDC11 *'North Industrial Zone'* states that STDC will encourage development proposals relating to port related industry, major space users/large scale manufacturing, energy innovation, power generation and storage and bulk materials and processing within this area.

5.6.13 Key planning allocations/designations and related development plan policies for the STBC administrative area are:

- Development Limits – Policies SD2, SD3, SD4 and SD5;
- General Employment Allocation/Locations – Policies SD4 and EG1;

- Employment Areas/Specialist Use Locations – Policies SD4 and EG4;
- Reserve Housing Land – Polices H1 and H2;
- Durham Tees Valley Airport Safeguarding Area – Policy EG5;
- Internationally Designated Sites (SPAs and Ramsar sites) – Polices SD5 and ENV5;
- Nationally Designated Sites (SSSIs) – Policies SD5 and ENV5;
- Locally Designated Sites (Local Nature Reserves) – Policies SD5 and ENV5;
- Locally Designated Sites (Local Wildlife Sites) – Policies SD5, ENV5; and
- Open Space – Policies SD5 and ENV5.

5.6.14 Key planning allocations/designations and related development plan policies for the HBC administrative area are:

- Development Limits – Policies LS1 and RUR2;
- Strategic Gaps – Policy LS1;
- Underground Storage – Policy EMP6;
- Safeguarded Land for Future Road Schemes – Policy INF2;
- Internationally Designated Sites – Policy NE1a; and
- Local Wildlife Sites – Policy NE1c.

5.6.15 The above policies and development principles, and how the Proposed Development complies with them, will be considered in detail within the Planning Statement that will form part of the application for development consent.

Summary

5.6.16 The current NPSs confirm the need that exists for new energy infrastructure and are the key basis for decision-making by the SoS on development consent applications.

5.6.17 Although the current NPSs do not contain policies that specifically relate to H_2 infrastructure, they do contain policy that is relevant to the Proposed Development, while the draft revised NPSs include new policy in relation to H_2 infrastructure, which confirms (paragraphs 3.4.11 to 3.4.15) that "*The government is committed to developing low carbon hydrogen, which will be critical for meeting the UK's legally binding commitment to achieve net zero by 2050, with the potential to help decarbonise vital UK industry sectors and provide flexible deployment across heat, power and transport*" and there is an "*urgent need for all types of low carbon hydrogen infrastructure".*

5.6.18 While the NPSs are the key basis for decisions by the SoS on development consent applications, the SoS can take account of any other matters that are both important and relevant to their decision. It is considered that such matters include recent Government energy and climate policy.

5.6.19 The energy and climate change policy considered in this chapter underlines the important role that H_2, coupled with CCUS, has to play in achieving the UK's transition to a low carbon economy and the Government's legally binding target of net zero GHG emissions by 2050. In particular, H_2 is identified as being critical to the decarbonisation of industries that are hard to electrify.

5.6.20 The Proposed Development is well placed to support large-scale industrial decarbonisation, being in one of the UK's major industrial clusters, with the potential to supply H_2 to a number of industrial users/offtakers, while linking into the NEP infrastructure for the transportation and storage of the CO_2 generated during the H_2 production process.

5.6.21 Other important and relevant matters can include the NPPF and local planning policy.

5.6.22 The application for development consent will include a Planning Statement that will set out in more detail the policy of relevance to the Proposed Development and include an assessment of how it complies with that policy.

6.0 POTENTIALLY SIGNIFICANT ENVIRONMENTAL EFFECTS

6.1 Introduction

6.1.1 The following sections present a discussion of the potential environmental effects associated with the Proposed Development and the topics proposed to be included as part of the EIA.

6.1.2 Each topic section has outlined the baseline conditions as well as the scope of assessment proposed based on the information currently available for the Proposed Development. The baseline sections are not intended to include a full baseline review at this stage but a summary of the main points. Some sections will be more detailed than others at this stage. However, a detailed baseline data review will be carried out for all topics as the EIA progresses and will be included within the PEI Report and subsequent ES.

6.1.3 Effects during construction, operation and decommissioning will be assessed. As identified at Section 3.18, it is often the case that sufficient information is not available at the time of assessment to inform an assessment of decommissioning impacts. However, it is generally assumed that the environmental effects associated with the decommissioning phase would be no worse than those experienced during construction and these will be assessed on this basis.

6.1.4 Please note that the baseline and scope of assessment sub-sections below are applicable to both Main Sites and the associated connection corridors unless clearly stated otherwise.

6.2 Air Quality

Baseline Conditions

6.2.1 The Environment Act 1995 requires local authorities to review air quality within their district or borough to determine where pollutant levels identified in the Air Quality Framework Directive may be in excess of the standards.

6.2.2 If pollutant levels in an area are likely to exceed statutory objectives, then local authorities must declare an Air Quality Management Area (AQMA) and draft an Air Quality Action Plan (AQAP) to achieve the statutory objectives. The Department of Environment, Food and Rural Affairs (Defra) has issued technical guidance to local authorities to assist in undertaking this task.

6.2.3 The most recent publication within the above framework is the '2022 Air Quality Annual Status Report' (RCBC, 2022).

6.2.4 There are no AQMAs designated within the administrative boundary of RCBC or the adjoining local authority areas of HBC and STBC. The nearest AQMA is located over 20 km away from the Proposed Development Site and will be outside of the Study Area for Air Quality. As outlined in '2022 Air Quality Annual Status Report' (RCBC, 2022), the Proposed Development Site is not within a smoke control area.

6.2.5 RCBC conducts local air quality monitoring for NO_2, PM_{10} and $PM_{2.5}$ (RCBC, 2022). At all locations where air quality monitoring is conducted, all pollutant concentrations are well below the relevant objectives.

6.2.6 In addition to these monitoring sites, AECOM has undertaken a three-month project specific diffusion tube monitoring survey for baseline NO_2 to establish existing concentrations within the area and adjacent to the road network surrounding the Proposed Development Site. Following completion of the survey, the results were annualised to correct for seasonal variation and make them representative of the whole year.

6.2.7 The AECOM survey recorded NO_2 concentrations which exceeded the NO_2 annual mean objective at two measurement sites (DT2 and DT6); DT2 is located approximately 1.4 km and 2.3 km south-east of Main Sites A and B respectively, and DT6 is located approximately 3.5 km and 4 km south-east of Main Sites A and B respectively. However, the locations with elevated NO_2 concentrations were situated in close proximity to major traffic routes, away from residential areas. These measurement sites are locations where people are not regularly present over the length of time represented by the annual mean air quality objective value for NO_2., Therefore, it can be assumed that there is no relevant human exposure at these locations. At residential areas near to these sites and elsewhere, where humans would be expected to be regularly present, the survey has recorded annual mean concentrations which are well within the annual mean NO_2 objective.

6.2.8 In addition to the three-month baseline survey carried out in 2021, a further three-month survey is programmed to be carried out during 2023. The purpose of the second survey is to obtain more data at locations where the original survey dataset was incomplete due to missing tubes, in addition to obtaining a longer period of monitoring throughout the study area. The update will focus on the same locations surveyed in the initial measurement period. However, a review of the monitoring sites will be conducted prior to deployment, to consider the measurement locations in the context of the latest proposed development plans.

6.2.9 If not appropriately controlled, emissions from the operation of the Proposed Development could potentially affect the health of the residents of residential areas in closest proximity to the Proposed Development Site. Emissions from road traffic could also affect human health at residential properties adjacent to traffic routes used by vehicles accessing the Proposed Development Site. Long-term impacts on ambient pollutant concentrations and the deposition of nutrient nitrogen and acid to ground could adversely affect sensitive ecosystems.

6.2.10 There are no substantive differences in the baseline conditions between Main Site A and Main Site B, therefore the baseline conditions as outlined above apply and are relevant to both. The baseline data will be used in the air quality assessment of both human health and ecological receptors.

Scope of the Assessment

6.2.11 There are a number of potential emissions to air that may be associated with the Proposed Development. These emission sources are summarised in the following sections.

Construction and Operational Emissions from Vehicles

6.2.12 During the construction and operational phases of the Proposed Development, there is the potential for changes in traffic flows on the surrounding road network due to additional vehicles accessing the Proposed Development Site. This additional traffic could give rise to an effect on local air quality in the vicinity of nearby air quality sensitive receptors, which are currently within the air quality objective values.

6.2.13 The assessment of road traffic emissions will be based on criteria set out in guidance published by the Institute for Air Quality Management (IAQM) (2017) or National Highways (LA105, 2022), on the requirement to undertake a detailed assessment of road traffic emissions.

6.2.14 As operational amounts of daily traffic are predicted to be well-below these screening criteria of 500 Light Duty Vehicles or 100 Heavy Duty Vehicles per day, as set out in the IAQM guidance document Land-Use Planning & Development Control Guidance (IAQM, 2017), the operational impacts of traffic have been scoped out of this assessment.

6.2.15 As outlined in Section 6.9: Traffic and Transportation, a construction traffic assessment shall be conducted. After this has been completed, this data will be screened against the relevant criteria to scope the need for detailed modelling in or out of the assessment. Where the need for a detailed assessment is considered necessary, concentrations of NO_2 and particulate matter (PM_{10} and $PM_{2.5}$) at sensitive receptors due to changes traffic flows on the surrounding road network will be predicted using the ADMS Roads dispersion modelling software package. Data collected during the project-specific baseline NO_2 survey will be used to verify the performance of the model against measured values.

Construction Dust and Mobile Plant

6.2.16 Construction phase dust impacts, and the level of recommended mitigation will be qualitatively assessed based on the framework approach outlined in the IAQM guidance for construction dust (IAQM, 2016). The aim of such an assessment is to identify the recommended level of best practice mitigation required for the construction activities (including in design, dust monitoring and management of the Proposed Development Site) such that residual impacts are considered to be insignificant, using a risk-based approach. This risk-based approach will identify the unmitigated risk of dust impacts at human health and amenity receptors within 350m of the Proposed Development Site and ecological receptors within 50m of the Proposed Development Site. Dust associated with construction vehicles on the road network will also be considered for receptors within 50 m of roads, up to 500 m from the Proposed Development Site.

6.2.17 In addition to construction dust, the use of Non-Road Mobile Machinery (NRMM), such as mechanical excavators and earthmovers or mobile machinery, and generators, also have the potential to increase NO_2 and PM_{10} concentrations locally,

when in use within the construction site boundary. According to IAQM guidance (IAQM, 2014), experience of assessing the exhaust emissions from on-site plant (NRMM) and onsite traffic suggests that they are unlikely to have a significant effect on local air quality, due to the intermittent nature of their use within the confinement of the Proposed Development Site. Therefore, in most cases, they do not need to be quantitatively assessed. In this case, given the distance between the Main Sites and the nearest residential property (Marsh House Farm/Marsh Farmhouse, located approximately 1.3km and 2.2km to the east of Main Sites A and B respectively), emissions from on-site plant during construction are unlikely to generate a significant risk of effects on local air quality for either human health or ecological receptors.

6.2.18 Emissions from NRMM associated with the Proposed Development would be temporary and localised and would be controlled via the application of appropriate emissions standards and through best-practice mitigation measures, as listed within the CEMP for the Proposed Development. For that reason, construction phase NRMM emissions are highly unlikely to be significant and, have been scoped out of this assessment.

Operational Emissions from the Production Facility

6.2.19 Potential emission points to air from the Proposed Development once it is operational include:

- the direct fired heater;
- venting from the process condensate drum, via the flare stack during normal operation;
- disposal of process material via the flare stack during an emergency event;
- auxiliary boiler;
- emergency diesel generators; and
- an emergency CO_2 vent.

6.2.20 The main pollutants that could be released from these emission sources would be Nitrogen Oxides (NO_x), Sulphur Oxides (SO_x), CO, particulates and NH_3.

6.2.21 Of the sources listed above, the natural gas fuelled direct fired heater, the auxiliary boiler and the condensate flare drum vent would be assumed at this stage to operate on a continuous basis.

6.2.22 The operation of the flare and diesel generators would only take place during an emergency situation and or abnormal circumstances and during testing.

6.2.23 In addition to the emission sources listed above, there would be some emissions to air from fugitive sources. These releases would be small scale and readily diluted and would consist only of water vapour, N_2, O_2, H_2, CH_4 and CO_2 and will not require consideration within the EIA as they will be insignificant.

6.2.24 The impact of operational process emissions will be considered quantitatively using the ADMS dispersion modelling software package, at both human health and sensitive ecological receptor locations. The impact of emission sources that are continuously operational will be assessed at both national and international designated ecological receptors within up to 15 km of the Proposed Development Site.

6.2.25 It is considered that the operation of the hydrogen pipeline, natural gas connection, electrical connection and water connections would be unlikely to result in significant effects in terms of emissions to air and, therefore an assessment of operational impacts of these parts of the Proposed Development has been scoped out of the assessment.

6.2.26 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.3 Surface Water, Flood Risk and Water Resources

Baseline Conditions

Topography, Land-Use and Climate

6.3.1 Both Main Site A and Main Site B are characterised by the flat, low-lying coastal topography. Main Site A has typical ground levels of approximately 6-8 m AOD. Main Site B has typical ground levels of approximately 2-7m AOD. Ground levels for the majority of Main Site B are approximately 5-7m AOD; the north-western corner of Main Site B is lower at approximately 2 m AOD.

6.3.2 The land use of the surrounding areas to the south and west of the Proposed Development Site is predominantly industrial, around the River Tees. The average rainfall varies throughout the year, with the wettest period being in the late summer to autumn, and driest in late winter to early spring. Average monthly rainfall is generally less than 60 mm throughout the year, except in August and November when it is between 60 mm and 65 mm. February is the driest month with an average of approximately 33 mm between 1981 and 2010.

Surface Waterbodies and Features

6.3.3 Water Framework Directive (WFD) waterbodies close to the Proposed Development Site include the Tees Estuary, Tees Coastal, Tees Estuary (South Bank) (fluvial) waterbodies and the Sherwood Sandstone, Tees Mercia Mudstone and Redcar Mudstone groundwater bodies.

6.3.4 Each of the surface waterbodies is classified as being of Moderate ecological status (Environment Agency, 2019), with a fail in chemical status due to elevated levels of various priority substances. Tees Mercia Mudstone and Redcar Mudstone groundwater body had an overall classification of ‘Poor’ in 2019, due to a poor chemical-dependent surface waterbody status.

6.3.5 North-east of the Proposed Development Site, Coatham Sands is a designated bathing water (as ‘Redcar Coatham’). The Environment Agency’s Bathing Water Quality website notes that the Redcar Coatham bathing water is subject to short

term pollution caused when heavy rainfall or high tides wash faecal material to the sea from livestock, sewage and urban drainage via rivers and streams. The southern extent of the Seaton Carew North Gare Bathing Water is within 2 km of the Proposed Development Site and has a classification of Excellent for 2019.

6.3.6 In addition to the Tees Coastal waterbody and the Tees Transitional waterbody, the Proposed Development interacts with seven watercourses within the Tees Lower and Estuary Operational WFD Catchment, the baseline information on each water feature is provided in Table 6-1. Within Coatham Sands there is also a small, isolated, artificial pond. Water Constraints with 5 km of the Proposed Development Site are illustrated on Figure 11 (Appendix A). More detailed figures will be presented to illustrate all relevant water receptors at the PEI and ES stages.

Table 6-1: Water Features Which Interact with the Proposed Development

WATER FEATURE	BASELINE DESCRIPTION
Tees Coastal Water (GB650301500005)	The Tees Coastal water body stretches from approximately 20 km south-east of Redcar at Boulby, to approximately 13 km north-west of Redcar at Crimdon. It includes a total area of 88.31km^2. The Tees Coastal Water WFD waterbody is of 'Moderate' ecological potential, it's chemical status is 'Fail', and it's hydromorphological designation is 'heavily modified'.
Tees Transitional Water Body/ Seaton on Tees Channel Delta (GB510302509900)	The Tees Transitional water body extends from the Tees Barrage to the east of Stockton-on-Tees, to Teesmouth for a distance of approximately 16 km. It includes a total area of 11.44 km^2. The designation includes the mud and sand flats at Seal Sands, Tees Dock, Greatham Creek and Dabholm Gut. Greatham Creek is the estuarine section of Greatham Beck, which flows from the north of Elwick (National Grid Reference (NGR) NZ 45077 33468) to Seal Sands (NGR NZ 51667 25568) and into the Seaton on Tees Channel. The Tees Transitional WFD Waterbody is of 'Moderate' ecological potential, it's chemical status is 'Fail', and it's hydromorphological designation is 'heavily modified'.
Greatham Creek	The watercourse displays minimal historic change in planform since the early 1900s however the presence of meanders demonstrate some lateral movement historically. The Creek is formed in tidal flat deposits of sand, silt, and clay but some outer edges of meanders are encroaching upon till deposits. The upstream sections are constrained between arable land and a waste-management site with extensive management indicated by the presence of a floodplain embankment which disconnects Greatham Creek from much of the floodplain.
The Fleet/ Tees Estuary (South Bank) (GB1030250723320)	This watercourse is known on local mapping as The Fleet and is designated from adjacent to Longbeck Lane in Saltburn (NGR NZ 60988 20908). It continues north to the west of Redcar, and then flows west through the industrial works to discharge into Dabholm Gut at NGR NZ 56131 24038. The Tees Estuary (S Bank) WFD waterbody is of 'Moderate' ecological potential, it's

WATER FEATURE	BASELINE DESCRIPTION
	chemical status is 'Fail', and it's hydromorphological designation is 'heavily modified'.
The Mill Race	The course of the Mill Race is unclear as it is largely culverted but appears to emanate from a coalescence of ditches and watercourses at NGR NZ 57893 22824, then flows north of the Wilton International Site beneath the A1085. It remerges at NGR NZ 57102 24152 and flows west into The Fleet. In this section the watercourse appears to be approximately 4 m wide flowing to a culvert, with artificial concrete banks in places. Banks are step and incised. There are numerous service crossings of the watercourse at this location.
Dabholm Beck/ Gut	The Dabholm Gut is an artificial channel of around 1 km length left following historical land reclamation. Upstream is Dabholm Beck which is formed from the coalescence of numerous small watercourses and drains through an area of freshwater marshland to the north-west of the Wilton International Site (upstream of the tidal limit). At the tidal limit where it becomes Dabholm Gut, the channel widens to approximately 30 m and numerous outfalls are present. The channel width remains constant up to the confluence with the Tees. Northumbrian Water's Bran Sands WwTW discharges into the Dabholm Gut.
Mains Dike	Mains Dike watercourse rises from a spring in Wilton Wood at NGR NZ 59328 19741. The watercourse then flows north along the eastern boundary of the Wilton International Site, and into the Mill Race at NGR NZ 57893 22824. Main's Dike is characterised by being very straight, around 1 m in width and with steep incised banks rising around 4 m from the channel. There is evidence of some lateral erosion of the banks and the formation of small, alternating fine gravel lateral bars.
Kettle Beck	Kettle Beck rises at Lazenby Bank and flows approximately 4 km generally north along the edge of the Wilton International Site, beneath the A1085, beneath the Teesside Works (Lackenby), and beyond the A1053 before discharging to the Tees. The exact course of the watercourse is no clear from online mapping north of the A1085 as the watercourse is culverted.
Kinkerdale Beck	This watercourse is mapped as a surface waterbody for 320 m at the north-western extent of the Wilton International Site (NZ 56071 20996) and is then in culvert. As such, the source and exact course of the watercourse is not known, although it is known to outfall to the Lackenby Channel.
Knitting Wife Beck	This watercourse rises just north of the A66 in Grangetown (NZ 55172 20910), before flowing north for approximately 300 m towards the Lackenby Steelworks. The watercourse is then culverted and so the course alignment is unclear but is known to outfall at the Lackenby Channel.
Lackenby Channel	The Lackenby Channel is a drainage cut between the Lackenby steelworks (NZ 55305 22207) and the eastern bank of the Tees estuary (NZ 54145 23341). It is approximately 1.6 km in length

WATER FEATURE	BASELINE DESCRIPTION
	and conveys flows from Knitting Wife Beck, Kinkerdale Beck and Kettle Beck to the Tees.
Belasis Beck	Belasis Beck appears to rise from ponds in Belasis Hall Technology Park (NZ 47373 23267) and flows east for 2 km before its confluence with Holme Fleet within Saltholme Nature Reserve at NZ 49071 23577
Network of drains	A number of smaller watercourses/drains are present within the study area, and whilst they do not have individual WFD classifications, if they interact with the Proposed Development Site, they will be considered at further phases of the assessment through the WFD water body catchment that they fall within. Watercourses that do not have individual WFD classifications take the classification of the receiving water body. The watercourses are likely to be largely artificial in nature and would have been developed, or modified, to aid land drainage. As a result, they are likely to be relatively low energy and uniform in nature, with little floodplain connectivity. However, individually they may contribute to the provision of aquatic habitat within the area, even if it is not the unaltered habitat of the area and therefore may still need to be considered.

Water Resources

6.3.7 The location of surface water, and groundwater abstractions, details of pollution incidents, and discharge consents will be requested from the Environment Agency to inform the assessment. Details of Private Water Supply (PWS) abstractions will be requested from the local authorities (i.e. RCBC, STBC and HBC) to inform the baseline.

6.3.8 A small section of the Proposed Development Site at Haverton Hill Road (within the Hydrogen Pipeline Corridor, at its western end) is located within a NVZ. There are no Drinking Water Protected Areas or Drinking Water Safeguard Zones (Groundwater or Surface Water) located within 15 km of the Proposed Development Site. The closest SPZ is located approximately 3.7 km north-west of the Proposed Development Site.

6.3.9 The Teesmouth and Cleveland Coast SPA is a catchment where future development must be nutrient neutral.

Designated Nature Conservations Sites

6.3.10 There are a number of statutory designated sites for nature conservation within the study area. Section 6.6: Ecology and Nature Conversation provides a list of SPAs, SACs, Ramsar Sites and NNRs within 15 km of the Proposed Development Site, and SSSIs and LNRs within 5 km of the Proposed Development Site. The following sites could potentially be impacted by the Proposed Development, due to their proximity to and hydrological relationship with the Proposed Development Site:

- Seaton Dunes and Common SSSI and LNR;

- Charlton's Pond LNR;
- Cowpen Bewley Woodland Country Park LNR;
- Teesmouth NNR; and
- Teesmouth and Cleveland Coast SPA, Ramsar site and SSSI.

Flood Risk

6.3.11 Figure 11: Water Constraints with 5 km of the Proposed Development Site Boundary (Appendix A) illustrate the location of flood zones, main rivers, ordinary watercourse, and areas at risk of flooding from surface water as outlined below.

6.3.12 The River Tees (Main River) is located approximately 1 km west of the Main Site A and 75 m west of the Main Site B. The North Sea is located approximately 0.8 km to the north of the Main Site A and 1.1 km north of Main Site B. The Environment Agency (2022a) Flood Map for Planning' indicates that both Main Site A and Main Site B are located within Flood Zone 1, defined as, "*land having a less than 0.1% AEP of river or sea flooding*."

6.3.13 The utility connection corridors (depending on the route option selected) may cross the following watercourses (some, at multiple locations):

- River Tees (Main River);
- Greatham Creek (Main River);
- Seaton on Tees Channel delta/Teesmouth NNR;
- The Fleet (Ordinary Watercourse);
- The Mill Race (Ordinary Watercourse);
- Dabholm Beck/Gut (Ordinary Watercourse);
- Mains Dike (Ordinary Watercourse);
- Kettle Beck (Ordinary Watercourse);
- Kinkerdale Beck (Ordinary Watercourse);
- Belasis Beck; and
- A complex network of drains, ditches, and tributaries flowing into the larger watercourses associated with the tidal nature of this location.

6.3.14 The main risk of flooding to the Proposed Development Site is tidal/fluvial, associated with the North Sea and watercourses in and around the Proposed Development Site. The River Tees is tidal at this location, with the normal tidal limit approximately 14 km upstream (at the Tees Barrage). Significant parts of the River Tees floodplain are within Flood Zone 2 (between 0.1% and 1% AEP river flooding and between 0.1% and 0.5% AEP sea flooding) and Flood Zone 3 (greater than 1% AEP river flooding and greater than 0.5% AEP sea flooding). Some areas to the north of the Greatham Creek and in the Seal Sands and Haverton Hill area are shown to be benefitting from flood defences.

6.3.15 Whilst Main Site A, Main Site B, the CO_2 Export Corridors and the Natural Gas Connections Corridor are located entirely in Flood Zone 1, a significant amount of the Hydrogen Pipeline Corridor is located within Flood Zones 2 and 3, as illustrated on Figure 11: Water Constraints within 5 km of the Proposed Development Site Boundary (Appendix A). Small areas of the Electrical Connection Corridor and the Water Connections Corridor are also located within Flood Zones 2 and 3. Early discussions with the EA as well as interrogation of EA mapping illustrate that some of the current pipeline corridors interface with EA flood defences near Greatham Creek. This will be a consideration as the design and routeing of the hydrogen pipelines progress to ensure the integrity of these defences is not affected.

6.3.16 The Environment Agency Long Term Flood Risk map (Environment Agency 2022b), which includes Flood Risk from Surface Water (FRfSW), shows that the Main Site and Main Site B are generally at very low risk (less than 0.1% AEP). There are isolated pockets of low risk (between 0.1% and 1% AEP) throughout both Main Sites which appear to be associated with topographic low points. There are no pluvial flood flow routes crossing the Main Site A or Main Site B as per Environment Agency mapping. Environment Agency mapping shows surface water flow routes and areas of ponding associated with watercourses and bodies of water across the utility connection corridors.

6.3.17 Environment Agency mapping shows that a significant portion of the area is at risk of flooding in the unlikely event of a breach or failure of reservoirs. The reservoir flood extents largely follow the fluvial/tidal floodplains in the area. Both Main Site A and Main Site B are shown not to be affected, but the proposed pipeline corridors would cross the reservoir flood extents. Environment Agency mapping shows that the risk is associated with several reservoirs including: Hury Subsidiary, Balderhead, Blackton, Cow Green, Crookfoot, Grassholme, Selset. These are owned by Northumbrian Water with the exception of Crookfoot which is privately owned.

6.3.18 The Canal and River Trust online mapping (Canal and River Trust, 2022) does not identify any canals within the vicinity of the Proposed Development Site.

6.3.19 There are no substantive differences in the baseline conditions between Main Site A and Main Site B, therefore the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.3.20 The following potential impacts may be associated with the Proposed Development during construction (and decommissioning) and operation phases:

- Potential impacts to water conveyance where proposed pipelines cross watercourses during construction (above and below ground pipelines) and operation (for above ground pipelines).
- Encroachment within Flood Zones 2 and 3 (including potentially the functional floodplain) could lead to the displacement of fluvial/tidal floodwater during

construction and operation (above ground); subject to the preferred route of the pipeline corridors.

- Potential impact on Environment Agency flood defences where the proposed pipeline crosses/affects these areas. The impact on the defences (during construction and operation) would need to be appropriately assessed to demonstrate that they would not be compromised by the proposals.
- Potential changes to existing surface water (pluvial) flows during construction phase (for above and below ground pipelines) and operation phase (for above ground pipelines); subject to the preferred route of the pipeline corridors.
- Potential impacts on groundwater flows during construction and operation phase (for below ground pipelines). There will be no direct discharges to groundwater. However, the potential for contaminant mobilisation from the Proposed Development and the resultant impacts to groundwater will be considered with the Geology and Hydrogeology assessments.
- Potential impacts of future flooding from all sources to and from the Proposed Development, including (but not limited to) a potential risk to construction workers during the construction phase, due to risk of fluvial/tidal and reservoir flooding.
- Pollution of surface watercourses within or near the Proposed Development Site (including associated development) during construction and decommissioning, due to chemical spillages, contaminant mobilisation or surface water run-off containing elevated concentrations of fine sediment.
- Water quality impacts to surface water features that may receive surface water runoff, cooling water or treated effluent discharges from the Proposed Development (e.g. DMW Plant, ETP and operation of the Flare). At this stage, information on effluent streams is limited and where discharges are likely to be proposed is under review. On-site treatment or return of effluent to Bran Sands WwTW are options. The use of amine will require specific waste management procedures. Options for discharge will be evaluated as part of the assessment process, including consideration of nutrient neutrality.
- Water quality impacts on receiving watercourses from an increase in foul drainage from the Proposed Development. At this stage it is assumed foul flows will be to either Bran Sands or Marske-on Sea WwTW where it will be treated in accordance with the prevailing regulatory requirements. Loads are expected to be small in comparison to the populations served by both works. Nevertheless, the assessment will qualitatively consider any change in risk from these emissions. Foul drainage from employment sites that do not increase overnight stays are exempt from any nutrient neutrality assessment requirements in respect of the Teesmouth and Cleveland Coast SPA.

6.3.21 The Production Facility will require a supply of water for operation. The source of this water is yet to be determined but may include reclaimed water from Bran Sands

WwTW or a supply of water from Northumbrian Water (which is expected to be raw water from the River Tees).

6.3.22 In both cases for water provision to the Proposed Development (i.e. use of reclaimed or raw water), the water would otherwise be present in or discharged to the River Tees. Thus, where the quality of this water remains fundamentally unchanged by its use by the Production Facility, it should be possible to discharge this water back to the River Tees whilst also maintaining the appropriate levels regarding nutrient loads. If the quality of the water is altered or it is discharged to another water feature further assessment will be undertaken, including assessment of nutrient neutrality if necessary.

6.3.23 An impact assessment will be undertaken to assess the potential effects on the water environment including a desk study to review relevant legislation, policy and guidance. The assessment will be primarily qualitative and based on a source-pathway-receptor approach. The significance of effects will be determined using best practice guidance, where the importance of the receptor is determined separately from the magnitude of impact. Where required the assessment will include recommendations for mitigation measures.

6.3.24 Hydromorphological site visits are proposed to scope potential watercourses affected, inform if watercourse crossings/alterations to existing structures are likely to need to be designed, and inform potential opportunities for mitigation or enhancement.

6.3.25 Various construction methodologies are being considered which include more intrusive approaches like open trench.

6.3.26 Although unlikely it is currently unknown at this stage whether there will be any new engineered surface water outfalls to watercourses, which can also lead to localised adverse impacts. Overall, a qualitative impact assessment shall be undertaken to determine the effect to the hydromorphology of watercourses.

6.3.27 As outlined above, at this stage, information on effluent streams and where discharges are likely to be proposed is still being evaluated. Whatever approach is progressed, the use of amine will require specific waste management procedures. The scope of assessment for these issues will be refined in consultation with relevant statutory consultees. The need for any field data collection will be determined, as well as whether further risk assessment or water quality modelling is needed.

6.3.28 A semi-quantitative surface water quality risk assessment will be undertaken for above ground infrastructure using the SuDS Manual Simple Index Approach (Construction Industry Research and Information Association (CIRIA) C753, 2016) to ensure that the surface water drainage system provides adequate treatment of runoff. This will not apply to areas of the Proposed Development Site where hazardous chemicals will be stored and used, with the risk from these locations assess qualitatively with reference to propose spillage and containment measures and emergency incident response plans.

6.3.29 Within Coatham Sands is a single open water pond that lies close to the former Redcar Steel works in an area of dunes that has formed across former slag heaps. Water quality of the pond was previously monitored by AECOM in 2020-2021 as part of baseline studies for the nearby NZT Project. It is proposed to gather 3 No. additional monthly water quality samples from the pond with the water tested at a suitable laboratory for a range of physico-chemical and nutrient parameters. If there is concern that the Proposed Development may result in an increase in nitrogen deposition on the pond, this baseline data will be used to carry out simple mass balance analysis to assess the risk of nutrient enrichment, and to provide advice on surface water runoff treatment and containment requirements if required.

Flood Risk Assessment and Drainage

6.3.30 In accordance with NPS EN-1 (DECC, 2011a) and the NPPF (Ministry of Housing, Communities and Local Government (MHCLG), 2021), applications for energy projects of 1ha or greater in Flood Zone 1 are to be accompanied by a FRA. An FRA will be prepared and will consider risks to the Proposed Development from flooding as well as the potential for the construction and operation to increase flood risk off-site. The Environment Agency and relevant Lead Local Flood Authorities (LLFAs) will be consulted for local water and flood data to inform the assessments and to confirm the assessment approach, in particular around the treatment of existing Environment Agency defences where these interface with the Proposed Development (e.g. western extents of Hydrogen Pipeline Corridor around Greatham). The assessment of flood risk will also take into account the most recent climate change allowances.

6.3.31 A surface water drainage strategy for the Main Site will be prepared to demonstrate the surface water runoff arising from the Proposed Development is managed sustainably and does not increase flood risk off-site.

Water Framework Directive Assessment

6.3.32 Due to the potential for adverse impacts on WFD designated water bodies as described above, a WFD assessment will be required. The assessment will be undertaken in accordance with the approach set out in PINS Advice Note 18: The Water Framework Directive (2017).

6.3.33 It is initially proposed that a Screening and Scoping WFD Assessment will be undertaken to define the components of the Proposed Development that are relevant, consider the impact pathways, assess the likely significance of any adverse impacts, and determine what the scope for mitigation might be. It is proposed to 'extend' this screening and scoping assessment to include a qualitative assessment of the Proposed Development to consider the potential for any non-compliance of the Proposed Development with WFD objectives for affected waterbodies, using readily available information and site observations.

6.3.34 Depending on the outcomes of the preliminary assessment, more detailed investigations may be required, which will be determined in consultation with the Environment Agency. The WFD Screening and Scoping Assessment will be prepared at the PEI stage and the Environment Agency consulted on the outcome.

Nutrient Neutrality Assessment

6.3.35 Natural England have identified the Teesmouth and Cleveland Coast SPA as a site that is impacted by excess nutrients. In particular, the Seal Sands area is known to be adversely impacted; excessive growth of algal mats are impacting feeding opportunities for the bird populations that the SPA is designated for. Any development in the catchment of the SPA that may lead to an increase in the nitrogen emissions must be supported by a robust nutrient neutrality assessment.

6.3.36 At this stage there remains uncertainty as to whether the Proposed Development will generate an increase in nitrogen in the Teesmouth and Cleveland Coast SPA catchment. Therefore, it is initially proposed to carry out a Nutrient Neutrality Screening Assessment at the PEI stage. This screening assessment will determine the need or otherwise for a full nutrient neutrality assessment for the Proposed Development. It will identify all possible sources of nitrogen from the Proposed Development (including atmospheric deposition, changes in discharges from local WwTW and direct treated effluent discharges) and consider (1) whether this is a new source or fundamentally already part of the catchments nutrient baseline; and (2) whether there is a pathway to the SPA. Where there is scope to reduce nutrient emissions compared to baseline from the site, these will also be considered. Natural England will be consulted on the outcome of the assessment during which the scope of further assessment will be agreed.

6.3.37 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.4 Geology, Hydrogeology and Contaminated Land

Baseline Conditions

Main Site A

6.4.1 The western part of the northern half of Main Site A (the 'Foundry North') and the entirety of the southern half of Main Site A (the 'Foundry South') are understood to have been previously reclaimed land from the River Tees.

6.4.2 Recent studies undertaken by bp indicate that the following geological sequence underlies the Foundry North:

- variable depth of Made Ground to 10 m below ground level (bgl), typically to 2.0 m to 6.0 m where base was proven;
- Tidal Flat Deposits;
- Glacial Till; and
- Mudstone bedrock (comprising Mercia Mudstone Group, Penarth Formation and Redcar Mudstone) from 13.50 m to 15.15 m bgl.

6.4.3 The following geological sequence underlies the Foundry South:

- variable depth of Made Ground to 7 m bgl, typically to 2.0 m to 6.0 m where base was proven;

- Tidal Flat Deposits to a maximum depth of 18.0 m bgl;
- Glacial Till identified between 12.1 m to 17.3 m bgl where encountered; and
- Mudstone bedrock (comprising Mercia Mudstone Group, Penarth Formation and Redcar Mudstone).

6.4.4 The Superficial Tidal Flat Deposits underlying Main Site A are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. Whilst not identified in the ground investigation, Glacio-lacustrine deposits may be present. These designated as Unproductive Strata when clay or a Secondary A aquifer when silt, Redcar Mudstone Formation is designated as Secondary (Undifferentiated) aquifer, the Penarth Formation is designated as a Secondary (Undifferentiated)/Secondary B aquifer and the Mercia Mudstone bedrock is designated as Secondary B aquifer.

6.4.5 There are no SPZs, Drinking Water Protected Areas, Drinking Water Safeguard Zones (Surface Water and Groundwater) or groundwater, potable water or surface water abstraction licences within 1 km of Main Site A.

6.4.6 Groundwater is present within the Made Ground, superficial deposits and bedrock underlying Main Site A. The groundwater in the Made Ground and superficial deposits is assumed to be in hydraulic continuity. There is potential for hydraulic connection between the superficial deposits and bedrock.

6.4.7 Records indicate that within the Foundry North part of Main Site A, groundwater is present between 2.37 m AOD and 3.62 m AOD with an apparent flow towards the west to north-west. Within the Foundry South part of Main Site A, records indicate that groundwater is present between 2.29 m AOD and 5.48 m AOD, with an apparent flow towards the north-west.

6.4.8 The following are potential sources of contamination at the Foundry North part of Main Site A:

- former steelworks: blast furnace, coke ovens, gas holders, by-products plant, coke stock, effluent plant and various storage plants;
- Made Ground including slag and clinker with visual/olfactory evidence of contamination including hydrocarbon and NH_3 odours;
- localised exceedances of industrial/commercial Generic Assessment Criteria (GAC) for cyanide and selected Polycyclic Aromatic Hydrocarbons (PAHs) in Made Ground and Tidal Flat deposits;
- localised asbestos fibres in Made Ground; and
- exceedances of water quality criteria in soil leachate and groundwater in Made Ground and Tidal Flats.

6.4.9 The following are potential sources of contamination at the Foundry South part of Main Site A:

- former steel works including blended ore stocks and coke crushing plant;
- Made Ground with visual/ olfactory evidence of contamination including hydrocarbon and NH_3 odours, orange / iron staining, white mineralisation/ sulphur mineralisation on slag, localised tar cobbles, sulphur odours;
- localised asbestos fibres in Made Ground; and
- localised exceedances of industrial/commercial GAC for cyanide and selected PAHs in Made Ground and Tidal Flat deposits.

6.4.10 The following potential sources of off-site contamination are present within the vicinity of Main Site A:

- Bran Sands licensed landfill;
- Bran Sands WwTW;
- Warrenby 3A / CLE31 landfill on Teesworks Long Acres site;
- electrical substations;
- Sahaviriya Steel Industries (SSI) Steelworks (including blast furnace, sinter plant, power station, crushing and blending plant and former pellet plant);
- former Redcar and Coatham iron works;
- known Heavy Fuel Oil spill adjacent to south-east corner of the Main Site; and
- railway lines and sidings.

6.4.11 The ground beneath Main Site A has been identified in the STDC Regeneration Master Plan (RMP) (STDC, 2019) in an assessment of ground hazards. It is currently likely to contain a number of potential contaminants from former historic use, potentially including heavy metals, asbestos, sulphates and hydrocarbons. The potential contaminants may be associated with a former coke works and by-products and a former iron making site (Redcar Blast Furnace) identified on the STDC RMP potential major hazards map.

CO_2 Export Corridors (Main Site A)

6.4.12 Publicly available British Geological Survey (BGS) borehole records and geological maps (BGS, 2022) indicate that the CO_2 Export Corridors are underlain by the following sequence of strata:

- Made Ground;
- Tidal Flat Deposits (Superficial Deposits); and
- Redcar Mudstone Formation (Bedrock).

6.4.13 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the entire area of the CO_2 Export Corridors. These deposits are likely to be associated with the land that has been reclaimed from the River Tees.

6.4.14 The CO_2 Export Corridors are located immediately adjacent to the Main Site. Therefore, historical GI data for the areas adjacent to the CO_2 Export Corridors is summarised in the section for Main Site A.

6.4.15 The Superficial Tidal Flat Deposits underlying the CO_2 Export Corridors are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt. If present, the Glacio-lacustrine deposits are designated as Unproductive Strata when clay or a Secondary A aquifer when silt, whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Mercia Mudstone bedrock is designated as Secondary B aquifer, the Penarth Formation is designated as a Secondary (Undifferentiated)/Secondary B aquifer and the Redcar Mudstone is designated as a Secondary (Undifferentiated) aquifer.

6.4.16 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the CO_2 Export Corridors, nor are there any groundwater, potable water or surface water abstraction licences located within 1 km of it.

6.4.17 The potential sources of off-site contamination present within the vicinity of the CO_2 Export Corridors, and the nearby authorised and historical landfills, are the same as those listed in relation to the Main Site A.

6.4.18 The ground to the north of the CO_2 Export Corridors has been identified in the STDC RMP in an assessment of ground hazards. It is likely to contain a number of potential contaminants from former historic use, such as heavy metals, asbestos, sulphates and hydrocarbons. The potential contaminants may be associated with a former coke works and by-products, former iron and steel works and a former steel making site (Redcar Blast Furnace) located to the north, as identified on the STDC RMP major ground hazards map.

Hydrogen Pipeline Corridor (Main Site A)

6.4.19 Publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Hydrogen Pipeline Corridor is underlain by the following sequence of strata:

- Made Ground;
- Superficial deposits:
  - Tidal Flat Deposits;
  - Alluvium (Clay, Silt, Sand and Gravel);
  - Blown Sand;
  - Devensian Glaciolacustrine Deposits (Clay and Silt); and
  - Devensian Glacial Till (Boulder Clay).
- Sherwood Sandstone Group (in the western part of the Hydrogen Pipeline Corridor); and

- Mudstone bedrock (comprising Mercia Mudstone Group, Penarth Formation and Redcar Mudstone), in the eastern part of the Hydrogen Pipeline Corridor.

6.4.20 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the centre and most of the eastern area of the Hydrogen Pipeline Corridor. These deposits are likely to be associated with the land that has been reclaimed from the River Tees.

6.4.21 Historical GI data from Wardell Armstrong (2016) relating to the Seal Sands area located adjacent to the Hydrogen Pipeline Corridor indicates that the Made Ground present could be up to 5 m thick and be associated with fill material from the land reclamation.

6.4.22 The area within Seal Sands was used for historical landfilling for construction, non-hazardous industrial materials, slag and inert waste. A GI Factual Report from RSK (2007) noted that Made Ground is present to 3.7 m bgl with hydrocarbon and organic odours noted. Tidal Flat Deposits were encountered between 0.1 m bgl and 27 m bgl, and were approximately 15 m thick. The deposits comprised silt, sand and clay, and were found to be underlain by stiff boulder clay (Glacial Till), approximately 10 m thick. Bedrock was encountered between 25.5 m bgl and 28.5 m bgl. Monitoring undertaken by ConocoPhillips (RSK, 2007) indicated that groundwater was encountered between 0.8 m bgl and 1 m bgl.

6.4.23 The Superficial Tidal Flat Deposits underlying the Hydrogen Pipeline Corridor are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt. The Devensian Glacial Till Deposits are designated as a Secondary (Undifferentiated) Aquifer. The Alluvial Deposits and the Blown Sand Deposits are designated as a Secondary A Aquifer. The Glaciolacustrine Deposits (clay and silt) underlying the Hydrogen Pipeline Corridor are designated as Unproductive Strata where clay and a Secondary A aquifer where silty.

6.4.24 The Sherwood Sandstone Group is designated as a Principal Aquifer. Mercia Mudstone Group is designated as a Secondary B Aquifer. The Penarth Formation is designated as a Secondary (Undifferentiated)/Secondary B aquifer. The Redcar Mudstone Formation is designated as a Secondary Undifferentiated Aquifer.

6.4.25 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Hydrogen Pipeline Corridor.

6.4.26 The Groundsure (2022) Enviro Data Viewer indicates that a number of historic and authorised landfills are located within approximately 300 m of the Hydrogen Pipeline Corridor:

- Cowpen Bewley Landfill Site;
- West of Wolviston to Seal Sands Link Road Historic Landfill Site;
- Seal Sands Historic Landfill Site;
- South of Seal Sands Historic Landfill Site;

- Bran Sands Landfill Site;
- Warrenby 3A / CLE31 landfill on Teesworks Long Acres site;
- Wilton Perimeter Mounds Landfill Site;
- Redcar Trunk Road Historic Landfill Site;
- ICI No. 2 Teesport Historic Landfill Site;
- ICI No. 3 Teesport Landfill Site;
- CLE 3/8 Landfill Site;
- Fire Bund Port Clarence Historic Landfill;
- Port Clarence Non-Hazardous Landfill Site; and
- Disused Railway Cutting Historic Landfill Site.

6.4.27 However, it should be noted that the extent of the Hydrogen Corridor is anticipated to be refined. Therefore, the number of landfills in its proximity may change.

6.4.28 The ground immediately adjacent to the Hydrogen Pipeline Corridor has been identified in the STDC RMP in an assessment of ground hazards. It is likely to contain a number of potential contaminants from current land use, such as heavy metals, asbestos, sulphates, hydrocarbons and inorganic and organic compounds. The potential contaminants are associated with a hazardous waste landfill and an iron and steel making by-products landfill (former SSI high tip) identified on the STDC RMP major ground hazards map.

Natural Gas Connection Corridor (Main Site A)

6.4.29 Publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Natural Gas Connection Corridor is underlain by the following sequence of strata:

- Made Ground;
- Blown Sand (may be present underlying the eastern boundary of the Natural Gas Connection Corridor) (Superficial);
- Tidal Flat Deposits (Superficial);
- Glacial Till/Glacio-lacustrine deposits; and
- Redcar Mudstone Formation (Bedrock).

6.4.30 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the entire area of the Natural Gas Connection Corridor. These deposits are likely to be associated with the land that has been reclaimed from the River Tees.

6.4.31 The Natural Gas Corridor is located immediately adjacent to Main Site A. Therefore, historical GI data for the areas adjacent to the Natural Gas Corridor are summarised in the section relating to Main Site A.

6.4.32 The Superficial Tidal Flat Deposits underlying the Natural Gas Connection Corridor are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt, the Glacio-lacustrine deposits are designated as Unproductive Strata when clay or a Secondary A aquifer when silt, whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Mercia Mudstone bedrock is designated as Secondary B aquifer.

6.4.33 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Natural Gas Connection Corridor.

6.4.34 The Groundsure (2022) Enviro Data Viewer indicates that one landfill is located within 0.3 km of the Natural Gas Corridor. The Bran Sands authorised landfill, which accepts special waste, is located approximately 270 m south of the Natural Gas Corridor.

6.4.35 The ground immediately adjacent to the Natural Gas Connection Corridor has been identified in the STDC RMP in an assessment of ground hazards. It is likely to contain a number of potential contaminants from former historic use, such as heavy metals, asbestos, sulphates and hydrocarbons. The potential contaminants are associated with a former iron and steel works which falls within the Natural Gas Connection Corridor as identified on the STDC RMP major ground hazards map.

Electrical Connection Corridor (Main Site A)

6.4.36 Publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Electrical Connection Corridor is underlain by the following sequence of strata:

- Made Ground;
- Superficial Deposits:
  - Tidal Flat Deposits;
  - Blown Sand;
  - Devensian Glaciolacustrine Deposits (Clay and Silt); and
  - Devensian Glacial Till.
- Mudstones from the Mercia Mudstone Group, Penarth Formation and the Redcar Mudstone Formation.

6.4.37 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the western half of the Electrical Connection Corridor. These deposits are likely to be associated with the land that has been reclaimed from the River Tees.

6.4.38 Historical BGS boreholes located to the south of the Electrical Connection Corridor identified Made Ground in one borehole to a depth of 5 m bgl. Glaciolacustrine Deposits and Devensian Clay were identified between 0.2 m bgl and 13 m bgl with

approximate thickness of 11 m. The Redcar Mudstone was encountered at 11.2 m bgl and was described as a highly weathered grey mudstone. Groundwater was encountered further south between 2 m and 3 m bgl within soft silty clay.

6.4.39 Historical BGS boreholes and trial pit data from a recent bp study indicates that Made Ground is present to the immediate east of the Electrical Connection Corridor, within the existing British Steel Lackenby site. The Made Ground may be present to 5.8 m bgl and is comprised of slag, brick, waste demolition and cohesive fill. The superficial deposits are comprised of soft to firm brown silty clay (Glaciolacustrine Deposits) and stiff brown boulder clay (Glacial Till) to 10.7 m bgl. Stiff weathered mudstone and shale were encountered in historical boreholes. Groundwater was encountered between 0.7 m bgl and 3.4 m bgl at the interface of Made Ground and natural cohesive deposits in 38 out of 75 trial pits.

6.4.40 Further GI data for the area immediately to the north of the Electrical Connection Corridor is summarised in the previous section which relates to Main Site A.

6.4.41 The Blown Sand Deposits underlying the Electrical Connection Corridor are designated as a Secondary A aquifer. The Superficial Tidal Flat Deposits are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt, the Glacio-lacustrine deposits are designated as Unproductive Strata when clay or a Secondary A aquifer when silt, whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Mercia Mudstone Group is designated as a Secondary B Aquifer. The Penarth Formation is designated as a Secondary (Undifferentiated)/Secondary B aquifer and the Redcar Mudstone Formation is designated as a Secondary Undifferentiated Aquifer.

6.4.42 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Electrical Connections Corridor.

6.4.43 The Groundsure (2022) Enviro Data Viewer indicates that a number of historic and authorised landfills are located within 0.3 km of the Electrical Connection Corridor.

6.4.44 The following are wholly or partially located within the Electrical Connection Corridor:

- The Redcar Trunk Road Landscaping historic landfill site (last input date is recorded as 10th August 1979);
- The Wilton Perimeter Mounds Industrial Waste Landfill (factory curtilage) authorised site;
- Mushroom Grove Allotments historic landfill site (last input date recorded as 2nd April 1985); and
- Teesdock Road historic landfill site (last input date of 31st March 1983).

6.4.45 In addition to the above, Bran Sands authorised landfill site, which accepted special waste, is adjacent to the western boundary of the Electrical Connection Corridor. Warrenby Landfill Site, which accepts household, commercial and industrial waste is

located adjacent to the north-east boundary of the Electrical Connection Corridor. ICI No 2 Teesport (authorised landfill site) is located approximately 100 m west of the Electrical Connection Corridor.

6.4.46 The ground beneath the Electrical Connection Corridor has been identified in the STDC RMP in an assessment of ground hazards. It is likely to contain a number of potential contaminants from former historic use and current land use, such as heavy metals, asbestos, sulphates and hydrocarbons. The potential contaminants may be associated with a former iron and steel works, a current iron and steel making closed landfill and iron and steel making waste recycling site identified on the STDC RMP major ground hazards map.

Water Connections Corridor (Main Site A)

6.4.47 Publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Water Connections Corridor is underlain by the following strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glaciolacustrine Deposits (Superficial);
- Glacial Till (Superficial);
- Blown Sand (may be present underlying eastern boundary of the Water Connections Corridor) (Superficial); and
- Redcar Mudstone Formation (Bedrock).

6.4.48 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the entire northern section of the Water Connections Corridor. These deposits are likely to be associated with the land that has been reclaimed from the River Tees. The rest of the Water Connections Corridor is not mapped as Made Ground but Made Ground is likely to be present, given current and historical development in the area.

6.4.49 The Water Connections Corridor is located immediately adjacent to Main Site A and extends approximately 1.5 km south-east of the corridor. Historical GI data for the areas adjacent to the Water Connections Corridor are summarised under the section relating to Main Site A.

6.4.50 The Blown Sand Deposits underlying the Water Connections Corridor are designated as a Secondary A aquifer. The Superficial Tidal Flat Deposits are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt, the Glacio-lacustrine deposits are designated as Unproductive Strata when clay or a Secondary A aquifer when silt. Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Redcar Mudstone Formation is designated as a Secondary Undifferentiated Aquifer.

6.4.51 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Water Connections Corridor.

6.4.52 The Groundsure (2022) Enviro Data Viewer indicates that one active and one historical landfill are located within the Water Connections Corridor. Wilton, Perimeter Mounds is located in the central area of the Water Connections Corridor and accepts industrial waste. The historical landfill site located in the central area of the Water Connections Corridor relates to Redcar Trunk Road Landscaping (last input date recorded as August 1979). Two authorised landfills and one historic landfill are also located within 0.3 km of the Water Connections Corridor:

- Bran Sands licensed landfill, which accepted special waste, is adjacent to the western boundary of the Water Connections Corridor;
- Warrenby Landfill is located adjacent to the east of the Water Connections Corridor and accepts household, commercial and industrial waste; and
- Teesport Eston Tip (historic landfill) is located approximately 300 m west of the Water Connections Corridor (last input date recorded as 17th September 1993).

6.4.53 The ground immediately adjacent to the Water Connections Corridor has been identified in the STDC RMP in an assessment of ground hazards. It is likely to contain a number of potential contaminants from former historic use potentially including heavy metals, asbestos, sulphates and hydrocarbons. The potential contaminants may be associated with a former iron and steel works which encroaches onto the boundary of the Water Connections Corridor as identified on the STDC RMP major ground hazards map.

Other Gases Connection Corridor (Main Site A)

6.4.54 Publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Other Gases Connection Corridor is underlain by the following strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glacial Till;
- Glacio-lacustrine deposits;
- Blown Sand (may be present underlying small portion of the north-eastern bend of the Other Gases Connection Corridor) (Superficial);
- Penarth Formation – Mudstone (Bedrock); and
- Redcar Mudstone Formation (Bedrock).

6.4.55 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies nearly the entirety of the Other Gases Connection Corridor. These deposits are likely to be associated with the land that has been reclaimed from the River Tees. A small portion of the north-eastern bend in the corridor is not mapped as Made Ground but Made Ground is likely to be present, given current and historical development in the area.

6.4.56 The Other Gases Connection Corridor is located immediately adjacent to Main Site A and extends approximately 2 km to the south-east. Therefore, historical GI data for

the areas adjacent to the Other Gases Connection Corridor are summarised under the section above relating to Main Site A.

6.4.57 The Blown Sand Deposits underlying the Other Gases Connection Corridor are designated as a Secondary A aquifer. The Superficial Tidal Flat Deposits are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt, Glacio-lacustrine deposits are designated as Unproductive Strata when clay or a Secondary A aquifer when silt, whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Penarth Formation is designated as a Secondary (Undifferentiated)/Secondary B aquifer. The Redcar Mudstone Formation is designated as a Secondary Undifferentiated Aquifer.

6.4.58 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Other Gases Connection Corridor.

6.4.59 The Groundsure (2022) Enviro Data Viewer indicates that there are no active or historical landfill are located within the Other Gases Connection Corridor. The following authorised and historical landfills are located within 0.3 km of the corridor:

- Bran Sands licensed landfill (now closed), which accepted special waste, is adjacent to the western boundary of the Other Gases Connection Corridor;
- Teesport Eston Tip (historic landfill) is located approximately0.3 km west of the Other Gases Connection Corridor (last input date recorded as 17th September 1993).

6.4.60 The ground adjacent to the Other Gases Connection Corridor has been identified in the STDC RMP in an assessment of ground hazards. It is likely to contain a number of potential contaminants from former historic use, such as heavy metals, asbestos, sulphates and hydrocarbons. The potential contaminants may be associated with a former iron and steel works to the north-east as identified on the STDC RMP major ground hazards map.

Main Site B – RBT

6.4.61 The geology, hydrogeology and contaminated land baseline data presented for the Main Site A is relevant for the Main Site B.

6.4.62 The following geological sequence underlies Main Site B:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glaciolacustrine Deposits (Superficial);
- Glacial Till (Superficial); and
- Mercia Mudstone Formation (Bedrock).

6.4.63 The Superficial Tidal Flat Deposits underlying Main Site B are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt, the Glacio-lacustrine deposits are designated as Unproductive Strata when

clay or a Secondary A aquifer when silt, whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Mercia Mudstone bedrock is designated as Secondary B aquifer.

6.4.64 Main Site B has been used as an bulk import terminal for coal and iron ore amongst other raw materials for the steel industry for over 40 years. In addition to current remaining stockpiles, washed-in fines and leachable contamination from stockpiled materials from may be present below ground. Main Site B is directly adjacent to the Foundry (Main Site A), a site that has been identified in the STDC RMP as likely to contain a number of potential contaminants.

6.4.65 Potential sources of off-site contamination are considered to be the same as those identified for Main Site A.

CO_2 Export Corridor – RBT (Main Site B) Extension

6.4.66 The geology, hydrogeology and contaminated land baseline data detailed for CO_2 Export Corridor (Main Site A) is relevant to the CO_2 Export Corridor Extension associated with Main Site B.

6.4.67 The Superficial Tidal Flat Deposits underlying the CO_2 Export Corridor Extension are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt, the Glacio-lacustrine deposits are designated as Unproductive Strata when clay or a Secondary A aquifer when silt, whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Mercia Mudstone bedrock is designated as Secondary B aquifer, the Penarth Formation is designated as a Secondary (Undifferentiated)/Secondary B aquifer and the Redcar Mudstone is designated as a Secondary (Undifferentiated) aquifer.

Hydrogen Pipeline Corridor - RBT (Main Site B) Extension

6.4.68 The geology, hydrogeology and contaminated land baseline data detailed for the Hydrogen Pipeline Corridor (associated with Main Site A) is relevant for the Hydrogen Pipeline Corridor Extension associated with Main Site B, except that publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Hydrogen Pipeline Corridor Extension is underlain by the following sequence of strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glacial Till/Glacio-lacustrine deposits;
- Mercia Mudstone Group;
- Penarth Formation; and
- Redcar Mudstone Formation.

6.4.69 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the Hydrogen Pipeline Corridor Extension. These deposits are likely to be associated with the land that has been reclaimed from the River Tees and subsequent development as RBT.

6.4.70 The Superficial Tidal Flat Deposits underlying the Hydrogen Pipeline Corridor Extension are designated as either a Secondary (Undifferentiated) aquifer when clay, or a Secondary A aquifer for sand and silt. The Devensian Glacial Till Deposits are designated as a Secondary (Undifferentiated) Aquifer. The Alluvial Deposits are designated as a Secondary A Aquifer. The Glaciolacustrine Deposits (clay and silt) underlying the corridor extension are designated as Unproductive Strata where clay and a Secondary A aquifer where silty.

6.4.71 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Hydrogen Pipeline Corridor extension.

Natural Gas Connection Corridor – RBT (Main Site B) Extension

6.4.72 The geology, hydrogeology and contaminated land baseline data detailed for the Natural Gas Connection Corridor (associated with Main Site A) is relevant for the Natural Gas Connection Corridor Extension associated with Main Site B, except that publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Natural Gas Connection Corridor Extension is underlain by the following sequence of strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glacial Till/Glacio-lacustrine deposits;
- Mercia Mudstone Group;
- Penarth Formation; and
- Redcar Mudstone Formation.

6.4.73 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the Natural Gas Connection Corridor Extension. These deposits are likely to be associated with the land that has been reclaimed from the River Tees and subsequent development as RBT.

6.4.74 The Superficial Tidal Flat Deposits underlying the Natural Gas Connection Corridor Extension are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt. The Devensian Glacial Till Deposits are designated as a Secondary (Undifferentiated) Aquifer. The Alluvial Deposits are designated as a Secondary A Aquifer. The Glaciolacustrine Deposits (clay and silt) underlying the corridor extension are designated as Unproductive Strata where clay and a Secondary A aquifer where silty.

6.4.75 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Natural Gas Connection Corridor Extension.

Electrical Connection Corridor – RBT (Main Site B) Extension

6.4.76 The geology, hydrogeology and contaminated land baseline data detailed for the Electrical Connection Corridor (associated with Main Site A) is relevant for the

Electrical Connection Corridor Extension associated with Main Site B, except that publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Electrical Connection Corridor Extension is underlain by the following sequence of strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glacial Till/Glacio-lacustrine deposits;
- Mercia Mudstone Group;
- Penarth Formation; and
- Redcar Mudstone Formation.

6.4.77 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the Electrical Connection Corridor Extension. These deposits are likely to be associated with the land that has been reclaimed from the River Tees and subsequent development as RBT.

6.4.78 The Superficial Tidal Flat Deposits underlying the Electrical Connection Corridor Extension are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt. The Devensian Glacial Till Deposits are designated as a Secondary (Undifferentiated) Aquifer. The Alluvial Deposits are designated as a Secondary A Aquifer. The Glaciolacustrine Deposits (clay and silt) underlying the corridor extension are designated as Unproductive Strata where clay and a Secondary A aquifer where silty.

6.4.79 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Electrical Connection Corridor Extension.

Water Connections Corridor – RBT (Main Site B) Extension

6.4.80 The geology, hydrogeology and contaminated land baseline data detailed for the Water Connections Corridor (associated with Main Site A) is relevant for the Water Connections Corridor Extension associated with Main Site B, except that publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Water Connections Corridor Extension is underlain by the following sequence of strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glacial Till/Glacio-lacustrine deposits;
- Mercia Mudstone Group;
- Penarth Formation; and
- Redcar Mudstone Formation.

6.4.81 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the Water Connections Corridor Extension. These deposits are likely to be associated with the land that has been reclaimed from the River Tees and subsequent development as RBT.

6.4.82 The Superficial Tidal Flat Deposits underlying the Water Connections Corridor Extension are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt. The Devensian Glacial Till Deposits are designated as a Secondary (Undifferentiated) Aquifer. The Alluvial Deposits are designated as a Secondary A Aquifer. The Glaciolacustrine Deposits (clay and silt) underlying the corridor extension are designated as Unproductive Strata where clay and a Secondary A aquifer where silty.

6.4.83 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Water Connections Corridor Extension.

Other Gases Connection Corridor – RBT (Main Site B) Extension

6.4.84 The geology, hydrogeology and contaminated land baseline data detailed for the Other Gases Connection Corridor (associated with Main Site A) is relevant for the Other Gases Corridor Extension associated with Main Site B, except that publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Other Gases Connection Corridor Extension is underlain by the following sequence of strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glacial Till/Glacio-lacustrine deposits;
- Mercia Mudstone Group;
- Penarth Formation; and
- Redcar Mudstone Formation.

6.4.85 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the Other Gases Corridor Extension. These deposits are likely to be associated with the land that has been reclaimed from the River Tees and subsequent development as RBT.

6.4.86 The Superficial Tidal Flat Deposits underlying the Other Gases Corridor Extension are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt. The Devensian Glacial Till Deposits are designated as a Secondary (Undifferentiated) Aquifer. The Alluvial Deposits are designated as a Secondary A Aquifer. The Glaciolacustrine Deposits (clay and silt) underlying the corridor extension are designated as Unproductive Strata where clay and a Secondary A aquifer where silty.

6.4.87 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Other Gases Corridor Extension.

Scope of the Assessment

6.4.88 The following potential impacts may be associated with the Proposed Development:

- disturbance of contaminated soils and perched groundwater, and the creation of new pathways to sensitive receptors (including construction workers and controlled waters) during construction;
- pollution of surface watercourses within or near the Proposed Development Site during construction and decommissioning, due to spillages or polluted surface water run-off entering a watercourse (if an appropriate Environmental Management Plan is not adhered to); and
- pollution of surface watercourses within or near the Proposed Development Site during operation, due to spillages or polluted surface water runoff entering the watercourse (if materials are not appropriately stored at the Proposed Development Site in accordance with the environmental permit and an appropriate Environmental Management Plan/ system, and/or appropriate drainage systems are not implemented and maintained).

6.4.89 A Phase 1 desk-based assessment (DBA) has been completed for Main Site A to identify potential contaminative uses of the Proposed Development Site and to identify the potential for land contamination and potential pathways to sensitive receptors. A similar DBA is in preparation for Main Site B. The DBAs consider the potential for contaminants associated with current and historic land use in and around the Proposed Development Site to be present. A conceptual site model (CSM) will be developed for the land potentially affected by the Proposed Development.

6.4.90 The results of the DBA and CSM will be used to assess data gaps and uncertainties and, if required, an initial scope for additional site investigation. It is anticipated that the requirements for intrusive investigation would be discussed and agreed in advance with the Environment Agency and RCBC, as appropriate.

6.4.91 The ES will include an assessment of the potential impacts of the Proposed Development upon existing ground conditions, including the potential for the Proposed Development to result in land contamination, and how these will be prevented or minimised.

6.4.92 The EIA will inform the design as to where mitigation measures may be required during the Proposed Development's construction, operation and decommissioning. These mitigation measure may include the recommendation for further intrusive investigation to address residual data gaps or better delineate identified contamination hotspots or plumes, quantitative risk assessment, remediation and validation, although it is envisaged that the current operator of the Proposed Development Site will undertake appropriate site clean-up prior to commencement

of the Proposed Development. The assessment will also make recommendations for possible mitigation measures to be employed by contractors, on a precautionary basis, to allow for the encounter of previously unidentified contamination during the construction phase.

6.4.93 The scope of assessment set out above would be applied whether Main Site A or B (and associated corridors) is taken forward to the final development design.

6.5 Noise and Vibration

Baseline Conditions

6.5.1 Main Site A is remote from larger areas of residential receptors, with the nearest residential Noise Sensitive Receptor (NSR) to Main Site A located approximately 1.3 km to the east (Marsh House Farm/ Marsh Farmhouse). The nearest residential settlements are the town of Redcar (approximately 2.6 km east of Main Site A), including the borough of Dormanstown (approximately 1.3 km south-east of Main Site A).

6.5.2 Main Site B is also remote from larger areas of residential receptors, with the nearest residential NSR to Main Site B located approximately 2.2 km to the east (Marsh House Farm/ Marsh Farmhouse). The nearest residential settlements are the town of Redcar (approximately 3.5 km east of Main Site B), including the borough of Dormanstown (approximately 2.7 km south-east of Main Site B).

6.5.3 The nearest residential settlements to the connection corridors are:

- Dormanstown, located approximately 0.4 km to the east of the Water Connections Corridor, approximately 0.7 km to the east of the Hydrogen Pipeline Corridor and Electrical Connection Corridor, approximately 0.9 km to the south-east of the Natural Gas Connection Corridor and approximately 0.9 km to the south-east of the CO_2 Export Corridors;
- Redcar, located approximately 1.8 km to the north-east of the Electrical Connection Corridor, approximately 2 km to the north-east of the Hydrogen Pipeline Corridor, approximately 2 km to the east of the Natural Gas Connection Corridor and Water Connections Corridor, and approximately 2 km to the-east of the CO_2 Export Corridors;
- Kirkleatham, which is to the immediate east of the Hydrogen Pipeline Corridor, where it extends into the Wilton International Estate;
- Billingham and Wolviston, located approximately 1.2 km south-west and 0.6 km west of the Hydrogen Pipeline Corridor's western extent respectively;
- Grangetown, adjacent to the Electrical Connection Corridor at its southern end; and
- Greatham, located approximately 0.6 km north-west of the Hydrogen Pipeline Corridor.

6.5.4 It is noted that there are areas of public/private amenity close to the Proposed Development Site, mainly to the north around Coatham.

6.5.5 As outlined in more detail in Section 6.6: Ecology and Nature Conservation, the Teesmouth and Cleveland Coast SPA, Ramsar Site and SSSI is located to the immediate north of both Main Sites A and B. In addition, as outlined in Section 6.7: Ornithology and Section 6.8: Marine Ecology, the Proposed Development has the potential to impact on sensitive receptors relevant to these topics which will need to be considered as part of the assessment.

6.5.6 Baseline noise data is available from the results of surveys which were undertaken in 2019 and 2020 for the NZT Project (immediately east of the Proposed Development Sites). From a review of the available data, the existing dominant sound in the area is from industrial and road traffic noise sources.

6.5.7 Further project specific baseline noise monitoring will be carried out to inform the noise and vibration assessment for the Proposed Development.

6.5.8 Consultation with RCBC, STBC and HBC will be undertaken to determine NSRs and the suitability of existing data available for reuse (e.g. from the NZT Project). The extent of the Study Area will be defined to include the NSRs/communities in each direction from the Proposed Development Site, that may be affected by noise or vibration during construction or operation of the Proposed Development.

6.5.9 The results of the baseline sound surveys will be reviewed and discussed with consultees to determine whether further baseline monitoring is required. The monitoring locations will also be reviewed to ensure sufficient data is gathered to inform the application for the Environmental Permit for the Production Facility. It is also noted that monitoring surveys need to be carefully scheduled to avoid periods where known noisy activities are taking place in the area, such as demolition works, to not affect the data gathered.

6.5.10 Baseline sound survey requirements at identified sensitive ecological receptors will be agreed in conjunction with the project ecologists and Natural England.

6.5.11 There are no substantive differences in the baseline conditions between Main Site A and Main Site B. Therefore, the baseline conditions as outlined above apply and are relevant to both. In addition, the proposed baseline sound survey monitoring locations are appropriate to cover both Mains Sites A and B and the associated connection corridors.

Scope of the Assessment

6.5.12 The following potential impacts are likely to be associated with the Proposed Development:

- construction and decommissioning noise and vibration impacts (including construction and decommissioning traffic on public roads); and
- operational noise impacts from new plant, specifically at the Main Site.

6.5.13 Based on the distance between the Proposed Development Site and the nearest receptors, significant vibration impacts associated with operational activities are considered unlikely, although they will still be considered in brief as part of the EIA.

6.5.14 The scope of the noise and vibration assessment will include the following:

- identification of the nearest NSRs (as outlined above);
- liaison with the LPA's Environmental Health Officers (EHOs) and the project ecologists to agree scope and methodology of noise and vibration assessment, including baseline sound monitoring locations and measurement protocol (monitoring procedures will conform to BS 7445), including verification of use of existing data;
- establishment of baseline sound levels in the locality; and
- assessment of the impact of predicted noise levels at the nearest NSRs from construction, operation and decommissioning of the Proposed Development and associated connections including:
  - construction noise and vibration (including construction traffic on public roads); and
  - operational noise and vibration.

6.5.15 The NSRs will be representative of residential and ecological receptors. The data collected will also be used to inform the heritage assessment (with respect to potential impacts upon the settings of heritage assets).

6.5.16 The noise and vibration assessment will be carried out in accordance with the following guidance:

- DECC (2011) Overarching NPS for Energy EN-1 and revised NPS EN-1 (BEIS);
- 'Noise Policy Statement for England' (NPSE) (2010); and
- PPG for 'Noise' (2019a).

6.5.17 Additionally, reference will be made to (but not limited to) the following:

- British Standard (BS) 5228-1 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Part 1: Noise'.
- BS 5228-2 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Part 2: Vibration'.
- International Organisation for Standardisation (ISO) 9613-2: 1996 'Attenuation of sound during propagation outdoors. Part 2: General method of calculation'.
- BS 4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.
- BS 7385: 1993 'Evaluation and measurement for vibration in buildings';
- BS 6472: 2008 'Guide to evaluation of human exposure to vibration in buildings'.

- Control of Pollution Act 1974 (as amended).
- 'Calculation of Road Traffic Noise' (Department for Transport, 1988, "CRTN").
- Design Manual for Road and Bridges (DMRB) LA111 (Revision 2)' (Highways England, 2020).

6.5.18 Noise levels associated with enabling and construction works will be calculated (at chosen NSRs) using the data and procedures given in BS 5228. Further detail on construction working hours will be presented within the PEI Report and ES and will be used to inform the assessment of construction related impacts.

6.5.19 The need for prediction of vibration levels will be further considered depending upon the types of activities required during the construction of the Proposed Development. The assessment of vibration due to construction works will include the electrical, water and gas connections as required.

6.5.20 The construction of the Proposed Development may have a potential impact on traffic flows on local roads around the Proposed Development Site. The change in road traffic noise levels, at a selection of relevant receptors, will be predicted using the standard methodology outlined in the CRTN. The predictions will be based on baseline and with-development traffic data provided as part of the proposed Transport Assessment (TA) as outlined in Section 6.9: Traffic and Transportation.

6.5.21 The significance of changes in road traffic noise levels will be assessed based on a range of relevant guidance including the DMRB.

6.5.22 The potential impacts and effects of decommissioning are likely to be comparable to, or less than, those for construction activities.

6.5.23 The assessment of operational noise impacts will use computer noise modelling software (SoundPLAN or Cadna-A), based on information on indicative plant layout, and the operating conditions and the levels of noise generated by plant items and vehicles, as provided by the design team. The modelling software enables a detailed implementation of the proposed equipment and buildings, existing surrounding buildings and ground features. The software implements the methodology in ISO 9613-2 for the calculation of noise levels from industrial sources. Any assumptions made to develop the noise modelling will be clearly outlined within the assessment and its technical appendices.

6.5.24 The significance of the noise impacts of the Proposed Development during operation will be assessed using the method outlined in BS 4142 and World Health Organisation (WHO) guidance (WHO, 2009). BS4142 provides a method for rating the acceptability of increases in existing noise levels at noise-sensitive receptors affected by noise from industrial sources at proposed developments, and the WHO guidance provides information regarding assessment of sleep disturbance. Further details of the approach will be discussed and agreed as required with RCBC and STBC.

6.5.25 Additionally, the tonal, impulsive and irregular characteristics of the noise emissions from the Production Facility will be considered and assessed against the prevailing noise climate to the NSRs.

6.5.26 As outlined in Section 6.9: Traffic and Transportation, the Proposed Development is unlikely to have a significant impact upon traffic flows on local roads around the Proposed Development Site during operation. Therefore, it is proposed to scope this out of the assessment of noise and vibration.

6.5.27 Development design and impact avoidance measures will be used to inform the assessment of likely significant effects. These measures have not been fully defined for the Proposed Development. However, for noise this is likely to include standard best practices approaches such as avoidance of working in the more sensitive evening and night-times where possible. All measures will be outlined with the CEMP.

6.5.28 Any likely remaining significant adverse effects will be mitigated where possible through further mitigation. Following the implementation of mitigation any residual effects on residential and ecological receptors will be identified.

6.5.29 The scope of assessment set out above would be applied whether Main Site A or B (and their associated corridors) are taken forward to the final development design.

6.6 Ecology and Nature Conservation (Including Aquatic Ecology)

Baseline Conditions

6.6.1 The baseline for Ecology and Nature Conservation is considered against the 'Zone of Influence' (ZoI) for the Proposed Development which is the area over which ecology and nature conservation features may be affected by biophysical changes because of the Proposed Development and associated activities (Chartered Institute of Ecology and Environmental (CIEEM), 2022). This approach will be the same regardless of which Main Site (A or B) is selected. Therefore, the Study Area for baseline data gathering has been defined on a precautionary basis to obtain sufficient data to determine the ZoI for the purpose of the ecological impact assessment (EcIA) for either scenario. The approach taken is described below.

6.6.2 A 15 km Study Area around the Proposed Development Site has been applied to identify European Sites, SSSIs and NNRs that need to be considered in terms of the potential for impacts and effects (including for purposes of Habitats Regulations Assessment (HRA)), particularly those with mobile species such as birds[3] or marine mammals[4]. The assessment will initially consider features within a potential ZoI of up to 15 km based upon guidance for air quality impact assessment during operation as outlined in Section 6.2: Air Quality of this report.

[3] Note as ornithology will be a separate stand-alone chapter, further information on the baseline and scope of assessment of specific relevance to ornithology is outlined separately in Section 6.7 of this EIA Scoping Report.
[4] Note as marine ecology will be a separate stand-alone chapter further information on the baseline and scope of assessment of specific relevance to marine ecology is outlined separately in Section 6.8 of this EIA Scoping Report.

6.6.3 The Study Area for the identification of local statutory and non-statutory nature conservation sites, and for gathering third party records of habitats and protected and notable species is a more focussed area of 2 km around the Proposed Development Site. This distance is again informed by standard guidance for air quality impact assessment and other good practice (CIEEM, 2017 & 2022). The potential ZoI for the Proposed Development will be refined further later for the purposes of the final EcIA.

6.6.4 The desk study areas are summarised in Table 6-2.

6.6.5 The field survey area will include all land within the extent of the Proposed Development Site (subject to access) plus at least a 50 m buffer to place the Proposed Development Site in its wider habitat context, and to appraise habitat suitability for those protected species that are potentially sensitive to indirect impact sources (e.g. noise or visual disturbance). The species-specific survey areas to be observed are detailed later in this section, in Table 6-2: Summary of Ecological Surveys and Data Collection (Including Ornithology and Aquatic Ecology).

Table 6-2 Sources of Desk Study Data[5]

DATA SOURCE	SEARCH AREA	ACCESSED / DATA RECEIVED	DATA OBTAINED
Environmental Records Information Centre (ERIC) North East	2 km	August 2022	Species records, non-statutory sites, and the associated interest features/reasons for designation.
Industry Nature Conservation Association (INCA)	Data specific	23 March 2022	Species records, roost and breeding site locations for birds and protected and notable species.
Multi Agency Geographic Information for the Countryside (MAGIC) (Defra, 2022)	Up to 15 km	November 2022	15 km for European Sites, SSSIs and NNRs. 2 km for all other features (local statutory designations, ancient woodland, European Protected Species records, priority habitats).
Joint Nature Conservation Committee (JNCC) website (JNCC, 2022)	Up to 15 km	November 2022	Reasons for designation and other information on European and Ramsar sites.

[5] Sources of Desk Study Data of specific relevance to ornithology are outlined separately in Section 6.7, however it is noted that there will be some overlap in the use of certain sources of data across all of the ecology chapters.

DATA SOURCE	SEARCH AREA	ACCESSED / DATA RECEIVED	DATA OBTAINED
Natural England Designated Sites View website (Natural England, 2022b)	Up to 15 km	November 2022	Reasons for designation and other information on statutory designated sites.
Net Zero Teesside DCO, available on the Planning Inspectorate Website (AECOM, 2021)	Data Specific	November 2022	Habitat and species data.
Environment Agency Ecology and Fish Data explorer (EA, 2022d)	2 km	November 2022	Detailed count data for fish, records of aquatic macroinvertebrates, invasive species and aquatic plants.
National Biodiversity Network (NBN) Atlas explorer website (NBN Atlas, 2022)	2 km	November 2022	Species data

Statutory Designated Sites

6.6.6 As illustrated on Figure 13: Statutory Designated Sites within 15 km of the Proposed Development Site Boundary (Appendix A) there are the following European Sites, SSSIs and NNRs:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, part of which falls within the Proposed Development Site;
  - North York Moors SPA, located approximately 7.9 km south-east of the Proposed Development Site; and
  - Northumbria Coast SPA, located approximately 10.4 km north-west of the Proposed Development Site.
- Three SACs:
  - North York Moors SAC, located approximately 7.9 km south-east of the Proposed Development Site;
  - Durham Coast SAC, located approximately 10.4 km north-west of the Proposed Development Site; and

  - Castle Eden Dene SAC, located approximately 13.5 km north-west of the Proposed Development Site.

- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar site, part of which falls within the Proposed Development Site; and
  - Northumbria Coast Ramsar site, located approximately 10.5 km north-west of the Proposed Development Site.
- 20 SSSIs:
  - Teesmouth and Cleveland Coast SSSI, some of which is located within the Proposed Development Site;
  - Lovell Hill Pools SSSI, located approximately 2.4 km south-east of the Proposed Development Site;
  - Briarcroft pasture SSSI, located approximately 7.7 km west of the Proposed Development Site;
  - Roseberry Topping SSSI, located approximately 8 km south of the Proposed Development Site;
  - North York Moors SSSI, located approximately 8 km south-east of the Proposed Development Site;
  - Saltburn Gill SSSI, located approximately 8.2 km south-east of the Proposed Development Site;
  - Whitton Bridge Pasture SSSI, located approximately 8.3 km west of the Proposed Development Site;
  - Langbaurgh Ridge, located approximately 8.4 km south of the Proposed Development Site;
  - Cliff Ridge SSSI, located approximately 9 km south of the Proposed Development Site;
  - Durham Coast SSSI, located approximately 9.1 km north of the Proposed Development Site;
  - Hart Bog SSSI, located approximately 9.5 km north of the Proposed Development Site;
  - Pike Whin Bog SSSI, located approximately 10.4 km north-west of the Proposed Development Site;

- Kildale Hall SSSI, located approximately 11.6 km south of the Proposed Development Site;
- Hulam Fen SSSI, located approximately 12 km north of the Proposed Development Site;
- Castle Eden Dene SSSI, located 13.5 km north of the Proposed Development Site;
- Pinkney and Gerrick Woods SSSI, located approximately 13.6 km south-east of the Proposed Development Site;
- Fishburn Grassland SSSI, located approximately 13.8 km north-west of the Proposed Development Site;
- Charity Land SSSI, located approximately 13.9 km north-west of the Proposed Development Site;
- Newton Ketton Meadow SSSI, located approximately 14.6 km west of the Proposed Development Site; and
- Boulby Quarries SSSI, located approximately 14.9 km south-east of the Proposed Development Site.

- Three NNRs:
  - Teesmouth NNR, some of which is located within the Proposed Development Site;
  - Durham Coast NNR, located approximately 9.5 km north-west of the Proposed Development Site; and
  - Castle Dene NNR, located approximately 13.5 km north-west of the Proposed Development Site.

6.6.7 There are five LNRs within 2 km of the Proposed Development Site, namely:

- Cowpen Bewley Woodland Country Park LNR, part of which is located within the Proposed Development Site;
- Charlton's Pond LNR, located approximately 0.5 km west of the Proposed Development Site;
- Seaton Dunes and Common LNR, located approximately 1.3 km north-east of the Proposed Development Site;
- Billingham Beck Valley LNR, located approximately 1.4 km west of the Proposed Development Site; and

- Greatham Beck LNR, located approximately 1.8 km north-west of the Proposed Development Site.

Non-Statutory Designated Sites

6.6.8 There are 22 Local Wildlife Sites (LWS') within 2 km of the Proposed Development Site:

- Eston Pumping Station LWS and Greatham Creek North Bank Saltmarsh LWS, which are wholly located within the Proposed Development Site;
- Coatham Marsh LWS, Cowpen Bewley Woodland Park LWS, Greenabella Marsh LWS, Philips Tank Farm Grassland LWS and Saltern Saltmarsh LWS, which are partially located within the Proposed Development Site;
- Queens Meadow Wetland LWS, located approximately 0.2 km north of the Proposed Development Site;
- Tot Fenny's Meadow LWS, located approximately 0.4 km west of the Proposed Development Site;
- Billingham Norton Bottoms Reedbed Treatment System LWS, located approximately 0.7 km south of the Proposed Development Site;
- Brenda Road Sewage Works Grassland LWS, located approximately 0.7 km north of the Proposed Development Site;
- Norton Bottoms LWS, located approximately 0.8 km west of the Proposed Development Site;
- Brenda Road Brownfield LWS, located approximately 0.8 km north of the Proposed Development Site;
- Power Station Grassland and Wetland LWS, located approximately 0.9 km north of the Proposed Development Site;
- Teessaurus Park LWS, located approximately 0.9 km east of the Proposed Development Site;
- Seaton Common LWS, located approximately 1.1 km north of the Proposed Development Site;
- Wilton Woods Complex LWS, located approximately 1.2 km south of the Proposed Development Site;
- Portrack Meadows LWS, located approximately 1.3 km south of the Proposed Development Site;
- Zinc Works Bird Field LWS, located approximately 1.3 km north of the Proposed Development Site;
- Billingham Beck Valley Country Park LWS, located approximately 1.4 km west of the Proposed Development Site;

- Greatham Beck LWS, located approximately 1.6 km north-west of the Proposed Development Site; and
- Portrack Marsh LWS, located approximately 1.7 km south of the Proposed Development Site.

6.6.9 As part of the ecological desk study, the presence of all relevant non-statutory designated sites will be determined and the details will be provided with the PEI Report.

6.6.10 Other ecologically sensitive habitat sites such as RSPB reserves will also be identified through the ecological desk study and assessed within the EcIA.

Habitats

6.6.11 There are desk study records of the following known or potential terrestrial and freshwater Habitats of Principal Importance (HoPIs) within the Proposed Development Site:

- open mosaic habitat on previously developed land;
- coastal sand dunes;
- mudflats;
- coastal and floodplain grazing marsh;
- coastal saltmarsh;
- saline lagoons;
- ponds; and
- deciduous woodland.

6.6.12 The habitats present within the Proposed Development Site, including any HoPI, will be confirmed through the Phase 1 Habitat Survey. This survey will be undertaken with reference to the standard methodology (JNCC, 2010). The Phase 1 habitat survey results will be aligned with the modified UK Habitat (UKHab) Classification used for the purposes of Biodiversity Net Gain (BNG) site condition assessment with reference to the current iteration of the standard methodology (currently this is Biodiversity Metric 3.1 (Natural England, 2021)).

6.6.13 Habitat surveys will be completed for locations where permanent infrastructure may be constructed as part of the Proposed Development, along the proposed connection corridors, and temporary construction laydown areas. Data will also be collected for a 50 m buffer around the Proposed Development Site. The scope of the planned habitat surveys is set out in Table 6-3: Summary of Ecological Surveys and Data Collection (Including Ornithology and Aquatic Ecology).

Protected and Notable Species

6.6.14 It is anticipated that some habitats within the ZoI of the Proposed Development Site will have suitability to support protected and notable species including bats, badger *Meles*, otter *Lutra lutra*, water vole, reptiles *Arvicola amphibius*, great crested newt

Triturus cristatus, fish, aquatic macroinvertebrates and plants. While some desk study data is available for species, the coverage is partial and often there is a lack of precision on whether these species occur in relation to the Proposed Development Site. To address this a suite of species surveys will be completed as outlined in Table 6-3: Summary of Ecological Surveys and Data Collection (including Ornithology and Aquatic Ecology).

6.6.15 Great crested newt is scoped out as a protected species constraint for all parts of the Proposed Development Site located to the south of the River Tees. This approach has been informed by prior advice received in relation to the NZT project (as detailed in AECOM, 2021). For that project, the Industry Nature Conservation Association (INCA) advised that there are no known occurrences of great crested newt in the South Tees area of Redcar and Cleveland and that it is well established that great crested newt surveys are not required to support planning applications in the South Tees area. This species is to be considered further in relation to the parts of the Proposed Development Site located to the north of the River Tees.

6.6.16 The scope of the planned (and ongoing) ecology surveys is set out in Table 6-3. The survey methodologies will follow Natural England standing advice, CIEEM best practice guidance and industry guidance for protected species survey.

Invasive Non-Native Species (INNS)

6.6.17 Checks will be made for INNS during the habitat surveys and during the aquatic ecology surveys and will be listed in the subsequent reports for consideration in the EcIA.

Scope of the Assessment

6.6.18 The following potential impacts and their resulting effects on ecology and nature conservation features will be considered within the EcIA for the Proposed Development:

- temporary disturbance impacts and permanent loss and degradation of nature conservation designations and other relevant terrestrial habitats (including Functionally Linked Land) within the Proposed Development Site during construction, and within the wider ZoI where potential pathways for impact extend beyond the Proposed Development Site;
- direct and indirect impacts on relevant protected and notable species, e.g. as a result of injury, temporary or permanent lighting, habitat loss or noise and visual disturbance, during construction and operation;
- temporary water quality (sediment run-off, other possible emissions to water) and air quality impacts (dust emissions, emissions from construction traffic movements) on relevant habitats and species during construction; and
- long-term air quality impacts on nature conservation designations in the vicinity of, or downwind of, the Proposed Development Site during operation.

Table 6-3: Summary of Ecological Surveys and Data Collection (Including Ornithology and Aquatic Ecology)

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
Phase 1 habitat survey and Habitat Condition Assessment to inform Biodiversity Net Gain (BNG) Assessment.	A Phase 1 Habitat Survey will be conducted in accordance with the published method (JNCC, 2010). It will be supplemented by a BNG site condition assessment to meet data needs for subsequent BNG assessment. An assessment of habitat suitability for protected and notable species will also be made to inform the iterative scoping of detailed protected and notable species surveys. Record of Invasive Non-Native Species (INNS) of plants and incidental records of protected or priority species or their field signs will be made. The surveys will be supplemented by aerial habitat mapping. The information will confirm the ecological baseline and form the basis of the calculation of potential permanent and temporary habitat effects within the EcIA and for purposes of the BNG assessment.	Optimal time – April to October but can be carried out at any time of year.	Accessible terrestrial habitats within the Proposed Development Site.
Non-breeding birds within the scoping boundary and functionally linked land	Monthly wintering and passage surveys of terrestrial habitats and wetland (including intertidal and non-tidal) up to 1 km from the pipeline routes will be undertaken, using a variant of the Wetland	Between October 2022 and March 2023, and August – October 2023.[7]	Intertidal; tidal saltmarsh; other tidal and non – tidal wetland habitats; and terrestrial habitats up to a maximum of

[7] Initial engagement with Natural England on 14th February 2022 confirmed that a full season of wintering bird survey data would be required. Given the presence of qualifying features of the Teesmouth and Cleveland Coast Ramsar, SPA and SSSI all year round, agreement was reached that 12 months of survey data would be appropriate, supplemented where necessary by the available third party data available from multiple sources including (but not necessarily limited to) Natural England, the Environment Agency, INCA, ERIC Northeast and baseline data supporting other planning applications and DCOs within the Study Area.

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
	Birds Survey (WeBS)[6] method, supplemented with a 'look-see' or field count method. These will be carried out each month at low and high tides. Third party data from online sources and data providers will be used to supplement the baseline survey data. Includes all habitats that may be subject to permanent or temporary habitat losses and disturbance during construction and operation of the Proposed Development and for which sufficient data to inform impact assessment cannot be obtained from third parties.		approximately 1km[8] from the Proposed Development Site boundary.
Breeding birds within the Proposed Development Site and in functionally linked land	Monthly surveys using the above methodology would be completed. Spring passage birds will also be recorded during these surveys. Breeding bird surveys will be carried out within terrestrial habitats likely to support assemblages of breeding birds, using an appropriate methodology[9], at locations of permanent habitat loss and/or significant disturbance (such as locations of permanent above ground infrastructure and working areas where habitats capable of	Between March 2023 and July 2023.	As above for non-breeding birds. Survey areas for breeding terrestrial birds, if required, will be determined in more

[6] The Wetland Bird Survey (WeBS) is the long-term monitoring scheme for non-breeding waterbirds in the UK, which aims to provide the principal data for the conservation of their populations and wetland habitats. WeBS is a partnership between the British Trust for Ornithology, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee (the last on behalf of Natural England, Natural Resources Wales, Scottish Natural Heritage and the Department of the Environment Northern Ireland) in association with the Wildfowl and Wetlands Trust. Core counts are synchronised monthly counts undertaken at wetlands throughout the UK. The surveys generate counts of water birds within pre-defined count sectors. Survey methods are available at BTO (n.d.)

[8] Plus some areas of permanently submerged offshore habitat adjacent to Coatham Sands and Bran Sands further than 1 km from the Proposed Development Site.

[9] Such as the Common Birds Census (Marchant, 1983).

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
	supporting breeding birds may be affected for extended periods of time).		detail as the Proposed Development design progresses.
Great crested newt – District Level licensing (DLL) and / or habitat suitability assessments.	In relation to the area of the Proposed Development Site to the north of the River Tees it is proposed to consult Natural England to confirm whether a DLL approach will be available for this project. If not, a desk-based exercise will be undertaken to map and categorise all waterbodies within 250m of the Proposed Development. Habitat Suitability Index (HSI) assessments of ponds in accordance with Oldham *et al.* (2000) will be undertaken. Data collected by the desk study and online information where this may be available (i.e. European protected species mitigation licence information and Natural England Open data sources, will also be reviewed).	Consultation with Natural England can be undertaken at any time. HSI assessments are proposed to be undertaken in combination with Phase 1 Habitat Survey where land parcels coincide.	All suitable waterbodies within 250m of proposed connection corridors.
Great crested newt presence / likely absence survey and population assessment surveys	In relation to the area of the Proposed Development Site to the north of the River Tees (proposed connection corridors). Where possible, environmental DNA (eDNA) surveys will be undertaken in accordance with the protocols as set out by Biggs *et al*. (2014). Where eDNA survey may not be practicable at specific waterbodies (e.g. water too shallow for sampling) consideration of the need to undertake traditional presence/absence survey techniques will be made. Where necessary standard presence/absence surveys utilising four visits will be undertaken in accordance with the standard survey methodology (English Nature, 2001). Population size class assessment surveys will be completed where this species is confirmed present (six survey visits of waterbodies with positive eDNA result or known to support this species based on desk-based data) in accordance with standard guidance (English Nature, 2001; Natural England, 2022a).	eDNA: 15th April to 30th June 2023. Traditional presence/ absence surveys: Mid-March to mid-June 2023. These surveys may need to be commenced prior to receipt of eDNA survey results being received in order to achieve required timings.	Suitable waterbodies within 250 m of the Proposed Development Site north of the Tees. The locations of ponds requiring survey will be informed by the outcome of the HSI and eDNA.

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
Bats - Preliminary Roost Features (PRF) assessment	Permanent impacts on trees will be avoided where possible. Trees to be directly impacted will be subject to a PRF assessment survey in accordance with The Bat Conservation Trust (BCT) guidance (Collins *et al*., 2016). Should a structure or building be impacted this will also be subject to PRF assessment in accordance with BCT Guidance (Collins *et al.*, 2016). Information collated on the location of trees that are suitable for roosting bats will inform design and offset buffers to avoid direct effects upon potential roost sites. Furthermore, the PRF assessment information will form the basis of the scope for roost surveys (as detailed below).	Any time of year.	The Phase 1 habitat survey will inform the extent of areas requiring PRF assessment.
Bats – Foraging / Commuting	Habitats will be appraised for their suitability to support foraging and commuting bats during the extended Phase 1 habitat survey. Activity surveys will be undertaken with reference to published guidance (Collins *et al.*, 2016) only where permanent effects upon suitable habitats are predicted. It is not considered necessary to undertake detailed bat activity surveys along the connection routes given the temporary nature of habitat loss, and the avoidance of the removal of mature trees or other structures which may support roosting bats. Where linear habitat features (e.g. watercourses/hedgerows) are affected by the Proposed Development, but which may provide commuting routes or a foraging resource for bats, appropriate robust and precedented mitigation measures can be secured via adoption of construction methods that seek to avoid these features and reduce the temporary effects to a level that would not be significant. Therefore, surveys are not considered necessary.	If required: April/May to September 2022 inclusive.	Limited to areas of suitable habitat which will be permanently lost to facilitate the Proposed Development.
Bats – roosting	It is likely that the Proposed Development will be able to avoid trees with PRFs that have potential to support a bat roost. However, where this is not possible, trees will be subject to climbing and assessment of	Any time of year. If required, between	Features with bat roost suitability identified

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
	the identified PRF features where safe to do so, to confirm if the tree could be used as a roost and/ or if there are signs of bats. Where tree climbing confirms that the PRF does have potential to support a roost and/or where it is not possible to safely climb a tree, bat emergence/re-entry surveys will be undertaken at dusk and dawn in accordance with standard survey guidance (Collins *et al.*, 2016; Bat Conservation Trust 2022). To determine appropriate mitigation, and EPSM licensing requirements, if necessary, where trees with confirmed/potential bat roosts cannot be entirely avoided.	April/May and September 2023.	during the Phase 1 Habitat Survey.
Badger	A presence/absence survey for setts and field signs will be conducted in combination with the Phase 1 habitat survey. The survey will focus on habitat suitable to support setts. Incidental records obtained through desk study data in combination with the completion of other surveys will also supplement the baseline assessment.	Any time of year – and will be combined with the Phase 1 Habitat Survey.	The Proposed Development Site plus a 50 m buffer.
Otter and Water Vole	Presence/absence surveys based on Dean *et al.* (2016) and Chanin (2003) will be conducted to , looking for field signs along watercourses and ditches where open cut crossing techniques will be required, will be conducted. A spring survey will be completed, with a second survey as required to confirm presence/ likely absence.	Otter surveys can be completed at any time. Water Vole – spring survey before end of June 2023; and if required a second survey before end September 2023.	Up to 500 m length of the watercourse – 250 m up and down stream of crossing point.
Reptiles	A desk-based habitat assessment (using aerial mapping and data sources for reptile records/mapping for the area/county) will be undertaken to highlight potential areas of interest for reptiles within the Proposed Development Site. These areas will then be subject to assessment for their potential to support reptiles as part of the Phase 1 Habitat Survey based on technical guidance by ARC Trust (Sewell *et al.*, 2013).	If required: Optimal – April to middle of June and September. However, surveys will be carried out between April and September inclusive	Only likely required at potential permanent infrastructure locations – subject to the findings of the Phase 1 Habitat Survey.

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
	Where habitats appear suitable for reptile populations and are to be permanently affected by the Proposed Development, presence/absence surveys will be undertaken following guidance provided by in Froglife Advice Sheet 10: Reptile Surveys (Froglife, 1999). Survey involves laying refugia (carpet tiles/roof felts) and leaving them in situ for 1-3 months. They will be checked 7 times and then removed after the last survey. Presence/absence reptile surveys will only be considered warranted where areas of moderate/ high value reptile habitat cannot be avoided by the Proposed Development. These data will inform the EcIA and mitigation strategy. Temporary construction effects upon small areas of suitable reptile habitat will be able to be mitigated through appropriate pre-construction measures (e.g. supervised vegetation clearance at an appropriate time of year).	depending on the weather.	
Freshwater species (Aquatic Ecology)	The scope and requirements for specific surveys will be informed by an aquatic scoping survey, and would consider requirements for surveys of ditches, watercourses, and ponds within the Proposed Development Site. The initial scoping surveys will identify where further surveys are required for fish, aquatic macroinvertebrates, aquatic plants, and pond Predictive System of Multimetrics (PSYM), including INNS.	Macroinvertebrates: Spring (April – May 2023) and Autumn (November 2022); Macrophytes: June – September 2023; Pond PSYM: Summer (June – August 2023).	Waterbodies within the Proposed Development Site that are likely to be impacted.
Terrestrial Invertebrates	The scope of survey will depend upon the habitat type and target invertebrate species. Requirements for invertebrate surveys will be reviewed as part of the desk study/extended Phase 1 Habitat survey scope.	If required, surveys will be completed between April and September.	Subject to findings of the Phase 1 Habitat Survey and value of habitats to terrestrial invertebrates – focused on areas of permanent habitat loss.

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
Plants	Surveys for protected and notable plants would be undertaken if appropriate based on the findings of the habitat surveys. Any specific relevant occurrences of notable plants identified by the desk study would also be targeted for survey. Pond plants will be identified as part of the pond PSYM method which requires the identification of aquatic plants and macroinvertebrates. Aquatic plant INNS will also be assessed.	Summer 2023 (June-August 2023).	Relevant habitats as identified by the Phase 1 Habitat survey. Locations indicated by the desk study results. Accessible ponds within the Proposed Development Site that are likely to be impacted.

6.6.19 Considering the above, an assessment of terrestrial and freshwater ecology and nature conservation is scoped into the future impact assessment.

6.6.20 The EcIA will be undertaken in accordance with good practice guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2022). It will not be necessary in the assessment to address all ecological features with potential to occur, and instead the focus should be on those that are 'relevant'.

6.6.21 CIEEM (2022) makes clear that there is no need to "*carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable*". This does not mean that efforts would not be made to safeguard wider biodiversity, and requirements in support of this would be considered. National policy documents emphasise the need to achieve no net loss of biodiversity and enhancement of biodiversity.

6.6.22 The results of the ecological desk study, the habitat and species surveys, and the outcomes of any consultation responses will be used to inform the relevant ecological features to be addressed in the EcIA.

6.6.23 To support focussed EcIA there is a need to determine the scale at which the relevant ecological features are of value. Consistent with good practice (CIEEM, 2022), the value of each relevant ecological feature will be defined with reference to the geographical level at which it matters. The frames of reference used for this assessment are therefore:

- International (typically this is within a European context, reflecting the general availability of good data to allow cross-comparison);
- National (Great Britain, but considering the potential for certain features to be more notable (of higher value) in an England context relative to Great Britain as a whole);
- Regional (North-East England);
- County (Tees Valley);
- District (Redcar and Cleveland, Stockton-on-Tees and Hartlepool);
- Local (features that do not meet criteria for valuation at a District or higher level, but that have sufficient value at the site level to merit retention or mitigation); and
- Negligible (common and widespread features that have very low value at the level of the Proposed Development Site, and which do not require retention or mitigation at the relevant location to otherwise maintain a favourable nature conservation status, or to deliver wider relevant biodiversity objectives and can be screened out).

6.6.24 Design and impact avoidance measures will be used to inform the assessment of likely significant effects. These measures will be defined later in the EIA process but would include consideration of options to minimise impacts to relevant terrestrial and freshwater ecology features or otherwise to achieve legislative compliance (e.g. in relation to dust management or water quality). Measures during construction,

including best practice, will be included and implemented through the CEMP or permitting regimes.

6.6.25 Any remaining significant adverse effects will be mitigated or compensated for, and ecological enhancements may be recommended where appropriate. Following the implementation of mitigation and compensation, any residual effects on relevant ecological features will be identified.

6.6.26 The scope of assessment set out above would be applied whether Main Site A or B (and their associated corridors) are taken forward to the final development design. The specific survey requirements relevant to the Main Sites may differ slightly, but overall, the approach to the assessment for both sites would be the same.

Habitats Regulations Assessment

6.6.27 A HRA will be undertaken to assess whether the Proposed Development is likely to have a significant effect on European Sites. The need to undertake HRA is implemented in English and Welsh law by the Conservation of Habitats and Species Regulations 2017 (as amended).

6.6.28 Stage 1 of the HRA process (Test of Likely Significant Effects) will consider the potential pathways of effect between the Proposed Development and European Sites within 15 km of the Proposed Development Site (on the basis that it is unlikely that a project such as this will affect sites further afield), and whether there is potential to have a significant adverse effect on the integrity of the European Sites, either alone or in combination with other plans or projects. Information used to support the HRA process will include desk study data and the results of relevant species surveys outlined in Table 6-3 (as well as the surveys identified below in Section 6.7: Ornithology and Section 6.8: Marine Ecology).

6.6.29 Where there is potential for the Proposed Development to have a significant effect upon the qualifying features of European Sites, the pathway will be taken forward to Stage 2 – Appropriate Assessment. At Appropriate Assessment, the measures that will be implemented to either avoid the impact in the first place, or to mitigate the ecological effect to such an extent that it is no longer significant, will be set out.

6.6.30 The HRA will be prepared in line with Planning Inspectorate (2022) Advice Note 10 (Habitats Regulations Assessment) including completion of the necessary matrices. The HRA process will be in line with the EIA process. There would be a 'Test of Likely Significant Effects Report' at the PEI Report stage, and this will be updated as necessary for the Application including a report to inform Appropriate Assessment, if required.

6.6.31 The scope of the report to inform the HRA will be determined through consultation with Natural England and other key stakeholders. It is recognised that HRA is a multi-stage process and, therefore, the Applicant will continue to consult with Natural England as the HRA progresses.

Biodiversity Net Gain Assessment

6.6.32 Schedule 15 of the Environment Act 2021 makes provision for BNG in relation to development consent for NSIPs. The requirement for BNG for NSIPs will not become mandatory until 2025, however this project will aspire to achieve a net gain in

biodiversity. A BNG assessment will be undertaken for the Proposed Development in accordance with the published Natural England (currently this is Biodiversity Metric 3.1 (Natural England, 2022c)).

6.7 Ornithology

Baseline Conditions

Statutory and Non- Statutory Designated Sites

6.7.1 The statutory and non-statutory designated sites relevant to ornithology are summarised in Section 6.6: Ecology and Nature Conservation and are not repeated here.

Species

6.7.2 Preliminary baseline data gathering was carried out to inform the initial design phase of the Proposed Development, between August 2021 and March 2022, by means of a desk study and a limited suite of non-breeding wetland bird surveys.

6.7.3 Sources of desk study information are summarised in

6.7.4 Table 6-4.

Table 6-4: Sources of Desk Study Data Relevant to Ornithology[10]

DATA SOURCE[11]	SEARCH AREA[12]	ACCESSED/DATA RECEIVED	DATA OBTAINED
Environmental Records Information Centre (ERIC) North East	Up to 2 km	11th August 2021	Bird records
Industry Nature Conservation Association (INCA)	Data specific	23rd March 2022	Bird records, roost and breeding site locations for several species.

[10] As outlined in Section 6.6: Ecology and Nature Conservation (Table 6-2) there will be some overlap in the use of certain sources of data across all of the ecology chapters so not all are repeated here again.
[11] Further data will be requested, as required, to address the current extent of the Proposed Development, as stated in paragraph 6.1.213
[12] Search areas are expressed as a radius from the collective boundaries of the preliminary Proposed Development area identified in January 2022 which was larger than the Proposed Development Site. WeBS data are typically requested for a minimum of 500 m from the Proposed Development, however this distance is adjusted where appropriate to account for continuity and connectivity of habitats, the spatial context of WeBS count sectors in relation to the Proposed Development, consistency and/or age of count data and the Zone of Influence of potential impacts of the proposed Development.

DATA SOURCE[11]	SEARCH AREA[12]	ACCESSED/DATA RECEIVED	DATA OBTAINED
British Trust for Ornithology Wetland Birds Survey (WeBS) (BTO, 2022)	Data specific	10th May 2022	Detailed count data for wetland birds occurring within selected wetland habitat count areas across Teesside.

6.7.5 Wetland bird counts were completed between January and March 2022 (inclusive), within the broad areas summarised in Table 6-5.

Table 6-5: Summary of Ornithology Surveys Completed to Date

SURVEY AREA	JANUARY 2022	FEBRUARY 2022	MARCH 2022
The Foundry (Main Site) and adjacent coastal/wetland habitats	1 High Tide 1 Low Tide	2 High Tide 2 Low Tide	2 High Tide 2 Low Tide
Seal Sands Bay and adjacent coastal/wetland habitats	No surveys	2 High Tide 2 Low Tide	2 High Tide 2 Low Tide

6.7.6 The entirety of the Teesside coast can be considered to support significant populations of non-breeding birds and populations of some breeding water birds for which the Teesmouth and Cleveland Coast SPA, Ramsar and SSSI are designated. Furthermore, the baseline data gathered to date have identified some locations or broad areas in proximity to the Proposed Development Site that are very sensitive due to the reliance of birds on them during either during potentially adverse tide and/or weather conditions, or on a regular basis irrespective of the conditions.

6.7.7 Within the Foundry survey area these include:

- Dabholm Gut, which supports large numbers of feeding waders and ducks;
- Bran Sands Lagoon, which supports roost a range of roosting and feeding waders, ducks and gulls;
- Bran Sands Bay, which regularly supports feeding waders and other water birds, and includes several regularly used roosts; and
- the northern edge of Coatham Dunes and the wider coastline of Coatham Sands, which provides feeding and roosting habitat for several species of wader, terns and a wide range of other water birds.

6.7.8 Within the Seal Sands survey area these include:

- the entirety of Seal Sands Bay and its periphery, including the sea wall and the promontory/spit of land at its eastern extent and some of the grasslands immediately to the south of the bay, which are used predominantly by roosting and feeding waders;

- Greenabella Marsh, to the west of the bay, the pools within which are used by several species of feeding and roosting waterbirds, and by several species of breeding water bird; and
- the pools and grasslands immediately south-west of the bay, which support feeding and roosting waders.

6.7.9 West of Seal Sands, the area collectively known as the North Tees Marshes, which includes Greatham Creek channel and the adjacent expanses of saltmarsh, supports large numbers of feeding and roosting waders, ducks, geese and other water birds, plus colonies of breeding waders and terns.

6.7.10 The baseline data gathered to date suggest that neither of the main sites being considered support more than small numbers of coastal and wetland birds, however some differences between the two sites can be determined at this stage. Main Site A supports very little semi-natural habitat and is within an area subject to ongoing industrial workings, building demolition, vehicle movements and continuous disturbance from human activity. The only species recorded in this area during wetland bird counts have been small numbers of gulls, mostly within the northern half of the site during high tide surveys. Herring gull (*Larus argentatus*) and black-headed gull are qualifying assemblage species of Teesmouth and Cleveland Coast SPA in winter.

6.7.11 Main Site B supports worked areas and infrastructure in its southern half and, along it's northern edge, semi-natural habitats including grassland, a small pond with reedbed, scattered scrub and open mosaic habitat immediately adjacent to the mouth of the River Tees and Seal Sands Bay. Wetland bird counts to date have detected larger (albeit still small) numbers of birds in these areas, including occasional gull roosts and the presence of feeding and roosting waders including curlew (*Numenius arquata*) and oystercatcher (*Haematopus ostralegus*) in small numbers. Larger numbers of water birds, predominantly waders and ducks for which Teesmouth and Cleveland Coast Ramsar, SPA and SSSI are designated, were recorded within adjacent intertidal habitats.

6.7.12 However, overall the baseline conditions as outlined above apply and are relevant to both Main Site A and Main Site B.

Scope of the Assessment

6.7.13 The Proposed Development Site is located predominantly onshore (i.e., within terrestrial habitats). However, some elements of the Proposed Development are proposed beneath, through or within estuarine and wetland habitats including intertidal habitat, tidal saltmarshes and land-locked non-tidal wetlands, plus adjacent terrestrial non-wetland habitats that may support foraging or roosting water birds.

6.7.14 Further baseline data will be gathered as per the methods and within the areas summarised in Table 6-3 to 6-4, including further surveys as outlined. This includes all of the habitats surveyed previously, plus a wider area that includes more habitat

to the north-west, west and south of the Proposed Development Site, including the North Tees Marshes.

6.7.15 The ornithology chapter will assess the potential impacts and effects on relevant bird designations and bird species (hereafter 'relevant bird features') as a result of the Proposed Development. The methodology will be the same as that described in Section 6.6: Ecology and Nature Conservation.

The potential impacts of the Proposed Development on relevant bird features will include those arising from construction and operation. The following potential impacts and effects will be considered in the ornithology chapter:

- the effects on birds resulting from temporary impacts to and degradation of habitats within the Proposed Development Site during construction, including impacts from sediment run-off to surface waters;
- temporary disturbance of birds, principally through noise, visual, and dust emissions from construction traffic and other construction related activities;
- permanent losses or degradation of habitats used by nesting, roosting, and feeding birds during construction of new infrastructure;
- disturbance of habitats and protected species (including noise and light impacts) in the vicinity of the Proposed Development during operation; and
- long-term air quality impacts on designated habitats of importance for relevant birds in the vicinity of the Proposed Development Site during operation.

6.7.16 These potential impacts on relevant bird features will be assessed in accordance with the current good practice methodology for EcIA described in Section 6.6: Ecology and Nature Conservation.

6.7.17 The results of the ornithological desk study, further bird surveys, and outcomes of any consultation responses will be used to inform the EcIA. The assessment will also be informed by the findings of the other specialist assessments, such as those to be reported in the chapters for Noise, Air Quality, Surface Water, Flood Risk and Water Resources, Terrestrial Ecology and Marine Ecology. The findings of the HRA will also be considered.

6.7.18 Design and impact avoidance measures will be used to inform the assessment of likely significant effects. These measures will be defined later but for ornithology this is likely to include (but is not necessarily limited to) the following measures:

- consideration of routeing of proposed connection corridors to utilise existing above ground and/or underground infrastructure to limit the excavations and construction activities required and therefore habitat losses and disturbance to species and habitats;
- routeing of proposed connection corridors, where these require new infrastructure, to avoid sensitive habitats and areas of regular bird occurrence such that the potential impacts on relevant ornithological receptors are avoided or reduced to levels that are not significant;

- implementing measures to deliver compliance with industry good practice and environmental protection legislation during construction, e.g., prevention of surface and ground water pollution, fugitive dust management, and noise prevention or amelioration. These would be implemented through the CEMP or permitting regimes; and
- planning clearance of habitats suitable for breeding birds during site preparation to be undertaken outside the breeding season (typically March-August inclusive for most species), where possible.

6.7.19 Once design and impact avoidance measures have been taken into consideration any remaining significant adverse effects will be mitigated or compensated for, and ecological enhancements recommended where appropriate. Mitigation and enhancement proposals will consider wider strategic aims and options for mitigation of development in the Teesside / Redcar and Cleveland and Hartlepool areas. Following the implementation of mitigation and compensation, any residual effects on ecological receptors will be identified.

6.7.20 The scope of assessment set out above would be applied whether Main Site A or B (and their respective connection corridors) are taken forward to the final development design.

6.8 Marine Ecology

Baseline Conditions

6.8.1 The Study Area for marine ecology has a particular focus on Greatham Creek, Seaton Channel and Seal Sands as well as the Tees Estuary further downstream. Although no works are proposed within the Tees Bay area, further consideration has been given to the North Sea (including Tees Bay) for receptors with larger extents and / or greater mobility, such as fish and shellfish and marine mammals. A summary of the marine ecology baseline conditions within the Study Area is provided below. Note that the Study Area used is defined as including the likely ZoI where potential significant effects may arise from the Proposed Development. The ZoI, and therefore also the Study Area, is specific to each receptor, recognising both the mobility of each receptor and the likely impact pathways.

Benthic Ecology

6.8.2 The Study Area consists of extensive intertidal and subtidal estuarine soft sediment. Habitat mapping undertaken by the JNCC (2019) and the Environment Agency (2022c) identified Greatham Creek to consist of littoral mud (EU Nature Information System (EUNIS) A2.3), with saltmarsh habitat (EUNIS A2.5) embanking the creek. These habitats were also record at Seal Sands, including patches of littoral sand and muddy sand (EUNIS A5.2) and a small area of eulittoral boulders and stable mixed substrata (EUNIS A1.323). The seabed at Seaton Channel and in the River Tees consisted of estuarine sublittoral mud (EUNIS A5.32). Habitats with higher contents of sand, such as infralittoral fine sand (EUNIS A5.23), infralittoral muddy sand (EUNIS A5.24), and littoral mobile/fine sand shores (EUNIS A2.22 / A2.23) occur at the mouth

of the river and in Tees Bay. Small patches of mussel and subtidal kelp beds have been recorded at South Gare Breakwater, including at the mouth of the estuary.

Fish and Shellfish

6.8.3 The River Tees and Estuary is an important water body for diadromous fish species which make seasonal migrations between the sea and riverine environment. Atlantic salmon (*Salmo salar*), sea trout (*Trutta trutta*), European eel (*Anguilla anguilla*), river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*) are all known to be present and have been identified as Local Priority Species within the Tees Valley Biodiversity Action Plan (BAP), now listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. The River Tees is also considered a main salmon river in England and Wales (Centre for Environment, Fisheries and Aquaculture Science (Cefas) *et al*., 2022). It has been presumed at this stage that these species may also use Greatham Creek, although there are no data to support this (such as on the Environment Agency (2022d) ecology and fish data explorer).

6.8.4 Estuarine and marine fish communities within the lower reaches of the River Tees and coastal waters represent a mixed demersal and pelagic fish assemblage typical of the central North Sea. Species such as sprat (*Sprattus sprattus*), herring (*Clupea harengus*), are plaice (Pleuronectes platessa) are most prevalent, as are lesser sand eel (*Ammodytes tobianus*) in Tees Bay. Fisheries sensitivity maps (Coull et al., 1998; Ellis et al., 2012) indicate that the Study Area is located within the nursery grounds of the following species: herring, sprat, cod (*Gadus morhua*), whiting (*Merlangius merlangus*), plaice, Nephrops sp., lemon sole (*Microstomus kitt*) and spurdog (*Squalus acanthias*). The Proposed Development Site also includes spawning areas of lemon sole and Nephrops. These spawning and nursery grounds are considered to be present mostly in the surrounding coastal areas, although some species may occur in the estuary.

Marine Mammals

6.8.5 The Proposed Development Site is located within the International Council for the Exploration of the Sea (ICES) Greater North Sea Ecoregion, which in part forms the boundaries for the Inter-Agency Marine Mammal Working Group (IAMMWG) marine mammal Management Units (MUs) for the North Sea (ICES, 2021; IAMMWG, 2022). Within this ecoregion, four species of cetacean occur commonly or are resident.

6.8.6 These are: harbour porpoise (*Phocoena phocoena*), bottlenose dolphin (*Tursiops truncatus*), minke whale (*Baleanoptera acutorostrata*) and white-beaked dolphin (Lagenorhynchus albirostris). An additional five species occur regularly in the ecoregion but are less common: short-beaked common dolphin (*Delphinus delphis*), Atlantic white-sided dolphin (*Lagenorhynchus acutus*), long-finned pilot whale (*Globicephala melas*), killer whale (*Orcinus orca*), and Risso's dolphin (*Grampus griseus*). However, it is considered unlikely that these species will occur in the River Tees itself, although harbour porpoise could occur in the surrounding coastal waters, such as in Tees Bay.

6.8.7 The Study Area is an important area for harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*), falling within the North East England seal management unit

(SMU)[13] for both species (Special Committee on Seals (SCOS), 2021). Seal Sands is of particular importance as the intertidal mudflat hosts a breeding colony of harbour seals, supporting 100 – 140 harbour seals during the summer period (Bond, 2019). Harbour seals are also known to haul-out at Bailey Bridge and Greatham Creek. Grey seal are also present at Seal Sands, where up to 40 individuals may be hauled-out in the summer period (Bond, 2019).

Designated Sites

6.8.8 As outlined in Section 6.6: Ecology and Nature Conservation, the Proposed Development Site is situated within close proximity to statutory designated sites for nature conservation including (but not limited to) the Teesmouth and Cleveland Coast SPA, Ramsar site and SSSI, and the Teesmouth NNR.

6.8.9 These sites are designated for the protection of breeding and non-breeding bird species and other important waterfowl species which includes a range of coastal habitats (sandflats and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes) within and around the Tees Estuary, Seal Sands, and Greatham Creek.

6.8.10 The Teesmouth and Cleveland Coast SSSI encompasses a number of previously designated SSSI sites, including the Seal Sands SSSI, which protects the breeding population of harbour seal (*Phoca vitulina*) at this location (as does the Teesmouth NNR).

6.8.11 The Study Area does not overlap with any other European Sites or MCZs designated for marine species and habitats. The Southern North Sea (SNS) SAC, which is designated for harbour porpoise, is located over 100km away from the Proposed Development Site. The SNS SAC has been scoped out from further assessment, as there is considered to be no pathway for effect to this designated site.

Marine Specific Ecological Surveys and Data Collection

6.8.12 Following a review of available data, no project specific marine ecology surveys are proposed.

6.8.13 The presence of harbour and grey seals in the Study Area is well known, including abundances, seasonality, and the known haul-out locations for these species. Therefore, no effort-based surveys for marine mammals have been proposed. However, incidental sightings of seals at Seal Sands and Greatham Creek will be recorded as part of the breeding and non-breeding bird surveys proposed for the Proposed Development and will continue to be observed and recorded. This includes information on the species, their location, abundance, the presence of pups, and if seals are moulting.

[13] The SCOS SMUs have been used in preference to OSPAR Regions, as the SMUs are based on expert knowledge and opinion of seal ecology in the UK, using the most pragmatic approach to management of seals, without inferring discrete populations (SCOS, 2021).

6.8.14 Benthic ecology within the Study Area is well understood, through existing surveys undertaken by the JNCC (2019) and the Environment Agency (2022c), and the subtidal and intertidal benthic surveys completed for the NZT Project in the River Tees and Tees Bay. Open trench construction methodologies in the marine environment are not proposed within the Hydrogen Pipeline Corridor at Greatham Creek. Instead marine crossings will use trenchless technologies or existing pipeline bridges. These methods would result in the avoidance of most impact pathways to benthic habitats and species and would negate the requirement for further surveys. This will continue to be reviewed as the design progresses and following any input or requirements from statutory consultees such as Natural England and the MMO.

6.8.15 Key data sources used for the assessment will include, but not be limited to:

- habitat mapping undertaken by the JNCC (2019) – Marine Nature Conservation Review (MNCR) area summaries and the Environment Agency (2022c) – saltmarsh zonation and extent in England;
- European Marine Observation Data Network (EMODnet, 2021) Seabed Habitats Project for broad-scale habitat maps of the Study Area;
- EUNIS (European Environment Agency, 2012) for classifying benthic habitats;
- Environment Agency (2022d) ecology and fish data explorer, including Transitional and Coastal (TraC) Fish Count data;
- spawning and nursery grounds for UK waters (Coull *et al.,* 1998; Ellis *et al.,* 2012);
- Salmon Stocks and Fisheries in England and Wales (Cefas, 2022);
- Salmonid and fisheries statistics for England and Wales (Environment Agency, 2022e);
- fish landings data for the period 2016-2020 (MMO, 2020);
- ICES publications and data (ICES, 2022);
- shellfish classification zones of England and Wales (Cefas, 2022);
- SCANS (Small Cetacean Abundance in the European Atlantic and North Sea) data (Hammond *et al.,* 2021);
- IAMMWG publications (IAMMWG, 2022);
- Sea Mammal Research Unit (SMRU) (http://www.smru.st-andrews.ac.uk/) and Special Committee on Seals (SCOS) (2021);
- Habitat-based predictions of at-sea distributions for grey and harbour seals in the British Isles (Carter *et al.,* 2020);
- INCA Tees Seals Research Programme publications (Bond, 2019);
- academic papers and online reports as available for Study Area;
- designated sites condition assessments as available; and

- existing reference baseline data (where available and relevant) from other developments in the area (e.g. NZT Project will be used as background information).

6.8.16 There are no substantive differences in the baseline conditions between Main Site A and Main Site B and their respective connection corridors, with the exception that Main Site B is located closer to the Tees Estuary and Tees Mouth. Therefore, the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.8.17 During the construction of the Proposed Development there may be the requirement activities that would occur below MHWS, in the marine environment. At this stage, there are various construction methodologies being considered by the Applicant, but these may include the following below MHWS:.

- a crossing under of the River Tees for the proposed Hydrogen Pipeline Corridor; and
- a potential crossing of Greatham Creek for the proposed Hydrogen Pipeline Corridor (which connects further upstream to Claxton Beck) at multiple locations (including close to Seaton on Tees Channel Delta and Seal Sands), to the north-west of the Proposed Development Site.

6.8.18 Main Site A is located approximately 1 km east of the River Tees and approximately 0.7 km south of the North Sea (Tees Bay). Although the Proposed Development Site is above MHWS, it still has the potential to have effects on marine ecology and has been considered further below. Main Site B is located approximately 0.1 km east of the River Tees, and approximately 1.1 km south of the North Sea.

6.8.19 As outlined in Section 3.5: Hydrogen Pipeline, feasibility and design work on routeing options, and construction methodologies to be used within the Hydrogen Pipeline Corridor is ongoing. Currently it is proposed that the crossing under the River Tees would be constructed using either an existing pipeline/tunnel or by HDD or a MBT, thereby minimising disturbance during construction. The effects of noise and vibration on marine ecological receptors as a result of construction at this location has therefore been scoped out in.

6.8.20 For other sections of the Hydrogen Pipeline Corridor where it crosses Greatham Creek, various construction methodologies are being considered, including the use of the existing pipeline bridge close to Seal Sands, and below ground trenchless technologies (i.e., using HDD or a MBT). However, open-cut trenching is not being considered for the crossing of the Greatham Creek.

6.8.21 Given that many design elements of the Proposed Development have yet to be confirmed, development design and impact avoidance measures have not been finalised at this stage. Appropriates measures will be discussed with statutory consultees and stakeholders as the DCO progresses, including in particular with the MMO.

6.8.22 The Marine Ecology PEI and ES chapters will be completed in accordance with the CIEEM Guidelines for Ecological Impact Assessment (EcIA) in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2022). The method will be tailored to reflect the specific conditions of the marine environment, to ensure the high levels of movement of marine receptors between habitats and populations, are considered fully.

6.8.23 Permanent removal of habitat in the intertidal is not currently proposed. However, if this approach changes, consideration will be given to the requirements of the Environment Act 2021. This will include a BNG assessment which will be undertaken for the Proposed Development in accordance with the published Natural England Biodiversity Metric 3.1 (Panks *et al.*, 2022).

6.8.24 The marine ecology assessment will consider the construction, operation, and decommissioning of the Proposed Development. At this stage, there is not considered to be a pathway for effects to marine ecology as part of the operational phase of the Proposed Development, whilst effects during the decommissioning phase are considered to be the same (or less) than those during construction.

The below potential impact pathways and their resulting effects on marine ecological receptors will be considered in relation to the Proposed Development.

Direct Loss and Physical Disturbance to Habitats and Species Under the Footprint of the Marine Construction Works

- Open cut trenching within the Hydrogen Pipeline Corridor with crossings at Greatham Creek is not proposed as it could result in the temporary loss of benthic habitats and species at these locations.
- The use of trenchless technologies (i.e., HDD and MBT) and existing pipeline bridges, would result in the avoidance of this impact pathway. Non-intrusive crossings also involve excavations each side of riverbanks. However, these would be set back from the channel far enough that construction works could not cause bank instabilities and effects to nearby marine habitats and species as an embedded mitigation measure.

Physical Disturbance to Benthic Habitats and Species from Increased Suspended Sediment Concentrations (i.e. Increased Turbidity and Deposition)

- Open cut trenching at Greatham Creek is not proposed as it could result in the mobilisation of fine sediment at this location, which could be transported and deposited on habitats further downstream, such as saltmarsh and intertidal mudflats surrounding the embankments of the creek and at Seal Sands.
- Furthermore, sediment bound contaminants may also be released, although concentration of contaminants in the sediment at these locations is unknown.
- The use of trenchless technologies (i.e. HDD and MBT) and the existing pipeline bridge, would result in the avoidance of this impact pathway.

Indirect Effects to Marine Ecology from Changes in Marine Water Quality (Excluding Turbidity)

- Pollution of the River Tees and surrounding watercourses could occur due to spillages or polluted surface water run-off from construction activities as part of the Proposed Development (if an appropriate Environmental Management Plan is not adhered to and materials are not appropriately stored). These discharges have the potential to alter water quality in terms of physico-chemical, biological and chemical parameters with indirect effects to marine ecology.

Changes in the Airborne Soundscape and Visual Disturbance During Construction

6.8.25 Marine and land-based construction activities associated with the Proposed Development will create airborne sound and changes in visual cues which has the potential to disturb seals that have surfaced or have hauled out. This is particularly true of any works close to Seal Sands and Greatham Creek, where seals are known to occur.

6.8.26 It is likely that measures can be implemented either within the design of the Proposed Development or as additional mitigation to ensure no residual significant effects however as this will need to be assessed further within the noise and marine assessments and is scoped into the assessment at this stage.

6.8.27 Underwater sound has been scoped out from further assessment, on the basis of that the use of vessels has not been proposed; drilling / piling in the marine environment is not likely to be required; and Unexploded Ordnance (UXO) clearance is considered unlikely. There is also considered to be no pathway for effect for INNS.

6.8.28 The results of a full review of the available baseline data, and outcomes of any consultation responses will be used to inform the marine ecology assessment. Once the marine baseline for the Proposed Development has been fully described, any relevant marine ecology receptors that are likely to be significantly impacted by the Proposed Development will be identified.

6.8.29 Once design and impact avoidance measures have been taken into consideration any remaining significant adverse effects will be mitigated or compensated for and ecological enhancements recommended where appropriate. Following the implementation of mitigation and compensation, any residual effects on ecological receptors will be identified.

6.8.30 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.9 Traffic and Transportation

Baseline Conditions

6.9.1 The main route to the Proposed Development Site will be via the existing access/industrial roads from the A1085 trunk road, with access onto the wider local network and the A19 via the A66, A1053 and A174.

6.9.2 There are no PRoWs within Main Site A or B. The Teesdale Way long distance route runs adjacent to the northern boundary of the Main Site A and approximately 0.4 km north east of Main Site B.

6.9.3 There are 16 PRoWs within the Proposed Development Site, namely:

- bridleway 116/10/2, which runs along the eastern boundary of the Wilton International site, in Kirkleatham;
- footpaths 102/2A/1, 102/2A/2, 116/31/1, 116/31/2 and 116/31/3, which run adjacent to the Teesport Estate and Tees Dock Road;
- footpaths 102/2/1, 102/2/2 and 102/2/3 and bridleways 116/9/1 and 116/9/2, which are located to the south of the above footpaths and the Teesport Estate, and form part of the Teesdale Way long distance footpath and the England Coastal Path (Filey Brigg to Newport Bridge);
- footpath 31, which connects Cowpen Lane and Seal Sands Link Road;
- an unnamed footpath, which runs along the railway line north of Claxton Beck, north-east of Cowpen Bewley Woodland Park; and
- three unnamed footpaths, which run north-east from Tees Road to Marsh House Lane; part of the southernmost of these is part of the England Coastal path (Newport Bridge to North Gare).

6.9.4 These PRoWs may be affected by the final routes of the hydrogen pipelines and other connections.

6.9.5 In addition to the above, byway 30 is adjacent to the Proposed Development Site, north of Wolviston Back Lane. Bridleway 102/194/2 is adjacent to the Proposed Development Site in Grangetown.

6.9.6 Footpaths 116/1/1, 116/1/2, 116/2/1, 116/37/1, 116/38/1 and 116/39/1 and bridleways 116/32/1, 116/33/1 and 116/36/1 are also located to the north-east of the Proposed Development Site, in Warrenby and Coatham. Bridleways 116/32/1 and 116/36/1 are the closest of this group to the Proposed Development Site; at closest point (where they connect to the Teesdale Way long distance route), they are located approximately 310 m north-east of the Proposed Development Site. Bridleways 116/32/1 and 116/33/1 are part of the England Coastal Path (Filey Brigg to Newport Bridge).

6.9.7 Whilst some of the Proposed Development Site is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

6.9.8 Some of the options for the hydrogen pipeline routing cross the Tees Valley Railway Line. Consultation will be undertaken with Network Rail and Northern Rail (and other rail operators as appropriate) regarding the potential crossings of rail lines required.

6.9.9 There are no substantive differences in the baseline conditions between Main Site A and Main Site B, therefore the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.9.10 The following potential impacts may be associated with the Proposed Development:

- generation of traffic during construction (and decommissioning) affecting the local and strategic road network; and
- construction of connections outside of the Main Site, affecting road and rail links and PRoWs.

6.9.11 During the operational phase of the Proposed Development, it is anticipated that there will be a maximum workforce of up to 85 staff that will be required on a shift basis to be spread over a 24-hour period. Staff will travel to and from work in a variety of directions.

6.9.12 Natural gas will be delivered by pipeline and other operational and maintenance consumables will be managed to be kept as low as is reasonably practicable.

6.9.13 Therefore, it is anticipated that that the effects of operational traffic would be considerably lower than those generated during the construction phase.

6.9.14 Based upon the numbers of operational staff given above, it is proposed to scope out a detailed environmental assessment of this phase, in consultation with the relevant highway authorities.

6.9.15 The principal vehicle movements are anticipated to be associated with the construction phase of the Proposed Development.

6.9.16 The volume of construction vehicles associated with the delivery of plant and the labour force has not been fully determined at this stage, but as a worst-case scenario at this stage peak construction staff numbers are likely to be approximately 3,100 for both Phases 1 and 2.

6.9.17 This would equate to approximately 2,661 two-way vehicle movements per day during the peak construction period, based upon an average car occupancy for workers of 2.33 which is consistent with other developments in the local area. This peak is expected to last for approximately four months, between August 2025 and November 2025, assuming a July 2024 start date.

6.9.18 In terms of construction HGV and LGV movements there are predicted to be approximately 15,230 deliveries to the Main Site over the full period of construction, with 435 in the overall peak month of construction, November 2025, which then equates to approximately 40 two-way HGV movements per day, assuming a Monday to Friday working week.

6.9.19 There would also be approximately 4,333 HGV movements associated with the construction of the H_2 pipeline over the full period of construction, which would equate to a total of 542 in the peak month of November 2025, (approximately 50 two-way HGV movements per day).

6.9.20 To fully address the impacts of the construction phase on the transport network, a TA will be produced (though this will be confirmed following determination of the number of construction movements, in liaison with RCBC, as the highways authority, and National Highways). The scope for the TA will follow the guidelines set out in the PPG for 'Travel Plans, Transport Assessments and Statements' (DCLG, 2014).

RCBC and National Highways will be consulted so that their specific requirements can be accommodated within the TA scope.

6.9.21 The traffic and transport chapter will summarise the salient points from the TA. It will also relate the magnitude and significance of potential impacts to criteria contained in the Institute of Environmental Assessment (IEA) (1993) 'Guidelines for the Environmental Assessment of Road Traffic' and the DMRB Volume 11 'Environmental Assessment' (National Highways, 2022).

6.9.22 The scope of the TA will cover the following key areas:

- a review of national, regional and local transport policy including the relevant aspects of the documents identified in Section 5: Planning Policy and Need;
- a description of baseline and future baseline conditions, including link and junction flows (described further below), a review of highway safety issues including examination of personal injury accident data and consideration of accessibility by all main transport modes;
- calculation of construction traffic flows over the period of construction;
- distribution and assignment of construction traffic flows to the road network, including the identification of routes for any abnormal loads required;
- local network impact analysis – the size of the study area is to be confirmed with the local authorities and Highways England, and key junctions may be identified by these stakeholders that require detailed capacity analysis;
- consideration of the local PRoW network for leisure and commuting uses, and whether their use would be affected by the Proposed Development;
- construction of H_2, gas, water and electrical connections where these affect road and rail links;
- cumulative impact assessment; and
- the formulation of mitigation measures (where required), such as a Construction Worker Travel Plan (CWTP) to promote sustainable journeys during the construction phase of the development and where possible reduce single occupant car journeys, and a Construction Traffic Management Plan (CTMP) to seek to control the routing and impact that HGVs will have on the local road network during construction.

6.9.23 Consultation with RCBC and National Highways will identify the key junctions to be included within the assessment for which junction counts and/ or existing data will be required that may be supplemented by link counts along the identified preferred routes to site. The data will be used to quantify baseline vehicular demand along key routes to and from the Proposed Development and will also form the basis of calculations to quantify the impact of construction traffic on the surrounding road network.

6.9.24 As described earlier, it is considered that traffic and transport impacts are more likely to occur during the construction phase of the Proposed Development and therefore

an operational assessment is not proposed. A summary of any residual and cumulative impacts will be provided should the proposed mitigation not fully address the impact of the development on the transport network.

6.9.25 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.10 Landscape and Visual Amenity

Baseline Conditions

6.10.1 The Tees Lowlands NCA forms a broad, open plain dominated by the meandering lower reaches of the River Tees and its tributaries, with wide views to distant hills. The large conurbation around the Lower Tees and Teesmouth contrasts with the rural area to the south and west, which is largely agricultural in character.

6.10.2 Ecological European designated sites as outlined in Section 6.6: Ecology and Nature Conservation are in close proximity to heavy industry, which has developed due to the estuary's strategic location close to mineral reserves, a network of main roads, railways and Teesport. The existing industrial installations form a dramatic skyline when viewed from the surrounding hills.

6.10.3 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Proposed Development Site and the surrounding area. However, the RCBC 'Landscape Character Supplementary Planning Document' (March 2010) notes that this industry has a strong influence on neighbouring landscape character areas.

6.10.4 Covering much of the open land north and east of the Proposed Development Site, the South Gare and Coatham Sands are classified as a sensitive landscape "…*which much landscape structure is present to give high 'strength of character' which is sensitive to change*." Areas of the South Gare and Coatham Sands designation west and south-west of the Proposed Development Site are not included within this sensitive landscape classification.

The Proposed Development Site and its Setting (Landscape)

6.10.5 The Proposed Development Site and surrounding area are heavily influenced by large industrial structures and complexes as well as the residential settlements outlined in Section 2: Description of the Existing Environment. The industrial complexes within the Teesside industrial areas are heavily lit, which increases the areas visibility during the hours of darkness. The surrounding landscape contains localised tranquil areas including along the coast, River Tees and inland nature reserves, although the large-scale structures are ever present within views.

Representative Sensitive Receptors (Visual)

6.10.6 Viewpoints, chosen to represent a typical range of views of the Proposed Development, will be agreed with relevant stakeholders such as PINS, the relevant LPAs, Natural England, the Forestry Commission and local residents. The viewpoints will be chosen to include appropriate receptor types, likely to include:

- residential receptors and PRoW users;

- recreational uses; and
- road users.

6.10.7 There are no substantive differences in the baseline conditions between Main Site A and Main Site B, therefore the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.10.8 The following potential impacts may be associated with the Proposed Development:

- temporary changes to landscape character and views from sensitive receptors in the vicinity of the Proposed Development Site during construction and decommissioning; and
- permanent changes to landscape character and views from sensitive receptors in the vicinity of the Proposed Development Site during operation.

6.10.9 The proposed method of landscape and visual impact assessment has been devised to address the specific impacts likely to result from a development of its scale and nature. The methodology draws upon the following established best practice guidance:

- 'Guidelines for Landscape and Visual Impact Assessment' third edition (GLVIA3) (Landscape Institute and Institute for Environmental Management and Assessment (IEMA), 2013);
- 'Photography and photomontage in landscape and visual impact assessment' (Landscape Institute, Advice Note 01/11, 2011);
- Assessing landscape value outside national designations, Technical Guidance Note 02/21 (Landscape Institute, 2021); and
- Infrastructure, Technical Guidance Note 04/2020 (Landscape Institute, 2020).

6.10.10 The EIA process requires that a clear distinction is drawn between landscape and visual impacts, as follows:

- landscape impacts relate to the degree of change to physical characteristics or components of the landscape, which together form the character of that landscape, e.g. landform, vegetation and buildings; and
- visual impacts relate to the degree of change to an individual receptor's view of that landscape, e.g. local residents, users of public footpaths or motorists passing through the area.

6.10.11 An assessment of impacts on built heritage, including impacts on the setting of listed buildings and structures, will be included in the cultural heritage assessment as outlined in Section 6.11: Cultural Heritage.

6.10.12 A detailed study of the existing landscape components, character and views of the Proposed Development Site and an identified study area, developed following consideration of the ZTV discussed below, will be carried out in consideration of the following:

- site context (including industrial heritage);
- topography;
- vegetation including green infrastructure;
- roads, PRoWs and access;
- settlement and land-use;
- landscape character; and
- representative views.

6.10.13 This will be supported by and photographs as appropriate. The planning context with respect to landscape character and visual amenity will also be assessed, taking into account relevant European, national, regional and local planning policies. The baseline study will form the basis of the assessment of the predicted impacts of the Proposed Development.

6.10.14 Approximately 12 representative views will be identified within the Zone of Theoretical Visibility (ZTV) for the main building envelope and the potential stacks and taller columns, as well as any structures required for the connections. The ZTV will be generated using a bare ground Digital Terrain Model (DTM) and be reviewed in the field against the following criteria in order to determine the selection of representative views which form the basis of the visual assessment:

- receptor function/activity;
- distance from the Proposed Development Site;
- topography and elevation;
- degree and period of exposure;
- designation of the viewing place; and
- distribution of receptors.

6.10.15 It is anticipated sensitive visual receptors that will need to be considered will include receptors:

- to the north Seaton Carew, North Gare Sands, South Gare breakwater and the Headland at Hartlepool;
- to the east Redcar, Marske-by-the-Sea;
- to the south from Kirkleatham, New Marske, Wilton, Eston Nab, Old Lackenby; and
- to the east from Cowpen Bewley Park and Billingham.

6.10.16 An initial site visit will be undertaken together with a review of the full landscape and visual planning policy context in the vicinity of the Proposed Development Site. Using the Rochdale Envelope approach the assessment will be based upon the largest possible dimensions (maximum parameters) for the Proposed Development. Technical details regarding the height of the tallest elements of the Proposed

Development will then enable the definition of the Study Area within which landscape or visual impacts have the potential to be significant. At this stage, it is considered unlikely that the tallest element (the flare) will be higher than 100 m above ground level, however, any assumptions made in relation to the parameters defined for the purposes of the assessment will be clearly outlined.

6.10.17 Visual Representations of the Proposed Development for agreed representative views (visual receptors) will be produced in line with the guidance within the Landscape Institute Advice Note 01/11. The location of representative views and photomontages will be agreed in consultation with RCBC, STBC, HBC and other key stakeholders.

6.10.18 A full explanation of the criteria used to assess sensitivity, magnitude of impact and classification of landscape and visual effects will be outlined within the ES.

6.10.19 The impact of night-time light pollution will be considered however and given the existing high levels of lighting in the area, being industrial in nature, it is considered unlikely for significant effects on sensitive receptors there this has been scoped out of the assessment. As outlined in Section 3.16: Lighting, an Indicative Lighting Strategy will be prepared and submitted with the Application. This will be referred to as required within the LVIA chapter of the ES.

6.10.20 Where the assessment indicates the need for mitigation as a result of significant effects on landscape character or visual amenity, these will be outlined within the ES.

6.10.21 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.11 Cultural Heritage

Baseline Conditions

6.11.1 There are no designated heritage assets within the Proposed Development Site.

6.11.2 There are 505 listed buildings within 5 km of the Proposed Development Site. The closest are:

- Village Farmhouse, Little Neuk Farm Cottage, Nightingale's Farmhouse and Barn and Hall's Farmhouse, all Grade II listed and located in Cowpen Bewley, approximately 70 m south of the Proposed Development Site;
- Grade II* 'Phosphate rock silo number 15 at ICI works, Billingham', located approximately 100 m south of the Proposed Development Site; and
- three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 0.2 km north-east of the Proposed Development Site in Warrenby.

6.11.3 There are 22 Conservation Areas within 5 km of the Proposed Development Site, the closest of which are Cowpen Bewley Conservation Area, part of which falls within the Proposed Development Site, Kirkleatham Conservation Area, located approximately

260 m east of the Proposed Development Site, and Greatham Conservation Area, located approximately 550 m north-east of the Proposed Development Site.

6.11.4 There are 25 scheduled monuments within 5 km of the Proposed Development Site, the closest of which are:

- Claxton medieval moated site, located approximately 2 km north-east of the Proposed Development Site;
- Eston Nab hillfort, palisaded settlement and beacon (and approximately 20 Bronze Age barrows, relating to a prehistoric settlement and funerary landscape), are located on Eston Hills, approximately 2.4 km south of the Proposed Development Site; and
- 'World War I early warning acoustic mirror 650m north west of Bridge Farm', located approximately 3 km east of the Proposed Development Site, in Redcar.

6.11.5 There are two registered parks and gardens within 5 km of the Proposed Development Site: Grade II Albert Park, Middlesborough, located approximately 2.7 km south-east of the Proposed Development Site, and Grade II* Ropner Park, Stockton-on-Tees, located approximately 4.7 km south-east of the Proposed Development Site.

6.11.6 There are no world heritage sites or registered battlefields within 5 km of the Proposed Development Site.

6.11.7 There are approximately 700 non-designated heritage assets within 1 km of the Proposed Development Site, including approximately 180 within 1 km of the Main Sites, comprising find spot evidence, sites of post-medieval and modern industrial structures that are no longer extant, former landscape features including ridge and furrow, and defensive structures dating from the First and Second World War. Several Second World War pillboxes are located to the immediate north of Main Site A, in the dunes between Main Site A and Coatham Sands.

6.11.8 Two assets recorded on the Historic Environment Record (HER) are located partially within the Main Sites, comprising the site of a jetty at South Gare and a spur of rail which linked Redcar Iron Works to the jetty. These assets are no longer extant but there is a potential for subsurface, foundation remains to be present, depending on the extent of ground disturbance at the Proposed Development Site. In addition, there may be extant features of industrial archaeological interest present within the Proposed Development Site.

6.11.9 There are no substantive differences in baseline conditions between Main Site A and Main Site B. Therefore, the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.11.10 The following impacts may occur as a result of the construction and operation of the Proposed Development:

- physical, permanent impacts to non-designated heritage assets within the Proposed Development Site and along the connections during construction;

- temporary impacts to designated and non-designated heritage assets arising from changes to their setting during the construction of the Proposed Development; and
- permanent impacts to designated and non-designated heritage assets arising from changes to the setting during the operational phase of the Proposed Development.

6.11.11 A cultural heritage DBA will be produced to determine, as far as is reasonably possible from existing records, the nature of the cultural heritage resource within a Study Area of 1 km for non-designated assets. This Study Area is sufficient for identifying heritage assets within the Proposed Development Site that may be physically impacted by the Proposed Development and for providing relevant context for the archaeological and historical baseline narrative.

6.11.12 An initial larger Study Area of 5 km will be used to capture designated heritage assets data. This larger Study Area will be used to identify potential impacts to heritage assets arising from changes to their setting due to visual or aural intrusion, which may arise as a result of the Proposed Development. The final extent of this larger Study Area will be informed and refined by site visits and setting assessments carried out by the heritage team and also by the ZTV produced for the LVIA as outlined in Section 6.10: Landscape and Visual Amenity and noise contour data (as applicable) produced for the Noise and Vibration assessment.

6.11.13 Data sources consulted during the production of the DBA will include but not be limited to:

- National Heritage List for England database (Historic England, 2022);
- formal searches of the Redcar and Cleveland and Tees HER, including the Historic Landscape Characterisation data;
- online resources including the BGS (2022) Geology of Britain Viewer; Defence of Britain database and the LPA portal for the Local Plan and other relevant planning information;
- published and unpublished literature (including a detailed review of reports for previous fieldwork carried out within the proximity to the Proposed Development Site);
- existing geotechnical data; and
- documentary, cartographic and other resources as deposited within the local Archives and Local Studies Library.

6.11.14 The DBA and ES will comply with relevant legislation, national and local planning policy, specifically the NPPF and relevant Local Plans, and in line with the relevant guidance, including:

- PPG, Conserving and enhancing the historic environment (MHCLG, 2019b);

- Historic Environment Good Practice Advice in Planning Note 2. Managing Significance in Decision Taking in the Historic Environment. Historic England (Historic England, 2015);
- Historic Environment Good Practice Advice in Planning Note 3. The Setting of Heritage Assets. Historic England (2nd edition) (Historic England, 2017);
- Historic Environment Statement of Heritage Significance: Analysing Significance in Heritage Assets. Historic England Advice Note 12. Historic England (Historic England, 2019);
- Commercial Renewable Energy Development and the Historic Environment. Historic England Advice Note 15 (Historic England, 2021);
- Chartered Institute for Archaeologists (CIfA) Standard and Guidance for Historic Environment Desk-Based Assessment (CIfA, 2020);
- CIfA Code of Conduct (CIfA. 2022); and
- IEMA, the Institute of Historic Building Conservation (IHBC) and CIfA, Principles of Cultural Heritage Impact Assessment in the UK (IEMA, *et al.,* 2021).

6.11.15 Consultation with relevant heritage officers will be undertaken during the production of the DBA and the ES.

6.11.16 The assessment of potential effects will first determine the heritage significance (value) of heritage assets, which is defined in the NPPF (MHCLG, 2021) as deriving from its heritage interests which may be archaeological, architectural, artistic or historic (NPPF Annex 2, Glossary).

6.11.17 Once the value of each asset is defined, including the contribution its setting makes to its value, the level and degree of impact arising from the Proposed Development will be assessed taking into account any development design and impact avoidance measure (embedded mitigation). An assessment of the effects of the Proposed Development will then be determined and additional mitigation measures may be proposed where significant effects are predicted.

6.11.18 Given that construction methodologies such as HDD or MBT will be utilised during the construction of the hydrogen pipeline beneath the River Tees to minimise disturbance to sensitive receptors at this location, it is considered unlikely that the Proposed Development will result in direct impacts to marine cultural heritage assets. No construction works are proposed in areas below MHWS where there is the potential for marine cultural heritage receptors to be located and more highly concentrated (e.g. in the area of Tees Bay and the North Sea). It is considered unlikely that the construction/ operation of the Proposed Development would result in significant effects on Marine heritage assets and an assessment of impacts on Marine Cultural Heritage (those assets below MHWS) is proposed to be scoped out of the EIA.

6.11.19 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.12 Socio Economics and Land-Use

Baseline Conditions

6.12.1 Baseline conditions are defined for the socio economics Study Area against England as a whole. Office for National Statistics (ONS) statistical geographies will be used to define the Study Area, including the Lower Layer Super Output Areas (LSOAs) and the Wider Impact Area (assumed to be the Travel to Work Area (TTWA)) that the Proposed Development Site falls into. The LSOAs that the Proposed Development Site lies within are within the boundaries of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

6.12.2 The local population and labour market are the main receptors in the assessment for employment effects. Understanding the baseline conditions enables the impact of employment generated by the Proposed Development on the local population and labour market to be determined. The impact is mostly influenced by the size of the labour market and whether it has the relevant skills, occupations and sector strengths.

6.12.3 The socio-economics baseline will include data for the following geographies, to compare statistical information for:

- H2Teesside Study Area;
- Middlesbrough and Stockton TTWA; and
- England.

6.12.4 The scoping baseline has been carried out using a number of recognised data sources including the following:

- Population Estimates (ONS, 2020)[14];
- Census 2011 (ONS, 2012);
- Indices of Multiple Deprivation (MHCLG, 2019c); and
- Business Register and Employment Survey (ONS, 2021).

6.12.5 The list above is intended to provide an outline of sources however, additional datasets may be utilised in the preparation of the assessment.

[14] Includes the following Lower Layer Super Output Areas (LSOAs): E01012107: Redcar and Cleveland 003D, E01032560: Redcar and Cleveland 003E, E01032561: Redcar and Cleveland 003F, E01012114: Redcar and Cleveland 009B, E01012109: Redcar and Cleveland 011B, E01012198: Stockton-on-Tees 003B, E01012279: Stockton-on-Tees 004B. The selection of these LSOAs is based on a "best-fit" criteria to align to the Proposed Development Site. Other LSOAs including those from Hartlepool were reviewed, but they do not accurately represent the Proposed Development Site, and therefore have been excluded from this analysis.

Population

6.12.6 The H2Teesside Study Area is located between two local authorities, Redcar and Cleveland and Stockton-on-Tees, in the North-East of England. The population of the H2Teesside Study Area was 10,000 in 2020, which accounted for approximately 2% of the Middlesbrough and Stockton TTWA (ONS, 2020). In the H2Teesside Study Area, 62% of the population are of working age[15], which is in line with national averages and the TTWA. The proportion of elderly people (65+ years) in the H2Teesside Study Area (17%) is comparatively smaller than for the TTWA (20%), and nationally (19%), implying a smaller dependency ratio in the H2Teesside Study Area. This can be seen in Plate 6-1.

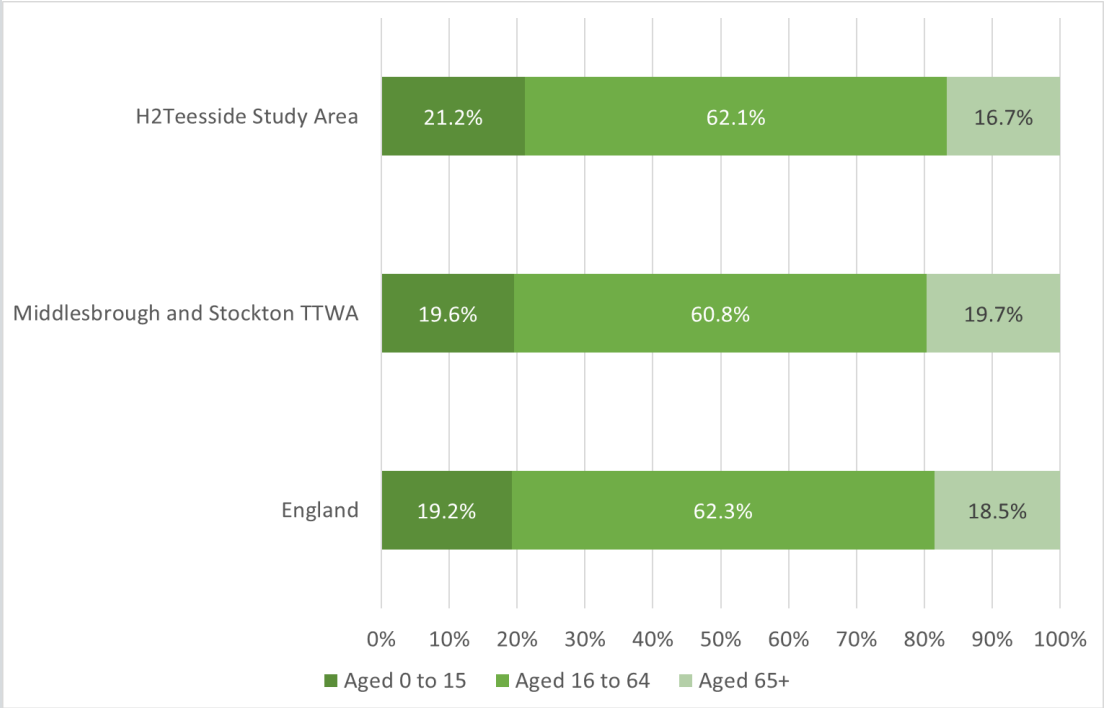

Plate 6-1: Population Age Breakdown (H2Teesside Study Area, Middlesbrough and Stockton Travel -To- Work Area, and England)

Source: Office for National Statistics Population Estimates, 2020.

Economic Activity Trends

6.12.7 Census 2011 data shows that in the H2Teesside Study Area, approximately 70% of the working age population are economically active, with the most common form of economic activity being full time employment (39%) (ONS, 2012). Rates of economic activity are higher in the H2Teesside Study Area than the TTWA area (66%) and nationally (65%). Of the economically active, approximately 4% are unemployed in the H2Teesside Study Area, compared to 6% for the TTWA and 9% nationally. Among

[15] Between 16 and 64 years of age.

the economically inactive in the H2Teesside Study Area, the most common reason is retirement.

Deprivation

6.12.8 Multiple sections of the H2Teesside Study Area lie in areas of relative deprivation. Of the seven LSOAs within the H2Teesside Study area, four are in the most deprived decile nationally (MHCLG, 2019c). More widely, areas of deprivation are prevalent in the local authorities in which the H2Teesside Study Area resides, as Redcar and Cleveland and Stockton-on-Tees are ranked the 40th and 73rd most deprived local authorities nationally.

Employment by Industry

6.12.9 In the H2Teesside Study Area, manufacturing (Sector C, 24% of total employment) is the largest industry; this percentage is considerably higher than the Middlesbrough and Stockton TTWA average (10%) and the national average (8%) (ONS, 2021). The second largest industry is transport and storage (Sector H, 18%), followed by business administration & support services (Sector N, 12%), both of which are higher percentages than the TTWA and national averages.

6.12.10 The employment percentages for the industries of mining, quarrying & utilities (Sectors B, D and E, 7%) and construction (Sector F, 7%) are comparatively higher for the Study Area than for the TTWA and national averages, whereas the percentages for retail (Sector G, 1%), education (Sector P, 3%) and health (Sector Q, 2.4%) for the Study Area are considerably lower than those for the TTWA and national averages. These trends can be seen in Plate 6-2.

Land Use

6.12.11 The Proposed Development Site is located within a largely urban area, consisting of existing and former sites of industrial installations north and south of the River Tees. The Main Sites are located on parts of the former Redcar Steelworks and the adjacent RBT Site. The connection corridors south of the River Tees are located within or in close proximity to the existing industrial area, generally following existing pipeline routes.

6.12.12 The connection corridors north of the River Tees also generally follow existing pipeline routes within existing industrial areas, but also extend into areas of open or agricultural land, north and west of the existing industrial area.

6.12.13 According to the Natural England Agricultural Land Classification (ALC) map for the North East Region (ALC001), part of the Proposed Development Site, near Kirkleatham, is located within Grade 2 'Very Good' agricultural land. ALC Grades 1 to 3 are classified as 'Best and Most Versatile' (BMV) land.

6.12.14 There are further areas of Grade 3 'Good to Moderate' agricultural land (potentially BMV) within the north-west of the Proposed Development Site, in the vicinity of Greatham. The remainder of the Proposed Development Site is located within areas of Grade 4 'Poor' or 5 'Very Poor' agricultural land, non-agricultural land ('land predominantly in urban use' or 'other land primarily in non-agricultural use'), and not BMV.

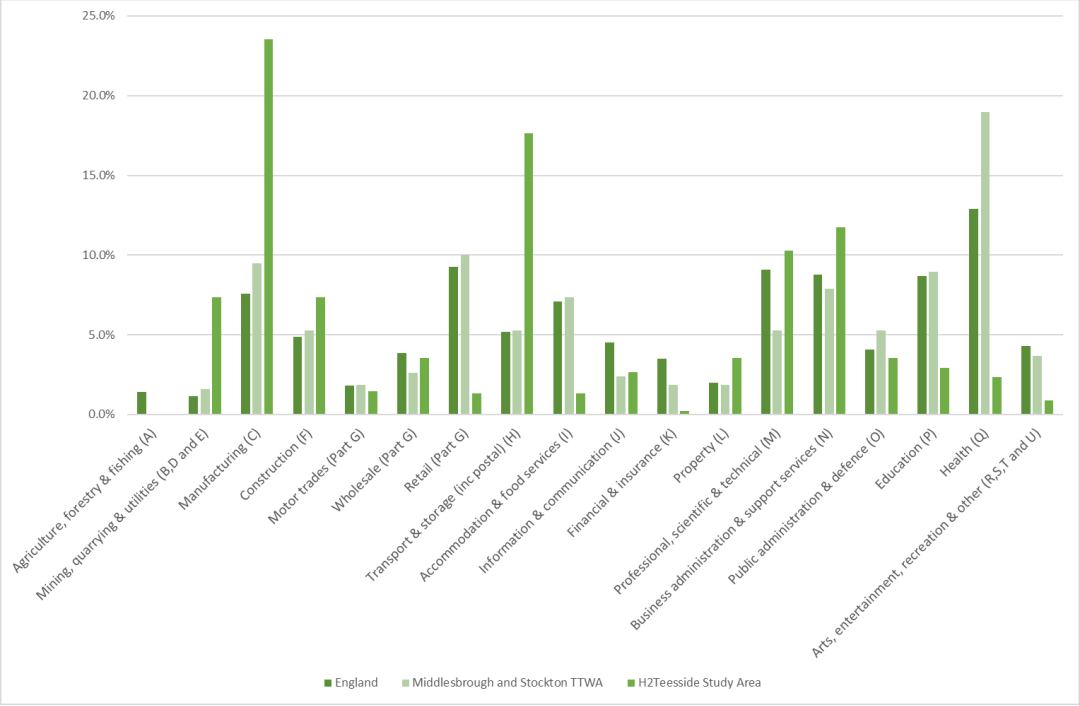

Plate 6-2: Employment by Industry (H2Teesside Study Area, Middlesbrough and Stockton Travel -To- Work Area, and England)

Source: Office for National Statistics Business Register and Employment Survey (BRES), 2020.

6.12.15 Given the locations of Mains Sites A and B, and that the connections corridor network for both is very similar, there are no substantive differences in the baseline conditions between them. Therefore, the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.12.16 The Proposed Development could have beneficial and adverse socio economic and land use effects that will need to be assessed. The approach to assessing the socio economics effects will be based on a proven and robust approach used for assessments of a similar nature. The assessment will be carried out using a number of recognised data sources.

6.12.17 It will consider the Proposed Development against established national and local policy standards and best practice benchmarks. This will include socio-economic policy justification for the Proposed Development and the contribution of activities associated with the Proposed Development to the socio economic policy objectives of RCBC, Tees Valley Combined Authority and STDC.

6.12.18 The chapter will also include a baseline assessment reviewing existing data outlining the relevant local policy context and a description of the existing socio economic conditions in the local study area including demographic data, labour market indicators; skills and unemployment and the local economic structure.

6.12.19 The assessment will consider the potential direct, indirect and cumulative socio economics impacts for each phase of the Proposed Development (construction, operation and decommissioning). It will draw on other assessments included in the ES where necessary. Wherever possible, the impacts identified in the assessment will be appraised against relevant national standards such as those provided by HM Treasury and Homes England (formerly the Homes and Communities Agency (HCA). Where relevant standards do not exist, professional experience and expert judgement will be applied and justified.

6.12.20 Mitigation measures (some of which may have already been considered through the development of the proposals) will be considered and key indicators for monitoring socio-economic impacts will be established.

6.12.21 The anticipated potential effects during the construction, operation, and decommissioning phases could include the following:

- direct and indirect employment creation;
- the potential for the promotion/provision of training and apprenticeship opportunities, upskilling locally unemployed and potential wider economic benefits;
- temporary disruption to traffic on the local and strategic road networks;
- temporary disruption to PRoWs;
- impacts on businesses either direct or indirect via in combination effects identified by other discipline assessments; and
- any land use impacts (such as effects on planned developments).

6.12.22 Where the Proposed Development Site interacts with areas of Grade 2 (BMV) and Grade 3 (potential BMV) agricultural land, these are all located within the Hydrogen Pipeline Corridor. The land would be used for construction of pipelines (as a worst-case assumed below ground open trench) and after pipeline installation, the trench would be infilled, and the soil disturbed would be reinstated in-situ (replicating existing strata as necessary). It is considered that significant effects are not likely, with any land use effects relating to agricultural land temporary, and an assessment of impacts on Agricultural Land is not required. The remainder of the Proposed Development Site is comprised of existing or former industrial land.

6.12.23 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.13 Climate Change

6.13.1 As outlined in Section 3.1: Overview, based on current projections (including Phase 1 and Phase 2 of the Proposed Development), H2Teesside would continuously export approximately 2.84 Mt/year (at 100% utilisation) of dehydrated and compressed CO_2.

6.13.2 It is considered that the Proposed Development would represent a significant step forward in the implementation of H_2 as a viable, low carbon fuel source for industrial,

transport, and other applications that could make a significant contribution to reducing CO_2 emissions.

Baseline Conditions

6.13.3 The baseline conditions for the climate change chapter will be a business-as-usual scenario whereby the Proposed Development does not proceed, for those lifecycle stages scoped into the assessment.

6.13.4 For the GHG assessment the current and future baseline comprises existing carbon stock and sources of GHG emissions within the Proposed Development Site. It is recognised that there are a number of fuels and energy vectors that may plausibly be replaced by hydrogen For information, whilst not part of the Proposed Development, the assessment can also consider the emissions that may potentially be avoided as a result of the Proposed Development, by the replacement of fossil fuels by the H_2 generated in the Proposed Development over its operational lifetime..

6.13.5 For the Climate Change Risk Assessment the current baseline is based on historic climate data obtained from the Met Office website (Met Office, 2023) recorded by the meteorological station closest to the Proposed Development (Stockton-on-Tees) for the period 1981-2010 indicates the following:

- average annual maximum daily temperature was 13.1 °C;
- warmest month on average was July (mean maximum daily temperature of 20.4 °C);
- coldest month on average was December (mean minimum daily temperature of 0.7 °C);
- average total annual rainfall levels were 574.19 mm;
- wettest month on average was August (60.62 mm of rainfall on average for the month); and
- driest month on average was February (32.9 mm of rainfall on average for the month).

6.13.6 The Future baseline assessment considers the RCP8.5 scenario of the UK Climate Projections 2018 (UKCP18; Met Office, 2018) for the 25 km^2 grid square within which the Proposed Development Site is located.

6.13.7 For the purpose of the assessment, UKCP18 probabilistic projections for the following average climate variables have been obtained and analysed:

- mean annual temperature;
- mean summer temperature;
- mean winter temperature;
- maximum summer temperature;
- minimum winter temperature;
- mean annual precipitation

- mean summer precipitation; and
- mean winter precipitation.

6.13.8 Projected temperature and precipitation variables are presented in Table 6-6 and Table 6-7 below. UKCP18 probabilistic projections have been analysed for the 25 km grid square where the Proposed Development is located. These figures are expressed as anomalies in relation to the 1981-2010 baseline.

6.13.9 As the design life of the Proposed Development may exceed the predicted lifespan of 25 years, the assessment has considered a high emissions scenario at the 10%, 50% and 90% probability levels to assess the impact of climate change up to 2100.

Table 6-6: Projected Changes to Temperature Variables 50th Percentile (RCP 8.5) (10th to 90th Percentile Presented in Parenthesis)

CLIMATE VARIABLE	TIME PERIOD		
	2020-2049	2040-2069	2070-2099
Mean annual air temperature anomaly at 1.5m (°C)	+1.0 (+0.4 to +1.6)	+1.3 (+0.6 to +2.1)	+2.1 (+1.0 to +3.2)
Mean summer air temperature anomaly at 1.5m (°C)	+1.0 (+0.2 to +1.8)	+1.3 (+0.3 to +2.3)	+2.4 (+0.7 to +4.2)
Mean winter air temperature anomaly at 1.5m (°C)	+1.0 (+0.0 to +1.9)	+1.3 (+0.1 to +2.5)	+1.9 (+0.5 to 3.5)
Maximum summer air temperature anomaly at 1.5m (°C)	+1.1 (+0.2 to +2.1)	+1.5 (+0.3 to +2.7)	+2.6 (+0.8 to +4.6)
Minimum winter air temperature anomaly at 1.5m (°C)	+1.0 (+0.0 to +2.0)	+1.3 (+0.2 to +2.4)	+1.9 (+0.5 to +3.3)

Table 6-7: Projected Changes to Precipitation Variable (%)

CLIMATE VARIBALE	TIME PERIOD		
	2020-2049	2040-2069	2080-2099
Annual precipitation rate anomaly (%)	+4.5 (-1.5 to +11.2)	+1.5 (-3.5 to +6.9)	+0.8 (-6.0 to +8.3)
Summer precipitation rate anomaly (%)	-2.0 (-16.8 to +14.7)	-5.1 (-19.9 to +11.3)	-16.4 (-36.6 to +5.5)
Winter precipitation rate anomaly (%)	+9.5 (-3.0 to +22.8)	+12.0 (-1.2 to +26.3)	+14.6 (-4.3 to +35.7)

6.13.10 There are no substantive differences in the baseline conditions between Main Site A and Main Site B. Therefore, the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.13.11 The GHG Study Area includes all GHG emissions from within the Proposed Development Site arising as a result of the Proposed Development during all phases.

6.13.12 The receptor for GHG emissions is the global climate as the effects are not geographically constrained, which means all development has the potential to result in a cumulative effect on GHG emissions. The UK's relevant five-year carbon budget will be used as a proxy for the global climate.

6.13.13 A discussion of the GHG emissions from the energy sector in the UK will be provided. The GHG emissions resulting from alternative energy sources and vectors, that could realistically be replaced by low carbon H_2 from the Proposed Development will be considered. These could include natural gas, diesel fuel for HGV transport, or coke used for steel production.

6.13.14 This section will draw on guidance including the GHG Protocol (World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), 2004), PAS2080 (BSI, 2016), and the updated IEMA guidance on 'Assessing Greenhouse Gas Emissions and Evaluating their Significance' (IEMA, 2022) such that it will provide discussion and, where relevant, assessment of:

- the scope of the assessment;
- baseline GHG emissions;
- alternative emissions (i.e., future baseline without the Proposed Development);
- net assessment of the direct emissions of the Proposed Development; and
- any mitigation (or other) CO_2 emissions savings throughout the operational life of the Proposed Development.

6.13.15 To align with the requirements of the EIA Regulations 2017 and associated published guidance, three separate aspects have been considered in scoping the climate assessment:

- Lifecycle GHG impact assessment: The effect on climate change of GHG emissions arising from the Proposed Development, including how the Proposed Development will affect the ability of UK Government to meet reduction targets within its carbon budgets. The lifecycle GHG assessment will consider emissions from the following stages:
  - Product stage: including from the manufacture and supply of the products and materials required to build the Proposed Development.
  - Construction stage: including from construction activities, transportation of workers and materials to the Proposed Development Site, and transportation and disposal of waste construction materials.
  - Operational stage: including from the consumption of energy and materials, supply of water and treatment of wastewater, and worker commuting during the operational phase. Emissions potentially avoided as a result of H_2 generated from the Proposed Development.

- Decommissioning stage-including from on-site decommissioning activity, transportation and disposal of waste materials, and worker travel. Emissions from decommissioning are frequently subject to considerable uncertainty due to the timescales involved.

- In-combination climate change impact (ICCI) assessment: The combined impact of the Proposed Development and potential climate change on receptors in the receiving environment; and
- Climate Change Resilience (CCR) assessment: The resilience of the Proposed Development to climate change impacts, including how the design takes into account projected impacts of CCR of the Proposed Development to impacts from projected climate change, using the RCP8.5 projections from UKCP18 as a worst-case scenario.

6.13.16 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.14 Major Accidents and Disasters

Baseline Conditions

6.14.1 The Study Area for assessment of Major Accidents and Disasters (MA&Ds) is not defined within regulatory guidance or standardised methodology, however it is likely that a Study Area of 5 km from the Proposed Development Site will be utilised.

6.14.2 For the purpose of EIA Scoping, a high-level review of installations in close proximity to the Proposed Development Site has been undertaken and an initial list is illustrated on Figure 14: Major Accidents and Disasters Receptors within 5 km of the Proposed Development Site Boundary (Appendix A). This area of Teesside includes installations regulated by the Control of Major Accident Hazard (COMAH) Regulations 2015 and major accident hazard pipelines regulated by the Pipelines Safety Regulations (PSR) 1996. The Study Area may be refined during later stages of assessment, as information on the location and risks associated with particular hazards is developed.

6.14.3 The following data sources have been utilised to inform the scoping baseline:

- National Risk Register of Civil Emergencies (Cabinet Office, 2017);
- BGS GeoIndex Onshore (BGS, 2022);
- HSE's COMAH 2015 Public Information Search (HSE, 2015); and
- Google aerial and street view maps covering the study area (Google, 2020).

6.14.4 As the Proposed Development's design progresses, additional datasets may be included where relevant to assist the assessment of MA&Ds.

Environmental Baseline of Relevance to MA&Ds

6.14.5 A description of the environmental baseline of the different parts of the Proposed Development Site is presented in Section 2: Description of the Existing Environment, so is not repeated here.

6.14.6 Teesside has a temperate oceanic climate typical of the UK. Four earthquakes (of maximum magnitude 3.1) have been recorded in the Study Area since 1994, but none of these were classified by the BGS as significant. As described in Section 6.3: Surface Water, Flood Risk and Water Resources, parts of the Proposed Development Site are located within Flood Zones 1, 2, and 3.

Infrastructure and Industrial Sites

6.14.7 The Teesside area is a significant industrial hub, with the chemical industry operating in this location for over a hundred years. Chemicals still make up a large proportion of the industrial sites in the area, along with oil and gas facilities and the nearby Hartlepool nuclear power station.

6.14.8 There are currently several COMAH regulated sites within the Study Area with operations in the following categories:

- bulk and fine chemical Installations, with operations (including manufacture/production, disposal, storage/warehousing and distribution);
- fuel Installations, including refining and storage/distribution;
- waste storage, treatment and disposal sites;
- water and sewage collection, supply and treatment; and
- power generation, supply and distribution.

6.14.9 Due to the nature of industry in Teesside, there is an existing network of buried pipelines present in the vicinity of the Main Sites A and B, including major hazard pipelines regulated in accordance with the PSR (1996). There is also significant infrastructure associated with the transmission and distribution of energy including high voltage (HV) 400 kV overhead power lines in the vicinity of Main Sites A and B.

6.14.10 Transport infrastructure in the area includes ports, road and railway lines. Teesport, located approximately 1 km to the south-west of Main Site A, is the UK's fifth biggest seaport, handling 28 million tonnes of cargo annually. Primary roads in the area include the A19, A174, A66, and the A689. Middlesbrough, Billingham, South Bank, Seaton Carew and South Bank train stations and their associated rail lines also fall within the Study Area. Teesside Airport is the nearest airport, located approximately 11.5 km south-west of the Proposed Development Site.

6.14.11 The nearest residential areas to Main Sites A and B include areas within the districts of Middlesbrough and Redcar & Cleveland. There are also residential receptors close to the hydrogen pipeline and connections within the districts of Stockton-on-Tees and Hartlepool.

6.14.12 The estimated total populations of Middlesbrough, Redcar & Cleveland, Stockton-on-Tees, and Hartlepool are 143,900, 136,500, 196,600, and 92,300, respectively (ONS, 2022).

Sensitive Environmental Receptors of Relevance to MA&Ds

6.14.13 The following sensitive receptors which could be vulnerable to a MA&Ds have been identified:

- private residences (and their inhabitants) within the local area;
- local economic receptors including businesses and employees;
- community receptors, including PRoW, community land, and community buildings;
- the historic and cultural environment including archaeological heritage and built heritage;
- designated ecological sites, primarily the Teesmouth and Cleveland Coast SPA, Ramsar site and SSSI;
- the water environment, including groundwater, the River Tees, and the North Sea;
- infrastructure and built environment including transport infrastructure, industrial infrastructure, and energy infrastructure; and
- the interactions between the receptors above.

Summary of Current MA&Ds Risks

6.14.14 The Proposed Development Site is located within an area which has several COMAH installations, forming a 'domino group'. These are groups of sites where the risks or consequences of a major accident may be increased due to the proximity of the sites to each other. These risks include, but are not limited to: fire, explosion, release of (flammable, toxic, asphyxiant, corrosive, environmentally harmful etc.) substances to air, water, ground and groundwater.

6.14.15 There are no substantive differences in the baseline conditions between Main Site A and Main Site B. T, therefore the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.14.16 There is no specific guidance available which sets out the approach for undertaking a MA&Ds assessment within an EIA. However, the scope of the assessment has been developed with reference to "Major Accidents and Disasters in EIA: A Primer" (IEMA, 2020) which lays out emerging best practice. In addition to this guidance, there is a considerable amount of information and guidance available to developers on the identification and control of major hazards associated with industrial chemical processes, the storage and use of chemicals, and major accident hazard pipelines conveying hazardous fluids.

6.14.17 MA&D scenarios will be considered for each phase of the Proposed Development.

6.14.18 The following process has been used to identify credible MA&Ds scenario categories, to be scoped in or out of detailed assessment in the ES:

- An assessment of the substances which will be present on site to identify those classified as hazardous in accordance with the Classification, Labelling and Packaging (CLP) Regulations 2015.

- A review of the operations and activities carried out throughout the lifecycle of the Proposed Development, to determine the potential for a loss of containment of these materials. Substances which are not classified as hazardous or are present in relatively minor quantities can be discounted at this stage.

6.14.19 Incidents which could have relatively minor consequences, regardless of the likelihood of occurrence, are scoped out of assessment as they do not fall into the definition of a MA&D.

6.14.20 Incidents which could have significant consequences to people and/ or the environment are considered credible MA&Ds scenarios. For the Proposed Development, the definition of significant consequences would align with the criteria listed within the COMAH Regulations. This includes an event which causes fatal injuries to one or more people or causes harm to 0.5 ha of a protected environmental site.

6.14.21 A long list of potential MA&Ds categories is presented in Appendix B and includes the initial assessment used to determine whether or not further assessment is required. From this list, MA&Ds which are considered very unlikely to occur (for example due to the location of the Production Facility) have been scoped out. Furthermore, any hazards for which there is no credible source-pathway-linkage have also been scoped out.

6.14.22 All remaining MA&Ds have therefore been scoped into the assessment. Where there is a lack of information at this time regarding any MA&Ds, this has been scoped in as a precautionary measure. The long list of credible MA&Ds is subject to change as more information becomes available during the course of the assessment.

6.14.23 Where a scoped-in MA&D risk is covered fully in a separate discipline chapter, this information will not be duplicated in the MA&Ds chapter but will be cross-referenced and summarised as required with relevance to MA&Ds.

6.14.24 Events with a high likelihood of occurrence and significant consequences are not associated with the Proposed Development. Legislation including COMAH and PSR ensures that facilities with this category of risk are not permitted.

6.14.25 The key substances which would be present at the Production Facility include the following:

- H_2, which is classified as extremely flammable. The production of H_2 is the purpose of the Proposed Development, however, if released, could result in a fire and/ or explosion.
- Natural gas, which is used to manufacture H_2. It is a hydrocarbon mixture comprising mostly of CH_4, which is classified as extremely flammable. If released, there is the potential for a fire and/ or explosion.
- Syngas ('Synthesis Gas'), which is produced in an intermediate process stage and is a mixture comprising H_2, CO, which is classified as toxic and CO_2. The hazards associated with this substance include a fire and/ or explosion. If unignited, the CO content of this gas could cause harm to people onsite.

- O_2, which is used in the production process, is classified as an oxidant, therefore can cause or intensify a fire if released and in contact with combustible materials. This includes both liquid and gaseous oxygen.
- CO_2, which is produced as a by-product of the manufacturing process and would be exported offsite via pipeline. If a significant quantity of CO_2 is released in high concentrations, this gas can present a risk of asphyxiation.
- Aqueous NH_3, which would be used to reduce emissions from combustion equipment. This substance is classified as harmful to the aquatic environment, however, is unlikely to present in significant quantities. There is a low potential for a major accident and can therefore be scoped out of the assessment.
- An amine solution, which would be used for carbon capture. This type of substance is generally classified as harmful, as it would cause irritation if inhaled or in contact with the skin or eyes. It is not considered to present a risk of a major accident hazard therefore is scoped out of the assessment.
- Substances would be used to treat water and effluent generated by process operations such as biocides. The quantities stored on site are considered to be relatively minor therefore a release would not be a credible MA&Ds scenario and can be scoped out.
- Diesel, which would be used on-site for fuel in backup generators, is classified as flammable and harmful to the aquatic environment. The quantity of diesel would be relatively minor and there is a low potential for a major accident therefore can be scoped out of the assessment.
- Catalyst materials, which would be used for a number of processes including gas purification and steam reformation of natural gas and hydrocarbons.
- Liquid nitrogen, which would be associated with the ASU. It would be used for purging at start-up and shutdown, and for circulation during plant warm-up.
- Substances used during construction such as liquid concrete could be present in significant quantities and would be harmful if a release occurred in which material entered a watercourse. However, the controls around the storage and use of this substance are such that this is not considered to be a credible MA&Ds scenario.
- There is the potential for ground contamination in the area of the Main Site which is a legacy of the industrial nature of the site. This could include substances which if released to the environment have the potential to cause harm.
- No specific materials have been identified at this stage which would only be present on-site during decommissioning.

6.14.26 The pipeline corridors associated with the Proposed Development would contain natural gas supplied to the site, H_2 delivered to offtakers within the Teesside industrial area and CO_2 which would be exported for geological storage.

6.14.27 The technology used for the manufacture of H_2 from natural gas is well established and the equipment to be used will be designed and constructed to precise industry

standards. This industry is subject to rigorous safety and environmental regulations, with operators of such facilities required to demonstrate integrity via the submission of Safety Case documentation. In addition, the operational site will be regulated through other consents and licences as outlined in Section 3.10: Materials Storage, such as Hazardous Substances Consent, COMAH Licensing, and an environmental permit and these regulatory regimes will demand appropriate systems, controls and management procedures to safeguard workers and off-site receptors. There is a very low risk of failure to occur which could result in a loss of containment of hazardous substances. However, if this were to happen, credible and worst-case major accident scenarios have been identified for assessment as part of the EIA.

6.14.28 For those MA&Ds category types which have been scoped in for detailed assessment in the ES, the following assessment process which will be used:

- collate and review relevant baseline information regarding location, hazardous properties of substances, and site operations;
- identify credible scenarios related to the scoped in major event types;
- determine the potential impact of credible scenarios on receptors;
- assess the magnitude and likelihood of impacts of credible scenarios;
- identify mitigation measures to eliminate risk where possible; and if not possible, to reduce risk to a level demonstrated to be as low as reasonably practicable (ALARP); and
- qualitatively consider the significance of any residual risks.

6.14.29 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.15 Materials and Waste

Baseline Conditions

6.15.1 The Study Areas for the materials and waste assessment will be defined in line with the IEMA Guide to: Materials and Waste in Environment Assessment, Guidance for a Proportionate Approach (referred from herein as the 'IEMA Guidance') (IEMA, 2020).

6.15.2 Baseline data relevant to the Proposed Development has been reviewed to date for:

- impacts on allocated/safeguarded mineral and waste sites within the Proposed Development Site (operational sites identified within local plans e.g. quarries, wharfs, concrete plants etc.);
- presence of historic and permitted landfills within the Proposed Development Site;
- presence of permitted waste sites and waste site applications within the Proposed Development Site; and
- presence of Mineral Safeguarding Areas (MSAs) within the Proposed Development Site (an area designated by Minerals Planning Authorities (MPAs)

which covers known deposits of minerals which are desired to be kept safeguarded from unnecessary sterilisation by non-mineral development).

6.15.3 Additional baseline information will be gathered and presented in the PEI Report and ES for:

- construction and operational waste generation within the Proposed Development Site;
- use of construction materials within the Proposed Development Site;
- non-hazardous, inert and hazardous construction and operational waste management (Yorkshire and the Humber and the North-East regions);
- hazardous construction waste and operational waste management (England); and
- availability of key construction materials (nationally and Yorkshire and the Humber and the North-East regions).

6.15.4 An initial review of baseline conditions within the Proposed Development Site has been undertaken and consists of:

- historic landfill sites and permitted landfill sites as shown in the Environment Agency's Historic Landfill Sites (Environment Agency, 2021a) and Permitted Waste Sites - Authorised Landfill Site Boundaries data sets (Environment Agency, 2021b), further information is provided in Section 6.4: Geology, Hydrogeology and Contaminated Land;
- a number permitted waste sites and waste site applications as outlined in the Environment Agency's Environmental Permitting Regulations – Waste Sites (Environment Agency, 2022f);
- a safeguarded wharf, and a MSA for marine dredged Sand and Gravel at Tees Dock (Redcar and Cleveland) and a safeguarded wharf at Billingham Reach Industrial Estate (Stockton on Tees) (Tees Valley, 2011a);
- a MSA for gypsum (anhydrite) across the whole of the Tees Valley plan area (Tees Valley, 2011a) and a MSA for salt in Redcar and Cleveland Local Plan area (Redcar and Cleveland Borough Council, 2018);
- a General Location for Large Waste Management Facilities, this covers industrial areas to the north and south of the River Tees (Tees Valley, 2011a); and
- safeguarded sites at Haverton Hill (Stockton-on-Tees, construction, and demolition waste recycling) and South Tees Eco-Park (Redcar and Cleveland). The Proposed Development Site is adjacent to New Road, Billingham (Stockton-on-Tees, construction and demolition waste recycling) (Tees Valley, 2011b).

6.15.5 There are no substantive differences in the baseline conditions between Main Site A and Main Site B. Therefore, the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.15.6 The assessment will follow the methodology set out in the IEMA Guidance (IEMA, 2020).

6.15.7 For the purpose of this scoping report, materials and waste comprise:

- the consumption of materials (key construction materials only); and
- the generation and management of waste.

6.15.8 Materials are defined in the IEMA Guidance materials as "*physical resources that are used across the lifecycle of a development. Examples include key construction materials such as concrete, aggregate, asphalt and steel.*"

6.15.9 Other material assets considered include built assets such as landfill void capacity and allocated/safeguarded mineral and waste sites.

6.15.10 Waste is defined as per the Waste Framework Directive (E Waste FD) (EU, 2008) as "*any substance or object which the holder discards or intends or is required to discard*".

6.15.11 IEMA Guidance offers two methods for the assessment of waste. Method W1 – void capacity has been selected as this is a more detailed methodology and is appropriate for larger and more complex projects.

6.15.12 The IEMA guidance *"does not consider waste processing and recovery facilities as sensitive receptors, rather: they are part of a system that has the potential to reduce the magnitude of adverse impacts associated with waste generation and disposal. Waste processing and recovery facilities are, hence, different to landfills, in that the latter are finite resources."* However, since some of the operational hazardous wastes likely to be generated by the Proposed Development may not be suitable for landfill disposal (e.g. liquid waste), where possible, hazardous operational waste will be compared to national hazardous waste management facility capacity in the assessment.

6.15.13 The assessment of materials and waste will consider:

- waste producers have a legal duty of care to manage their waste in accordance with regulations and to ensure that any waste leaving the Proposed Development Site where it is generated is transferred to a suitably licensed facility for further treatment or disposal;
- facilities transferring, treating or disposing of waste must be either licensed or apply for an exemption from a license, and impacts arising from the operation of waste management facilities are considered as part of the planning and permitting process for these facilities themselves;
- as part of their planning function, Waste Planning Authorities (WPAs) are required to ensure that sufficient land is available to accommodate facilities for the treatment of all waste arising in the area, either within the WPA area, or through export to suitable facilities in other areas; and

- MPAs are similarly required to ensure an adequate supply of minerals, sufficient to meet the needs of national and regional supply policies, and local development needs.

6.15.14 The following matters will be scoped out of the assessment of materials and waste:

- Waste arising from extraction, processing and manufacture of construction components and products. This is based on the assumption that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different regions of the UK or the world and outside of the geographical scope of this study. Such matters cannot be accurately predicted and assessed in the ES as they relate to procurement decisions that cannot be assured.
- Other environmental impacts associated with the management of waste from the Proposed Development (e.g. on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste) are addressed separately in other relevant chapters.
- Direct impacts on MSAs. The Proposed Development Site lies within MSAs however impacts on MSAs are not assessed in the materials and waste assessment in accordance with the IEMA Guidance. MSAs are included for context in the baseline since MSAs are a planning consideration. The Proposed Development uses previously developed industrial land or existing utilities corridors. The Proposed Development would not sterilise or prejudice the future extraction of the mineral resource because the anhydrite and salt resources occur at depth and can either be extracted in an alternative way (mining or brine solution) or there is evidence that the resource may have been sufficiently depleted by previous extraction (anhydrite). This would be considered further in the Planning Statement submitted with the Application.
- Effects associated with decommissioning as the Proposed Development has a long design life and such it is not considered possible to reliably forecast decommissioning requirements and infrastructure far in the future. A Decommissioning Environmental Management Plan and would consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated.

6.15.15 Due to the uncertainty about the nature of mitigation(s) and the method by which mitigation(s) would be secured, material use and waste generation during the construction and waste generation during operation of the Proposed Development is scoped into the assessment. Allocated/safeguarded mineral and waste sites are scoped into the assessment, such sites are a planning consideration and further consultation and assessment in accordance with MPA policies may be required.

Table 6-8 Table 6-8provides a summary of the matters to be scoped in and out of the assessment.

Table 6-8: Summary of Proposed Scope of Materials and Waste

PROPOSED DEVELOPMENT PHASE	POTENTIAL EFFECTS	SCOPE IN/ OUT
Construction	Changes in demand for materials	Scope in
	Changes in available landfill capacity	Scope in
	Changes to allocated/safeguarded mineral site	Scope in
	Changes to allocated/safeguarded waste site	Scope in
Operation	Changes in availability of materials	Scope out
	Changes in available landfill void capacity	Scope in
	Changes in available waste management facility capacity (hazardous waste only)	Scope in
Decommissioning	Changes in demand for materials	Scope out
	Changes in available landfill capacity	Scope out
	Changes to allocated/safeguarded mineral site	Scope out
	Changes to allocated/safeguarded waste site	Scope out

6.15.16 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.16 Human Health

Baseline Conditions

6.16.1 Public health profile data produced by Public Health England (PHE) (PHE, 2022a), published under the Public Health Outcomes Framework (PHOF) (PHE, 2022b) has been reviewed for the purposes of this EIA Scoping Report. A human health profile will be developed for the PEIR which focuses on key indicators identified by PHE at ward level, including a comparison with district and national averages. This profile will be consolidated by engaging with the Integrated Care Board and the relevant local authorities.

6.16.2 The Proposed Development Site intersects seven electoral wards:

- South Bank, in Redcar and Cleveland;
- Dormanstown, in Redcar and Cleveland;
- Grangetown, in Redcar and Cleveland;
- Billingham East, in Stockton-on-Tees;
- Billingham South, in Stockton-on-Tees;
- Fens and Greatham, in Hartlepool; and
- Seaton, in Hartlepool.

6.16.3 For each of these areas, indicators deemed relevant to the likely human health effects of the Proposed Development have been identified; data relating to these indicators and the comparative geographies is set out in Table 6-9.

6.16.4 An initial review of the human health baseline has been undertaken using a number of recognised data sources including:

- Census 2020 (ONS, 2021);
- Census 2011 (ONS, 2012)[16];
- Population Estimates (ONS, 2022); and
- PHE (2022a; 2022b).

6.16.5 The list above is intended to provide an outline of sources and it should be noted that additional datasets may be used in the preparation of the PEI Report.

6.16.6 There are no substantive differences in the baseline conditions between Main Site A and Main Site B, therefore the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.16.7 This chapter will identify the communities that would be subject to impacts associated with the Proposed Development and will identify the potential effects on the health and wellbeing of those communities in Redcar and Cleveland and Stockton-on-Tees, Teesside and wider area if required, as a consequence of the Proposed Development.

6.16.8 This chapter will consider the Proposed Development in the context of established national and local policy standards and best practice benchmarks. This will include human health policy alignment with the Proposed Development.

6.16.9 In November 2022, the Institute of Environmental Management and Assessment (IEMA) published new guidance on assessing human health as part of EIA (IEMA, 2022b; IEMA, 2022c). Prior to this, there was no consolidated methodology or practice for the assessment of human health effects. The human health assessment will be based on this new IEMA guidance and it will consider the potential impacts for each phase of the Proposed Development. Wherever possible, the impacts identified in the assessment will be appraised against relevant national standards. Where relevant standards do not exist, professional experience and expert judgement will be applied and justified.

[16] Please note that data from the 2011 Census has only been used in the absence of more recent data.

Table 6-9: Human Health Baseline Indicators

	FENS AND GREATHAM	SEATON	BILLINGHAM EAST	BILLINGHAM SOUTH	DORMANSTOWN	GRANGETOWN	SOUTH BANK	HARTLEPOOL	STOCKTON-ON-TEES	REDCAR AND CLEVELAND	ENGLAND
Population aged under 16 (%) (2020/21)	13.8	17.6	24.1	21.1	20.4	28.6	24.0	19.2	20.0	17.7	19.2
Population aged 65+ (%) (2020/21)	31.0	23.7	15.9	19.1	19.0	11.0	14.8	19.6	18.7	23.3	18.5
Unemployment rate (% claiming out of work benefit) (2021/22)[10]	-	-	6.8	5.8	6.9	12.7	10.7	6.8	5.4	5.5	5.0
Long-term unemployment (%) (2021/22) [10]	-	-	4.5	3.8	2.4	13.6	9.4	3.1	4.0	4.4	1.9
General Health – good or very good (%) (2011)	75.9	78.7	75.4	77.1	75.1	75.5	72.2	76.0	79.9	76.3	81.4
General Health – bad or very bad (%) (2011)	7.5	6.5	8.2	7.7	8.7	9.2	9.8	8.1	6.3	7.8	5.5
Life expectancy at birth (female) (years) (2016-20)	86.2	81.8	79.0	79.5	80.9	78.9	75.2	81.3	81.3	81.5	83.2
Life expectancy at birth (male) (years) (2016-20)	81.4	78.8	75.5	77.7	74.4	72.5	73.0	76.5	78.2	77.6	79.5

	FENS AND GREATHAM	SEATON	BILLINGHAM EAST	BILLINGHAM SOUTH	DORMANSTOWN	GRANGETOWN	SOUTH BANK	HARTLEPOOL	STOCKTON-ON-TEES	REDCAR AND CLEVELAND	ENGLAND
Obese adults (%) (2020/21)[17]	-	-	-	-	-	-	-	34.6	40.2	33.4	25.3
Obese children (reception year) (%) (2020/21)	11.1	8.3	8.6	14.3	16.6	13.7	14.0	12.8	9.8	12.0	9.9
Smoking prevalence in adults (%) (2021)[10]	-	-	-	-	-	-	-	17.3	12.5	13.3	13.0
Mortality rate from Chronic Obstructive Pulmonary Disease (COPD) (2017-19)[10]	-	-	-	-	-	-	-	77.9	62.5	79.6	52.8
Physically inactive adults (%) (2020/21)[10]	-	-	-	-	-	-	-	36.7	23.1	28.0	23.4

Sources: Census 2011 (ONS, 2011); Census 2021 (ONS, 2021); Population Estimates (ONS, 2021); Local Health Profiles (Public Health England, 2016-21).

[17] Please note that ward level data for this indicator is unavailable from PHE.

6.16.10 If a change in a wider determinant of health is likely, it should be scoped into the human health assessment. The assessment must present the 'likely significant' human health effects of the Proposed Development. At the scoping stage, there are uncertainties, and there is limited insight into significance, therefore scoping identifies whether health effects are 'potentially significant' or not. Potentially significant human health effects are anticipated relating to the following determinants:

- physical activity;
- risk taking behaviour;
- open space, leisure, and play;
- transport modes, access, and connections;
- community safety;
- community identity, culture, resilience, and influence;
- social participation, interaction, and support;
- education and training;
- employment and income;
- climate change mitigation and adaptation;
- air quality;
- water quality or availability;
- land quality;
- noise and vibration;
- health and social care services;
- built environment; and
- wider societal infrastructure and resources.

6.16.11 The following determinants have been scoped out of the assessment as they're not relevant to the Proposed Development:

- diet and nutrition;
- housing;
- relocation; and
- radiation.

6.16.12 The following other ES chapters will inform the human health assessment:

- Chapter 8: Air Quality;
- Chapter 11: Noise and Vibration;
- Chapter 15: Traffic and Transportation;

- Chapter 18: Socio Economics and Land-Use; and
- Chapter 19: Climate Change.

6.16.13 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.17 Cumulative and Combined Effects

Cumulative Effects

6.17.1 In accordance with the EIA Regulations, consideration will also be given to the potential for cumulative effects to arise. Cumulative effects may occur when environmental effects associated with the Proposed Development interact with those associated with other planned projects and developments located in the vicinity.

6.17.2 The effects of the Proposed Development for each of the ES topics described above will therefore be considered in conjunction with the potential effects from other projects which are both reasonably foreseeable in terms of delivery (e.g., have planning consent) and are located within a relevant geographical scope where environmental impacts could act together to create a more significant overall effect, and reported within the ES.

6.17.3 A number of other proposed developments have been identified in the vicinity of the Proposed Development Site that could potentially result in cumulative effects during construction and operation of the Proposed Development. Those developments most likely to result in significant cumulative effects in combination with the Proposed Development are listed below and illustrated on Figure 15: Other Developments to be Considered in the Cumulative Impact Assessment (Appendix A). This is not an exhaustive list and will be developed further in the PEI Report.

6.17.4 The Applicant will consult with RCBC, STBC, HBC, and other neighbouring local authorities in order to define the full list of current and future developments/ projects to be considered.

HyGreen

6.17.5 HyGreen is another bp led project which is in the early stages of design and planning. HyGreen is a proposed green H_2 production facility, which is currently subject to further engineering and environmental studies likely to be located in close proximity to the Proposed Development Site. It is currently at pre-planning stage.

Net Zero Teesside

6.17.6 NZT is a proposed full chain CCUS project, comprising a CO_2 gathering network, including CO_2 pipeline connections from industrial facilities on Teesside to transport the captured CO_2; a CCGT electricity generating station with an abated capacity circa 860 megawatts output (gross), cooling water, gas and electricity grid connections and CO_2 capture; a CO_2 gathering/booster station to receive the captured CO_2 from the gathering network and CCGT generating station; and the onshore section of a CO_2 transport pipeline for the onward transport of the captured CO_2 to a suitable offshore geological storage site in the North Sea. The NZT Power, Capture and

Compressor (PCC) Site is proposed to be located to the immediate east of the Main Site for the Proposed Development.

6.17.7 The project will require a DCO to enable its construction and operation. The examination period closed on 10th November 2022 and the SoS decision is expected on 10th May 2023.

Tees Combined Cycle Power Plant (CCPP)

6.17.8 Tees CCPP is a proposed gas-fired combined cycle gas turbine (CCGT) power station with a maximum generating capacity of up to 1,700 MW. It is proposed on approximately 15 ha of land formerly used as a gas-fired generating station within the south-west part of the Wilton International Complex, to the south of the Proposed Development Site. The DCO application was approved in April 2019 but is understood to be undergoing an amendment to enable development of the Whitetail project – a proposed 300 MW power plant at Sembcorp Energy UK's Wilton International site, with CCS. It is expected that construction of the Tees CCPP will begin in 2024, with the generating station becoming operational in 2027.

York Potash Harbour Facilities

6.17.9 In July 2016, the SoS for Transport made the York Potash Harbour Facilities Order 2017 that came into effect in August 2017. The order authorised the installation of wharf/ jetty facilities with two ship loaders capable of loading bulk dry material at a rate of 12 million tonnes per annum (dry weight), as well as associated dredging operations, a storage building with conveyor to wharf/jetty and a materials handling facility with conveyor to storage building and jetty, to the south of Main Site A for the Proposed Development.

6.17.10 It forms part of the wider York Potash Project (now referred to as the Woodsmith Project) which includes the development of a new mine for the winning and working of the only known UK resource of polyhalite. The harbour facilities are required to enable the bulk export of polyhalite.

York Potash Material Handling Facility

6.17.11 In September 2014, York Potash Ltd submitted a planning application for a mineral (polyhalite) granulation and storage facility involving the construction of buildings, conveyor systems, substations, water treatment plant, internal access roads, car parking, attenuation ponds, landscaping, restoration and aftercare, and construction of a tunnel portal including the landforming of spoil and associated works. The development is located approximately 0.3 km to the south of Main Site A and adjacent to Main Site B. The application was granted in August 2015. Construction is currently underway.

MGT Teesside Tees Renewable Energy Plant (REP)

6.17.12 The Tees REP is a proposed 300 MW biomass fired renewable energy power station on land adjacent to the main southern dock at Teesside on the south bank of the River Tees, to the south-west of the Main Site A for the Proposed Development.

6.17.13 Construction of the project commenced in August 2016, but has experienced a number of delays, including a fire and a temporary suspension due to the Covid-19 pandemic. It is potentially going to be operational within the next 1-2 years.

Redcar Energy Centre (REC)

6.17.14 Redcar Energy Centre (REC) is a proposed a material recovery facility incorporating a bulk storage facility, an energy recovery facility, and an incinerator bottom ash recycling facility along with ancillary infrastructure and landscaping, located to the immediate west of the Main Site A for the Proposed Development. A planning application for REC was submitted in August 2020 and granted in January 2021; it was anticipated that construction would begin within approximately 15 months of the 187 decision date but as of March 2023 construction is yet to begin.

CBRE Anaerobic Biogas Production Facility

6.17.15 In July 2016, CBRE submitted a planning application for an anaerobic biogas production facility and CHP plant, southeast of the Main Site for the Proposed Development. This facility would involve the anaerobic digestion of mixed feedstock to create a biogas to be used as fuel in the CHP. Planning permission was granted in October 2016, but construction is yet to begin.

Tees Valley Lithium Project

6.17.16 In September 2022, Tees Valley Lithium Ltd submitted a planning application for the construction of a lithium hydroxide monohydrate manufacturing plant and ancillary development (the 'Tees Valley Lithium Project'), within Wilton International Estate, Redcar. Planning permission was granted in November 2022. The development is located within the Wilton International estate, south-east of Main Sites A and B. The development will be constructed on a phased basis and eventually comprise four process trains. Train 1 will employ a caustication process, whilst Trains 2, 3 and 4 will utilise an electrochemical process. It is anticipated that construction of Train 1 will be complete by Q4 2024, and construction of Trains 2, 3 and 4 will be complete by Q4 2025.

South Tees Development Corporation Projects

6.17.17 STDC have recently submitted a number of planning applications in the vicinity of the Proposed Development Site, primarily for demolition works and engineering operations associated with ground remediation and preparation for regeneration and development. They are also in the process of preparing a number of planning applications for development of general industry (Use Class B2) and storage or distribution facilities (Use Class B8) with office accommodation (Use Class E), HGV and car parking, works to watercourse including realignment and associated infrastructure works.

Offsite Hydrogen Storage

6.17.18 As identified in Section 3.9, off-site storage of H_2 is not included within the Proposed Development. Should there be the requirement for off-site storage, it is expected that these would be owned and operated by a third-party provider who would be responsible for any consenting requirements. Detail regarding this will be limited, with any potential developments being at pre-planning stage, but the potential for cumulative effects will be assessed at a high level, based on the information available at that time.

Combined Effects

6.17.19 Combined effects may occur where several different effects from a single development collectively cause an effect of greater or lesser significance upon a particular environmental receptor.

6.17.20 An assessment of potentially significant combined effects, considering each of the ES topics described above, will be undertaken, and reported in the ES.

7.0 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

7.1 EIA Methodology and Reporting

7.1.1 The ES will set out the process followed during the EIA including the methods used for the collection of data and for the identification and assessment of impacts. Any assumptions made will be clearly identified.

7.1.2 The EIA process is designed to be capable of, and sensitive to, changes that occur as a result of changes to the design, including any mitigation measures that are incorporated during the EIA. This will be particularly important for the Proposed Development as the design and layout is still being refined, and minor changes are likely to be made following submission of this EIA Scoping Report.

7.1.3 The EIA will be based on a number of related activities, as follows:

- establishing existing baseline conditions;
- consultation with statutory and non-statutory consultees throughout the Application process;
- consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to EIA;
- consideration of technical standards for the development of significance criteria;
- review of secondary information, previous environmental studies and publicly available information and databases;
- physical surveys and monitoring;
- desk-top studies;
- computer modelling;
- reference to current legislation and guidance; and
- specialist opinion.

7.1.4 Impacts will be considered on the basis of their magnitude, duration and reversibility. Cumulative and combined effects will also be considered where appropriate. Significance will be evaluated on the basis of the scale of the impact and the importance or sensitivity of the receptors, in accordance with standard assessment methodologies (major, moderate, minor and negligible). For the purpose of the EIA, moderate and major effects will be deemed 'significant'.

7.1.5 Where likely significant environmental effects are identified in the assessment process, measures to mitigate these effects will be recommended.

7.2 Structure of the Environmental Statement

7.2.1 The ES will address the direct effects of the Proposed Development in addition to the likely indirect, cumulative, short, medium and long term, permanent, temporary, beneficial and adverse effects. The mitigation measures envisaged in order to prevent, reduce or where possible offset significant adverse effects will also be

described. The concluding chapters will provide a summary of the cumulative and combined effects and likely significant residual environmental effects.

7.2.2 The ES will comprise the following set of documents:

- Non-Technical Summary (NTS): this document will provide a summary of the key issues and findings of the EIA in non-technical language;
- Volume I: ES: this will contain the full text of the EIA with the proposed Chapter headings as follows:
  - Introduction;
  - Assessment Methodology;
  - Description of the Existing Environment;
  - Proposed Development;
  - Construction Programme and Management;
  - Alternatives and Design Evolution;
  - Legislative and Planning Policy Context;
  - Air Quality;
  - Surface Water, Flood Risk and Water Resources;
  - Geology, Hydrogeology and Contaminated Land;
  - Noise and Vibration;
  - Ecology and Nature Conservation (including Aquatic Ecology);
  - Ornithology;
  - Marine Ecology and Nature Conservation;
  - Traffic and Transportation;
  - Landscape and Visual Amenity;
  - Cultural Heritage;
  - Socio Economics and Land-Use;
  - Climate Change;
  - Major Accidents and Disasters;
  - Materials and Waste;
  - Human Health;

  - Cumulative and Combined Effects; and
  - Summary of Significant Effects.

- Volume II: Technical Appendices: these will provide supplementary details of the environmental studies conducted during the EIA including relevant data tables, figures and photographs; and
- Volume III: Figures: Stand-alone figures volume containing all figures not included separately within the technical appendices.

7.3 Structure of Technical Chapters

7.3.1 The technical chapters (Volume I) will be structured based on the following sub-headings:

Introduction

7.3.2 The Introduction will describe the format of the assessment presented within the chapter.

Legislation and Planning Policy Context

7.3.3 The Legislation and Planning Policy Context section of the technical chapters will provide an overview of the relevant legislation, planning policy and technical guidance relevant to the assessment and how they have been applied.

Assessment Methodology and Significance Criteria

7.3.4 The methods used in undertaking the technical study will be outlined in this section with references to published standards (e.g., British Standards, Building Research Establishment), guidelines (e.g., DMRB and IEMA guidelines) and relevant significance criteria.

7.3.5 The significance of effects will be evaluated with reference to definitive standards, accepted criteria and legislation where available. Where it is not possible to quantify impacts, qualitative assessments will be carried out, based on available knowledge and professional judgment. Where uncertainty exists, this will be noted in the relevant technical assessment chapter.

7.3.6 Specific criteria for each technical assessment will be developed, giving due regard to the following:

- extent and magnitude of the impact;
- impact duration (whether short, medium or long term);
- impact nature (whether direct or indirect, reversible or irreversible);
- whether the impact occurs in isolation, is cumulative or interactive;
- performance against environmental quality standards where relevant;
- sensitivity of the receptor; and
- compatibility with environmental policies and standards.

7.3.7 For issues where definitive quality standards do not exist, significance will be based on the:

- local, district, regional or national scale or value of the resource affected;
- number of receptors affected; and
- sensitivity of these receptors; and duration of the impact.

7.3.8 The ES will clearly explain any assumptions that have been made in the assessments including definition of the maximum parameters used in accordance with the Rochdale Envelope approach.

7.3.9 In order to provide a consistent approach to expressing the outcomes of the various studies undertaken as part of the EIA, and thereby enable comparison between effects upon different environmental components, the following terminology will be used throughout the ES to define effects, unless technical chapters set out otherwise:

- adverse – detrimental or negative effect to an environmental resource or receptor; or
- beneficial – advantageous or positive effect to an environmental resource or receptor; and
- negligible – imperceptible effect to an environmental resource or receptor; or
- minor – slight, very short or highly localised effect of no significant consequence; or
- moderate – more than a slight, very short or localised effect (by extent, duration or magnitude) which may be considered significant; or
- major – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

Baseline Conditions

7.3.10 In order to assess the potential impacts and effects of the Proposed Development, it is necessary to determine the environmental conditions that currently exist on site and in the surrounding area, for comparison. These are known as the 'existing baseline conditions'. Baseline conditions are determined using the results of site surveys and investigations or desk-based data searches, or a combination of these, as appropriate.

7.3.11 'Future baseline conditions', which are the likely future conditions in the study area in the absence of the Proposed Development, will also be considered and described.

7.3.12 For the purposes of assessment, each chapter will identify a reasonable 'worst case scenario' with regards in relation to optionality within the Proposed Development and future baseline scenarios.

Development Design and Impact Avoidance

7.3.13 Measures that have been integrated into the Proposed Development in order to avoid or reduce adverse environmental effects will be described. Such measures may include refinement of the design and layout of the Proposed Development to avoid impacts on sensitive receptors, implementation of a CEMP, and adherence of relevant legislation, guidance and best practice. The assessment of impacts and effects will take account of these measures already being in place.

Likely Impacts and Effects

7.3.14 This section will identify the likely impacts resulting from the Proposed Development inclusive of the design measures discussed above. The magnitude of impacts is defined with reference to the relevant baseline conditions (existing or future, as appropriate), and effects are determined in accordance with the identified methodology.

Mitigation and Enhancement Measures

7.3.15 The Mitigation and Enhancement Measures section will describe the measures that will be implemented by the Applicant to reduce any significant adverse effects identified by the assessment and enhance beneficial effects during construction and operation of the Proposed Development over and above those already included as development design and impact avoidance measures.

Limitations or Difficulties

7.3.16 Where in any case it is not possible to quantify effects, qualitative assessments will be undertaken, based on available knowledge and professional judgment. Where any uncertainty exists, this will be clearly outlined in the limitations section of each of the impact assessments chapters. The limitations presented by this uncertainty will be taken into account in defining the reasonable worst-case scenario for the topic assessments.

Cumulative Effects

7.3.17 In accordance with the EIA Regulations, consideration will be given to the potential for cumulative effects to arise as a result of the Proposed Development.

Residual Effects and Conclusions

7.3.18 Effects of the Proposed Development remaining following the implementation of available mitigation measures are known as 'residual effects'. These will be discussed for each of the potential effects, and their significance level identified.

7.4 Consultation on the EIA

7.4.1 The process of consultation is critical to the development of a comprehensive and balanced ES. The views of statutory and non-statutory consultees serve to focus the environmental studies and to identify specific issues that require further investigation. Consultation is an ongoing process, which enables mitigation

measures to be incorporated into the Proposed Development's design, thereby limiting adverse effects and enhancing environmental benefits.

7.4.2 To date, introductory meetings have been held with Natural England (16th September 2022) and the Environment Agency (4th October 2022). The purpose of these meetings was to introduce the Proposed Development, provide an overview of the programme as and discuss matters which the Applicant will be seeking input from both Natural England and the Environment Agency on, under their respective Discretionary Advice Services (DAS's). Table 7-1, summarises the outcome of these discussions to date.

Table 7-1: Consultation Undertaken to Date of relevance to the EIA

CONSULTEE	SUMMARY OF OUTCOME OF DISCUSSIONS	APPLICANT'S RESPONSE
Natural England	**Introductory Meeting September 16th, 2022 (Virtual Microsoft Teams)** A meeting was held to provide Natural England with an introduction to the Proposed Development and agree what services the Applicant would seek as part of Natural England's DAS service. Natural England noted that they were unable to provide detailed advice regarding the proposed routing. Natural England did however acknowledge that the proposed pipelines would cross the Teesmouth & Cleveland Coast SSSI, SPA & Ramsar Site, either above or below ground. Natural England have requested further detail regarding the construction phase methodology for the route options route, in order to provide a view as to whether or not the proposed works would have an adverse effect upon the site. **Advice sought via the DAS service (written) 9th December 2022** Further information on the proposals were provided to Natural England including further information on construction methodologies.	The Applicant provided further information in response to Natural England's request (see below). Further consultation will be required on various matters under the DAS throughout the application process. Natural England provided high level comments on the information presented to them.
Environment Agency	**Introductory Meeting October 4th, 2022 (Virtual Microsoft Teams)** A meeting was held to provide the Environment Agency with an introduction to the Proposed Development and agree what advice services the Applicant would seek from the Environment Agency under their DAS service.	The Environment Agency's comments are being considered, and the feasibility of the suggestions assessed as part of the design process.

CONSULTEE	SUMMARY OF OUTCOME OF DISCUSSIONS	APPLICANT'S RESPONSE
	The Environment Agency raised some specific points in relation to the proposals at the time of the introductory call. These included in summary: – Some of the proposed pipeline route corridors and interactions with other developments in the area including likely future works to the Greenabella Seawall defences, and especially around the Greatham Area to the west of the Proposed Development Site. – Some of the proposed pipeline route corridors interface with the EA's assets especially flood defences in the Greatham area.	

7.4.3 Consultation on the Proposed Development will be undertaken in Summer 2023. It will utilise a range of methods, including a project website, to provide up-to-date information and aid consultation with key stakeholders.

7.4.4 As required by Section 47 of the Planning Act 2008 (as amended), the Applicant is preparing a Statement of Community Consultation (SoCC). The SoCC will outline how the Applicant intends to formally consult with the local community about the Proposed Development. The Applicant is required to first consult the relevant local authorities on the draft SoCC, who have a period of at least 28 days following receipt of the draft SoCC to do so, prior to its publication for inspection by the public.

7.4.5 PEI in the form of a PEI Report will be provided for statutory consultation, which is likely to be undertaken in Summer 2023. The statutory consultation will use a range of methods, including the distribution of digital and printed consultation materials, face to face and virtual public events, an online virtual consultation room and postal notifications to those living within a defined zone around the Proposed Development Site, alongside document inspection venues, newspaper notices and letters to statutory consultees as required by sections 47, 48 and 42 of the Planning Act 2008.

7.4.6 All responses received during consultation will be carefully considered and taken into account as the design and EIA of the Proposed Development progresses, in accordance with Section 49 of the Planning Act 2008. Details of any responses received during consultation and the account taken of those responses will be included in a Consultation Report, as required by Section 37 of the Planning Act 2008.

7.4.7 This Consultation Report will be submitted as part of the application for development consent and will be available for public review at that point. The Consultation Report will demonstrate how the Applicant has complied with the statutory consultation requirements of the Planning Act 2008. It will be considered by PINS, both when determining whether to accept the application and in examining the application.

7.5 Transboundary Effects

7.5.1 On the basis of the information outlined within this scoping report and having regard to the location and spatial scope of the assessments is it considered that the Proposed Development is not likely to have a significant effect either alone or cumulatively on the environment in any European Economic Area (EEA) state due to the distance of the site from potential EEA receptors.

8.0 SUMMARY AND MATTERS TO BE SCOPED OUT

8.1 Matters Scoped Into the EIA

8.1.1 This Request for a Scoping Opinion has identified the potential for significant environmental effects to arise from the construction (including maintenance where relevant), operation and decommissioning of the Proposed Development. The following specialist assessments for inclusion in the EIA are proposed:

- Air Quality;
- Surface Water, Flood Risk and Water Resources;
- Geology, Hydrogeology and Contaminated Land;
- Noise and Vibration;
- Ecology and Nature Conservation (including Aquatic Ecology);
- Ornithology;
- Marine Ecology and Nature Conservation;
- Traffic and Transportation;
- Landscape and Visual Amenity;
- Cultural Heritage;
- Socio Economics and Land-Use;
- Climate Change;
- Major Accidents and Disasters;
- Materials and Waste; and
- Human Health.

8.1.2 The detailed assessments for each of these topics will be undertaken in accordance with standard guidance and best practice and reported in the ES. Where significant effects are identified, mitigation measures will be described where possible to reduce the residual effects.

8.2 Other Matters Proposed for Scoping Out of the EIA

8.2.1 Where specific matters have been scoped out of the assessments included in Section 7 this has been outlined within those sections and has not been repeated here.

8.2.2 Other matters not included elsewhere are outlined in brief below.

Electronic Interference

8.2.3 It is unlikely that the maximum building heights for any buildings proposed, and temporary construction cranes would not be significantly higher than other structures recently located in the vicinity of the Proposed Development (as a former steelworks) or associated with the proposed NZT development. In addition, there are no nearby residential properties likely to be affected. Effects from Electromagnetic

Fields (EMF) where they relate to human health will be considered and included in brief within the proposed Human Health Chapter once further information on the electrical connections is known.

8.2.4 Therefore, a standalone assessment of the Proposed Development's effect on electronic interference is not considered to be required.

8.2.5 Further to this, analogue signals have ceased to be transmitted and have been replaced by digital signals. As such, the Proposed Development's potential to interfere with television, radio (both analogue and digital) and mobile phone reception is considered negligible.

Aviation

8.2.6 It is proposed to scope out impacts on aviation based on the likely maximum height of the flare and other buildings associated with the Proposed Development. In general, it is considered that in the context of the surrounding industrial facilitates these are anticipated to be comparable to the heights of structures that have previously occupied the site at Redcar Steel works.

8.2.7 The Civil Aviation Authority (CAA) will be consulted on the Proposed Development to review any requirements for aviation lighting on the stack(s)and enable the Proposed Development to be charted in future. Should infrastructure or cranes be required which are taller than those currently expected, the need for an aviation assessment will be reviewed accordingly.

9.0 REFERENCES

9.1.1 Below is the full list of reference documents for the EIA Scoping Report, using the Harvard style (to the best of available information). References are listed in order of alphabetical by (lead) author's surname or publishing organisation (or title for legislation only), then chronological with oldest first, and then finally by order of appearance within the Report as indicated by letter following the date.

- AECOM (2021). Net Zero Teesside Environmental Statement [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/projects/north-east/the-net-zero-teesside-project/?ipcsection=docs.
- Bat Conservation Trust (2022). *Interim Guidance Note: Use of night vision aids for bat emergence surveys and further comment on dawn surveys* [online]. Available at: https://cdn.bats.org.uk/uploads/pdf/Interim-guidance-note-on-NVAs-May-2022-FINAL.pdf?v=1653399882.
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APPENDIX A: FIGURES

APPENDIX B: LONG LIST OF MA&D CATEGORIES AND SCOPING STATUS

Table B-1: Long List of Major Accident & Disaster Hazard Categories, and Scoping Status, with Commentary

HAZARD	SCOPED IN (Y/N)	COMMENTARY
Construction Hazards		
Accident Impact/ Structural Collapse/ Utility Strike/ UXO	Y	Construction hazards can include events which have the potential for harm, including fatal injuries to workers. These include the collapse of buildings, structures and excavations, vehicle accidents, contact with HV transmission cables (overhead and buried), contact with underground utility services and UXO. This category is scoped in for further assessment.
Release of Ground Contamination	Y	Preparatory work during construction could encounter significant quantities of contaminated ground due to historic industrial use. If this material is accidentally released to the environment, there is the potential for harm. This category is scoped in for further assessment.
Operational Process Hazards		
Fire	Y	The accidental release of flammable substances could result in a fire if immediately ignited. This could result in harm to people onsite and potentially offsite. This category is scoped in for further assessment.
Explosion	Y	The accidental release of flammable substances could result in an explosion if the gas accumulates prior to ignition. This could result in significant harm to people onsite and potentially offsite. This category is scoped in for further assessment.
Toxic gas release	Y	The accidental release of syngas containing CO could result in a toxic hazard with harm to people onsite. It is unlikely that this could have an impact offsite but is scoped in for further assessment.
Asphyxiant gas release	Y	A significant release of CO_2 could result in harm to people onsite and potentially offsite therefore is scoped in for further assessment.
Environmentally harmful liquid release	N	A release of aqueous ammonia or diesel which reached environmental receptors could have an impact, however the quantity present on site will likely be relatively small and impact would not reach the criteria for a MA&D therefore is scoped out.
Domino Event	Y	A major incident occurring at a site which is part of the Teesside cluster of major hazard sites could escalate and cause an impact at the Production Facility at the Main Site. Conversely, a major incident could have an impact on neighbouring facilities. Domino effects are therefore scoped in for further assessment.

HAZARD	SCOPED IN (Y/N)	COMMENTARY
Operational Transportation Hazards		
Road traffic accident (dangerous goods)	N	Collisions/ accidents involving road tankers delivering materials to site could result in a loss of containment of diesel and aqueous ammonia. The quantity of these materials would be contained within drainage systems and unlikely to result in a major accident, therefore this category is scoped out.
Marine accident	N	The primary process materials will be transported to and from the site via pipeline, therefore marine transport is not applicable, and this category is scoped out.
Other Industrial Hazards		
Electrical failure	N	During operation, electrical failure or power loss can be caused by supply issues or disruption to infrastructure. Process equipment and instrumentation would be designed to fail to a safe condition and the Proposed Development will include installation of back-up power generation and uninterruptable power supplies (UPS). In an emergency event where all power supplies are lost, a flare will be provided for the safe disposal of gas, consequently this scenario is scoped out.
System / utilities failures	N	Disruption to water supplies and effluent disposal may have an impact on process operations however are unlikely to cause harm to the environment as this would be considered within the design of the facility and the appropriate safety systems installed. Consequently, this scenario is scoped out.
Meteorological Hazards		
High windspeed	N	There is a low probability of a hurricane force event occurring at the Production Facility, however major storms and gales could result in damage due to infrastructure. Storms will be considered during the engineering design of buildings and structures and the appropriate engineering standards used, therefore this category is scoped out.
Low temperatures and heavy snow.	N	The climate in the north-east of England is typically mild. In the event of extreme, prolonged low temperatures and snowfall, there is the potential for snow loading on buildings and freezing liquids in pipework. Operations are unlikely to be interrupted however as these potential issues will be considered within the engineering design and appropriate insulation used. This category is therefore scoped out.
High temperatures / heatwave	N	In the event of a prolonged period of hot weather there is the potential for an impact to temperature sensitive equipment such as process cooling systems and electrical switchgear. This could cause an

HAZARD	SCOPED IN (Y/N)	COMMENTARY
		operational upset but is unlikely to cause harm. These issues will be incorporated within the engineering design and therefore this category is scoped out.
Drought	N	The Proposed Development is not expected to be vulnerable to drought conditions, as there is a low risk of interruptions to the supplies of water in this location therefore this category is scoped out.
Electrical storms	N	Lightning could result in damage to the Proposed Development as a result of a direct strike to buildings or structures. There is also the potential for lightning to act as a source of ignition if damage occurred during the storm causing a loss of containment of flammable gases. Design engineering standards to be incorporated by the Proposed Development for the provision of lighting protection systems on buildings and structures are well established. Consequently, this category is scoped out.
Geophysical Hazards		
Earthquake	N	There is a low record of seismic activity observed at the location of the Proposed Development and severe damage is unlikely, therefore this category is scoped out.
Ground stability	N	Groundworks carried out prior to construction will provide a stable site at the Production Facility and within pipeline connection corridors (where required for new pipelines) prior to construction. The Teesside area has a low risk of landslides, ground collapse, ground compression, or sinkholes associated with site geology, therefore this category is scoped out.
Hydrological Hazards		
Coastal Flood	Y	The Production Facility site is located by the North Sea coast with parts in Flood Zone 3 (greater than 0.5% AEP sea flooding). The risk will be considered within the stand-alone FRA and summarised within the Surface Water, Flood Risk and Water Resources chapter . This is considered a credible MA&D scenario, therefore scoped in for further assessment.
Fluvial Flood	Y	Site is on the River Tees with parts in Flood Zone 3 (greater than 1% AEP river flooding). The risk will be considered within the stand-alone FRA and summarised assessed within the Surface Water, Flood Risk and Water Resources chapter. This is considered a credible MA&D scenario, therefore scoped in for further assessment.
Pluvial Flood	Y	Parts of the site has a low risk (between 0.1% and 1% flood risk from surface water). The risk will be considered within the stand-alone FRA and

HAZARD	SCOPED IN (Y/N)	COMMENTARY
		summarised assessed within the Surface Water, Flood Risk and Water Resources chapter. This is considered a credible MA&D scenario, therefore scoped in for further assessment.
Groundwater Flood	Y	The groundwater vulnerability map places the area of the site at Medium-High risk. This risk will be assessed within the Surface Water, Flood Risk and Water Resources chapter and is considered a credible MA&D scenario, therefore scoped in for further assessment.
Other Natural Hazards		
Poor air quality	N	Pollution episodes are known to occur in the UK but the Proposed Development is not expected to be particularly vulnerable this hazard. The development will not contribute significantly to road transport pollution in the area. Air intakes for combustion equipment will be fitted with the appropriate filtration systems to prevent damage from poor air quality. Emissions from combustion equipment will assessed for the purposes of the EIA within the Air Quality assessment and will be controlled and regulated in accordance with an environmental permit. No MA&D scenarios have been identified therefore this category has been screened out for further assessment.
Wildfires	N	Severe wildfires are infrequent in the UK and the Proposed Development is not located in an environment particularly vulnerable to wildfire, being primarily urban/industrial therefore this category has been screened out for further assessment.
Societal Hazards		
Malicious attacks	N	Malicious attack could include intentional violence to people, arson or other methods of destruction of property, cyber-attacks, or chemical, biological, or nuclear attacks by terrorists or other actors. These events have been known to occur at infrastructure sites in the UK. However, these risks will be mitigated at the national level as a matter of national security.

The Planning Inspectorate
Yr Arolygiaeth Gynllunio

SCOPING OPINION:

Proposed H2Teesside Project

Case Reference: EN070009

Adopted by the Planning Inspectorate (on behalf of the Secretary of State) pursuant to Regulation 10 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

17 May 2023

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1. INTRODUCTION

1.0.1 On 06 April 2023, the Planning Inspectorate (the Inspectorate) received an application for a Scoping Opinion from H2 Teesside Limited (the Applicant) under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) for the proposed H2Teesside Project (the Proposed Development). The Applicant notified the Secretary of State (SoS) under Regulation 8(1)(b) of those regulations that they propose to provide an Environmental Statement (ES) in respect of the Proposed Development and by virtue of Regulation 6(2)(a), the Proposed Development is 'EIA development'.

1.0.2 The Applicant provided the necessary information to inform a request under EIA Regulation 10(3) in the form of a Scoping Report, available from:

http://infrastructure.planninginspectorate.gov.uk/document/EN070009-000037

1.0.3 This document is the Scoping Opinion (the Opinion) adopted by the Inspectorate on behalf of the SoS. This Opinion is made on the basis of the information provided in the Scoping Report, reflecting the Proposed Development as currently described by the Applicant. This Opinion should be read in conjunction with the Applicant's Scoping Report.

1.0.4 The Inspectorate has set out in the following sections of this Opinion where it has / has not agreed to scope out certain aspects / matters on the basis of the information provided as part of the Scoping Report. The Inspectorate is content that the receipt of this Scoping Opinion should not prevent the Applicant from subsequently agreeing with the relevant consultation bodies to scope such aspects / matters out of the ES, where further evidence has been provided to justify this approach. However, in order to demonstrate that the aspects / matters have been appropriately addressed, the ES should explain the reasoning for scoping them out and justify the approach taken.

1.0.5 Before adopting this Opinion, the Inspectorate has consulted the 'consultation bodies' listed in Appendix 1 in accordance with EIA Regulation 10(6). A list of those consultation bodies who replied within the statutory timeframe (along with copies of their comments) is provided in Appendix 2. These comments have been taken into account in the preparation of this Opinion.

1.0.6 The Inspectorate has published a series of advice notes on the National Infrastructure Planning website, including Advice Note 7: *Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping* (AN7). AN7 and its annexes provide guidance on EIA processes during the pre-application stages and advice to support applicants in the preparation of their ES.

1.0.7 Applicants should have particular regard to the standing advice in AN7, alongside other advice notes on the Planning Act 2008 (PA2008) process, available from:

https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/

1.0.8 This Opinion should not be construed as implying that the Inspectorate agrees with the information or comments provided by the Applicant in their request for an opinion from the Inspectorate. In particular, comments from the Inspectorate in this Opinion are without prejudice to any later decisions taken (e.g. on formal submission of the application) that any development identified by the Applicant is necessarily to be treated as part of a Nationally Significant Infrastructure Project (NSIP) or Associated Development or development that does not require development consent.

2. OVERARCHING COMMENTS

2.1 Description of the Proposed Development

(Scoping Report Sections 2.0 and 3.0)

ID	Ref	Description	Inspectorate's comments
2.1.1	1.3.2	CO_2 export via Northern Endurance Partnership (NEP) infrastructure	The Scoping Report states that CO_2 from the Proposed Development would be exported to an offshore facility via NEP infrastructure on the adjacent Net Zero Teesside (NZT) site. NZT development consent order (DCO) application was due to be determined by the Secretary of State on 10 May 2023 but the Inspectorate notes that a new deadline of no later than 14 September 2023 was set on 9 May 2023. The ES should clearly describe the relationship between the Proposed Development and any connected projects including the offshore CO_2 facility. This should include the extent to which the Proposed Development is dependent on their delivery and the development timelines of the other projects, with an explanation of how these will be coordinated.
2.1.2	2.1.2 and Sections 3.1 and 3.2	Natural resources	The Scoping Report states that natural gas, oxygen (O_2), nitrogen (N_2) and water will be required for the operational phase of the Proposed Development. Paragraph 2.1.2 states that O_2 and N_2 will be from local sources; an alternative option for O_2 and N_2 supply from an air separation unit (ASU) is also identified (paragraph 3.1.1). The ES should include an estimate of the likely volume of the different natural resources, including those identified above, that will be required in the operation of the Proposed Development, how these will be transported to the site, and an assessment of any likely significant effects arising from the use of such resources.

ID	Ref	Description	Inspectorate's comments
2.1.3	3.1.5	Carbon capture	The Scoping Report states that CO_2 would be captured at a rate in excess of 95%, which is anticipated to be secured through an environmental permit. Should the draft DCO (dDCO) allow for the generating station component to operate independently of the carbon capture, a worst case assessment of likely significant effects should be undertaken. If assessments in the ES rely on a capture rate of 95% it should be clear how this would be secured in the dDCO.
2.1.4	3.1.7 to 3.1.8 and Sections 3.2 to 3.8	Flexibility	The Inspectorate notes the Applicant's desire to incorporate flexibility into their dDCO and its intention to apply a 'Rochdale Envelope' approach for this purpose. This includes options for the various required connection corridors required as part of the project, eg CO_2 export, hydrogen, natural gas, electrical and water connection. Paragraph 3.1.7 states that it is expected that optionality would be reduced, and preferred options confirmed prior to submission of an application. Paragraph 3.1.8 describes that some aspects and features will not be confirmed until an engineering, procurement and construction contractor has been appointed, ie post grant of any DCO. In this instance, it is stated that the Rochdale Envelope will be adopted to define appropriate parameters for use in the EIA. The Applicant should make every attempt to narrow the range of options and explain clearly in the ES which elements of the Proposed Development have yet to be finalised and provide the reasons. At the time of application, any Proposed Development parameters should not be so wide-ranging as to represent effectively different developments. The parameters should use the maximum envelope within which the built development may be undertaken to ensure a worst case assessment. The ES should identify the parameters that have been assumed as the worst case scenario for each aspect scoped in to the assessment and ensure that interactions between aspects are taken into account relevant to those scenarios.

ID	Ref	Description	Inspectorate's comments
			The development parameters should be clearly defined in the dDCO and in the accompanying ES. The Applicant, in preparing an ES, should consider whether it is possible to robustly assess a range of impacts resulting from a large number of undecided parameters. The description of the Proposed Development in the ES must not be so wide that it is insufficiently certain to comply with the requirements of Regulation 14 of the EIA Regulations. The Inspectorate draws the Applicant's attention to Advice Note 9: Rochdale Envelope, which states that *"it will be for the authority responsible for issuing the development consent to decide whether it is satisfied, given the nature of the project in question, that it has 'full knowledge' of its likely significant effects on the environment."* Please also note the Inspectorate's comments regarding alternatives at ID 2.1.17 of this Scoping Opinion. It should be noted that if the Proposed Development materially changes prior to submission of the DCO application, the Applicant may wish to consider requesting a new scoping opinion.
2.1.5	3.1.1 and Table 3-2	Phasing	The Scoping Report states that the Proposed Development would be phased, with a total design capacity of 1.2 gigawatt (GW) thermal for hydrogen production facility across two phases of up to 600 megawatt (MW) thermal in each phase. Table 3-2 of the Scoping Report provides an indicative construction timeline, with Phase 1 commencing mid-2025 and lasting approximately 2 years and Phase 2 commencing late 2027/ early 2028 and lasting 2-3 years. The ES should include an assessment of any likely significant effects arising from the phased nature of the Proposed Development, including risks of major accidents from the proximity of construction activity to the operational hydrogen production plant. Measures required to mitigate any significant effects should be clearly described in drafts of the construction environmental management plan (CEMP)

ID	Ref	Description	Inspectorate's comments
			and/ or operational environmental management plan (OEMP) submitted with the application.
2.1.6	Section 3.2	Hydrogen production facility built parameters	Section 3.2 of the Scoping Report describes the above ground infrastructure that is likely to be required as part of the hydrogen production facility but does not specify any built parameters. The ES should confirm the final parameters (minimum and maximum height, width, length and depth) and location of each component of above ground infrastructure and assess any likely significant effects resulting from their construction, operation/ maintenance, or decommissioning.
2.1.7	Sections 3.3 to 3.8	Construction working width and pipeline trenches	The ES should define the applicable parameters for the construction working width and the pipeline trenches, including depth, or apply a worse case. It should be clear how these parameters are secured through the dDCO. Where significant effects are identified the ES should set out the mitigation proposed to avoid, reduce or offset such effects including where appropriate the specification of construction methods and / or limitations placed on construction activities, and how this would be secured. The Applicant's attention is drawn to the Environment Agency's (EA) comments in Appendix 2 regarding pipeline design.
2.1.8	Sections 3.4 to 3.8 and Table 3-2	Special crossings	The Scoping Report outlines that a range of crossing methodologies are under consideration for the natural gas supply and hydrogen pipeline corridors. This could include open cut and/ or trenchless methodologies depending on engineering and environmental constraints. The ES should confirm the minimum and maximum depths of the crossings. The ES should clarify whether it is intended to adopt a similar approach in respect of any below ground routeing for the electrical, water and other gases connections.

ID	Ref	Description	Inspectorate's comments
			Table 3-1 of the Scoping Report confirms that only trenchless techniques are being considered for crossings of the River Tees and horizontal directional drilling (HDD) or use of existing pipeline for Greatham Creek. The Inspectorate welcomes the use of trenchless techniques in environmentally sensitive areas but notes that trenchless techniques have different land requirements; the full range of environmental effects should be considered when determining a preferred construction method. The ES should confirm the crossing methodologies assumed for each connection corridor. If flexibility is sought regarding the use of open cut or trenchless techniques, the ES should assess the available options or identify and assess a worst case scenario as relevant to each aspect and identify relevant mitigation, and how this would be secured. The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding construction methodologies, including those affecting existing flood defences.
2.1.9	Section 3.6	Electrical connection corridor	The Scoping Report states that in addition to on-site electricity generated from the Steam Turbine Generator, an alternative supply will be required with options under consideration. Paragraph 3.6.4 of the Scoping Report states that the electrical connection could be above or below ground or a combination. The ES should confirm the final parameters for the selected electrical connection. If above ground, this should include the maximum number, height and locations of any pylons, and length of overhead line. The assessment of likely significant effects should take account of this infrastructure alongside the plan and other associated infrastructure.

ID	Ref	Description	Inspectorate's comments
2.1.10	Section 3.11	Construction access	The ES should identify the locations of access routes to site for construction and maintenance of the connection corridors. Any likely significant effects resulting from their construction, operation and decommissioning should be assessed.
2.1.11	Section 3.11	Construction deliveries	The Scoping Report indicates that options are being explored for construction materials to be delivered by boat and/ or rail. The ES should include an assessment of the worst case allowed for in the dDCO.
2.1.12	3.11.5	Temporary working areas and construction compounds	The ES should identify the location and size of the temporary working areas for the connection corridors, as well as the temporary construction compounds. Any likely significant effects resulting from their use should be assessed.
2.1.13	Section 3.12	Site clearance and remediation	The Scoping Report states that site clearance and remediation of Main Site A would be carried out by Teesworks under a separate consent. It is therefore not proposed to assess this within the ES. The ES should make clear the scope and status of the consent for site remediation, as well as the timescales for the works, and a clear description of how and at what point the baseline has been defined for the purpose of assessment. For Main Site B these powers would be sought within the DCO application, and an assessment is proposed within the ES, should this site be selected. The ES should include an assessment of any likely significant effects arising from site clearance and remediation works, for which powers are sought within the dDCO and confirm how this is to be secured. The ES should include information about works required to facilitate development that is proposed outside of the DCO application,

ID	Ref	Description	Inspectorate's comments
			including their scope and extent, status of any relevant consents required, timescales and degree of certainty.
2.1.14	3.13.7	Waste	In order to inform a robust assessment of likely significant effects, the ES should provide information on the storage, management and disposal of waste, including tunnel arisings. Any assumptions in this regard, for example traffic movements, waste handling and contaminated land, should be clearly stated in the ES.
2.1.15	3.16.1	Lighting	In addition to operational lighting, the ES should clearly describe the location and design of lighting required along the construction working widths and at construction compounds. Any likely significant effects should be assessed.
2.1.16	3.18.2	Decommissioning	The ES assessment of impacts resulting from decommissioning should be proportionate but include a description of the process and methods of decommissioning, land use requirements and estimated timescales. A description of any assumptions made in the assessment, eg about the approach to retention or removal of pipelines, should be provided. Any decommissioning associated with dismantling and replacing elements of the Proposed Development once they reach the end of their design life should be assessed if significant effects are likely to occur. The Inspectorate notes paragraph 4.2.3 of the overarching NPS for Energy (NPS EN-1), which states that the ES should cover the environmental effects arising from decommissioning of the project.
2.1.17	Chapter 4	Alternatives	The Scoping Report identifies that several alternative options are under consideration, including two sites (Main Site A and Main Site B) for the hydrogen production plant. Paragraph 4.3.7 of the Scoping Report states that if alternatives still exist at the time of application, the ES will consider and assess the worst case impacts.

ID	Ref	Description	Inspectorate's comments
			The Inspectorate's comments at ID 2.1.4 about flexibility apply equally to alternatives. For the avoidance of doubt, the ES should consider the worst case impacts and identify mitigation as required for any options that are sought within the dDCO.
2.1.18	N/A	Easements	The description of the physical characteristics of the Proposed Development in the ES should include the details of required easements, to ensure that the extent of the likely impacts from the Proposed Development (for example, sterilisation of mineral resource) is fully understood.
2.1.19	N/A	Hydrogen pipeline safety criteria	The ES should explain what design guidelines and safety criteria are being followed for the hydrogen pipeline, and how any health and safety risks would be managed during operation/ maintenance. The Inspectorate notes that hydrogen is an emerging technology and that the regulatory framework and standards are likely to continue to evolve. Please also refer to the Inspectorate's comments at ID 3.13.3 of this Scoping Opinion.

2.2 EIA Methodology and Scope of Assessment

(Scoping Report Section 7.0)

ID	Ref	Description	Inspectorate's comments
2.2.1	7.3.4	Assessment methodology and significance criteria	The Scoping Report states that methods used in assessment will be outlined in each aspect chapter by reference to published standards, guidelines, and criteria. For some aspect sections in the Scoping Report, no reference is made to the standards proposed to be used so the Inspectorate is not able to provide substantive comment. The ES should describe the standards and guidelines used for each aspect and explain why these are appropriate to the assessment.
2.2.2	7.3.10	Baseline conditions	The Inspectorate notes that Main Sites A and B appear to partially overlap with the Order Limits of the NZT project. Any implications for the future baseline arising in the event of commencement of development authorised by the NZT DCO, should it be made, should be described in the ES.
2.2.3	Section 7.5	Transboundary	The Inspectorate on behalf of the SoS has considered the Proposed Development and concludes that the Proposed Development is unlikely to have a significant effect either alone or cumulatively on the environment in a European Economic Area State. In reaching this conclusion the Inspectorate has identified and considered the Proposed Development's likely impacts including consideration of potential pathways and the extent, magnitude, probability, duration, frequency and reversibility of the impacts. The Inspectorate considers that the likelihood of transboundary effects resulting from the Proposed Development is so low that it does not warrant the issue of a detailed transboundary screening. However, this position will remain under review and will have regard

ID	Ref	Description	Inspectorate's comments
			to any new or materially different information coming to light which may alter that decision. Note: The SoS' duty under Regulation 32 of the 2017 EIA Regulations continues throughout the application process. The Inspectorate's screening of transboundary issues is based on the relevant considerations specified in the Annex to its Advice Note Twelve, available on our website at http://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/
2.2.4	N/A	Study areas	Each ES aspect chapter should describe the study area used in the assessment. It should explain how the extent of the study area has been established by reference to guidelines and discussions with statutory consultation bodies as relevant. The ES should include a figure/ figures to identify the final study areas for each aspect, including the location of receptors considered.
2.2.5	N/A	Matters scoped into the assessment	For the avoidance of doubt, as there is no summary table identifying matters scoped in or out of the aspects listed below, this Scoping Opinion is adopted on the basis that the impacts on receptors listed at the specified paragraphs in the Scoping Report are scoped into the assessment subject to the Inspectorate's comments at 1.0.4: ▪ Surface water, flood risk and water resources – paragraph 6.3.20. ▪ Geology, hydrogeology and contaminated land – paragraph 6.4.88. ▪ Ecology and nature conservation – paragraph 6.6.18. ▪ Marine ecology – paragraph 6.8.24. ▪ Traffic and transportation – paragraph 6.9.10. ▪ Landscape and visual amenity – paragraph 6.10.8.

ID	Ref	Description	Inspectorate's comments
			▪ Cultural heritage – paragraph 6.11.10. ▪ Socio-economics and land use – paragraph 6.12.21. ▪ Climate change – paragraph 6.13.15. ▪ Materials and waste – paragraph 6.15.7.
2.2.6	N/A	Impacts from dewatering	The Scoping Report does not specify if dewatering would be required in the construction of the Proposed Development. The ES should describe the likely need for dewatering, identify sensitive receptors which may be affected and assess any likely significant effects. The ES and associated management plan documents should set out the minimum environmental requirements that have been assessed and that contractors will be required to apply when managing dewatering discharges.
2.2.7	N/A	CEMP	The Inspectorate welcomes the commitment to submit a framework CEMP with the ES. In addition to the matters listed at paragraph 3.13.7 of the Scoping Report, the Inspectorate advises that the framework CEMP should contain details of all measures referred to in the ES required to mitigate construction impacts, unless these are secured by alternative mechanisms (in which case this should be explained and the alternative mechanism confirmed). The ES should clearly describe the efficacy of proposed measures and any residual effects following implementation, and it should also assess any inter-related effects of the mitigation measures, eg the presence of any noise screening required to be considered in landscape and visual impact assessment.
2.2.8	N/A	Operational environmental management plan (OEMP)	The Scoping Report references use of an environmental management plan during operation to mitigate potential significant adverse effects. The Applicant should provide a draft/ outline version of an OEMP

ID	Ref	Description	Inspectorate's comments
			containing details of any measures referred to in the ES and demonstrate how these will be secured through the dDCO or an alternative legal mechanism.
2.2.9	N/A	Avoidance/ mitigation measures	The Scoping Report makes reference to the use of avoidance measures to reduce effects to not significant eg avoidance of tree / linear habitat feature removal. The ES should set out any measures relied upon to avoid significant effects and demonstrate how these will be secured through the dDCO or other legal mechanism.
2.2.10	N/A	Monitoring	The Scoping Report references monitoring of mitigation in several aspect sections. Where the ES concludes that monitoring is required, the Applicant should provide a document that describes the monitoring activities, who has responsibility for them, frequency, any trigger points for remedial action and how it is secured through the dDCO or other legal mechanism.

3. ENVIRONMENTAL ASPECT COMMENTS

3.1 Air Quality

(Scoping Report Section 6.2)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.1.1	6.2.14	Operational road traffic emissions	The Scoping Report identifies that operational traffic flows will be below the screening criteria of 500 Light Duty Vehicles or 100 Heavy Duty Vehicles per day, as set out in the Institute of Air Quality Management (IAQM) guidance published in 2017 and therefore seeks to scope out operational road traffic emissions. The Inspectorate agrees that providing traffic flows are confirmed as being less than the IAQM criteria for detailed assessment, this matter can be scoped out. The ES should also demonstrate that cumulative vehicle movements with other developments would not exceed the IAQM thresholds based on worst case assessments. If such confirmation is not possible, an assessment should be provided.
3.1.2	6.2.18	Construction phase Non-Road Mobile Machinery (NRMM) emissions	The Scoping Report seeks to scope out construction phase NRMM emissions. The Scoping Report references relevant guidance and distance to receptors in concluding that significant effects from NRMM when best practice measures are in place are unlikely. The Inspectorate agrees with this matter being scoped out, however best practice measures and other such mitigation should be clearly secured through the dDCO.
3.1.3	6.2.23	Operational emissions of water vapour, N_2, O_2, H_2, CH_4 and CO_2	The Scoping Report seeks to scope out the assessment of water vapour, N_2, O_2, H_2, methane (CH_4), and carbon dioxide (CO_2). The Scoping Report explains that any emissions would be small and diluted, however does not provide information on volumes or

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			evidence to substantiate this statement. The Applicant's attention is drawn to the response from the United Kingdom Health Security Agency (UKHSA) regarding assessment of 'non-threshold pollutants'. The Inspectorate therefore does not agree that these matters can be scoped out of the ES at this stage. The ES should include confirmation of the likely volume of emissions and concentration of pollutants, and assess any potential for significant effects. Please refer to the Inspectorate's comments at ID 3.12.4 regarding the assessment of CH_4 as part of the greenhouse gas (GHG) assessment in the Climate Change ES Chapter.
3.1.4	6.2.25	Emissions from the connection corridors	The Inspectorate agrees that operation of the hydrogen pipeline, natural gas, electrical and water connections is not likely to result in significant effects from emissions to air and this matter can be scoped out of the ES.

ID	Ref	Description	Inspectorate's comments
3.1.5	N/A	Public and private amenity areas	Paragraph 6.5.4 of the Scoping Report describes that there are areas of public and private amenity in proximity to the Proposed Development, eg around Coatham. These are not discussed in relation to this aspect. The assessment should consider the potential for any likely significant effects on these areas and users of the areas.
3.1.6	N/A	Construction emissions from vehicles	The assessment of effects arising from construction vehicle emissions should also be informed by Natural England's guidance relating to assessment of road traffic emissions under the Habitats Regulations, NEA001.

3.2 Surface Water, Flood Risk and Water Resources

(Scoping Report Section 6.3)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.2.1	N/A	N/A	No matters have been proposed to be scoped out of the assessment.

ID	Ref	Description	Inspectorate's comments
3.2.2	6.3.11 to 6.3.19	Flood zones	The Scoping Report identifies Flood Zones across the Study Area however does not include sub-categories, such as an area of high probability (Flood Zone 3a) or functional floodplain (Flood Zone 3b). The ES should provide an accurate and consistent description of the baseline flood risk for each element of the Proposed Development and the description should clearly distinguish between Flood Zones, including Flood Zones 3a and 3b where relevant. The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding Flood Zones; the Inspectorate notes that there is a discrepancy between information in the Scoping Report, which identifies that Main Site B is entirely within Flood Zone 1, and the EA's information, which states it is primarily within Flood Zone 1 but partially within Flood Zones 2 and 3. The Flood Zone should be confirmed within the ES and mitigation identified as required.
3.2.3	6.3.20	Pollution of surface watercourses during operation	The Scoping Report scopes in assessment for this matter during construction and decommissioning. Consideration of the potential for accidental spillages during operation is proposed to be assessed as part of Geology, Hydrogeology and Contaminated Land (paragraph 6.4.88 of the Scoping Report). Cross-reference should be made to the

ID	Ref	Description	Inspectorate's comments
			outcome of that assessment in the Surface Water, Flood Risk and Water Resources chapter of the ES.
3.2.4	6.3.27	Effluent streams and discharges	The ES should clearly describe the effluent streams and discharges associated with construction and operation of the Proposed Development and any permits required/ implications for existing permits. Effort should be made to agree the scope and methodology of assessment work, including water quality modelling, in respect of effluent streams and other discharges to water with relevant consultation bodies. Evidence of discussions and any agreements reached should be provided within the ES. The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding assessment of foul drainage in the ES.
3.2.5	Section 6.3	Additional assessments	The Inspectorate notes that a Flood Risk Assessment (FRA), Water Framework Directive (WFD) assessment and nutrient neutrality assessment will be prepared. Information from these assessments should be used to inform preparation of the ES. The Scoping Report describes surface water bodies and groundwater bodies designated under the WFD, which are located close to the Proposed Development. The ES should include an assessment of the likely significant effects to both types of WFD water body. The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding scope of the WFD and nutrient neutrality assessments.
3.2.6	N/A	Scope of assessment – FRA	The FRA underpinning the ES assessment should additionally cover matters including the effect that temporary mounds of soil in the floodplain could have on flood risk, the volumes of water displacement involved and mitigation measures where necessary.

ID	Ref	Description	Inspectorate's comments
			The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding scope of the FRA and climate change allowances.
3.2.7	N/A	Impacts from frac-out	The ES should include an assessment of likely significant effects arising from frac-out, ie fracking fluid breakout during HDD works, on aquatic environment receptors and water resource receptors, including consideration of any impacts arising from clean-up works. The Applicant's attention is drawn to Natural England's comments in Appendix 2.
3.2.8	N/A	Scope of assessment	The ES should assess the potential for an increase in offsite flood risk arising from any proposed ground raising within the development boundary, including the pipeline corridors. Effort should be made to agree the scope of the assessment, including the requirement for flood modelling, with the EA. The ES should identify any mitigation required to address likely significant effects.

3.3 Geology, Hydrogeology and Contaminated Land

(Scoping Report Section 6.4)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.3.1	6.4.88	Potential effects	In addition to the impact pathways described at paragraph 6.4.88 of the Scoping Report, the ES should include an assessment of effects arising from changes to groundwater flow, levels and quality during construction, operation and decommissioning, including from the presence of below ground pipelines, where likely significant effects could occur. The Inspectorate notes that paragraph 6.3.20 of the Scoping Report states that potential impacts to groundwater flow would be assessed as part of this aspect.

ID	Ref	Description	Inspectorate's comments
3.3.2	6.4.88	Drainage strategy	The Scoping Report refers to implementation and maintenance of operational drainage systems to control potential impacts from pollution to surface watercourses. The Applicant should provide a draft/outline version of the drainage strategy and demonstrate how this will be secured through the dDCO or other legal mechanism. Potential construction phase impacts should also be addressed in a drainage strategy.
3.3.3	6.4.89	Baseline information	The desk-based assessments and conceptual site model should be submitted as part of the ES. In addition to Main Sites A and B, these documents should provide information about land within the connection corridors. The baseline information should be sufficient to enable an assessment of the likely significant effects arising from the construction and operation of the Proposed Development, including consideration of the range of construction methods proposed or on

ID	Ref	Description	Inspectorate's comments
			the basis of any assumed construction methods where they are not known at time of ES preparation. This should include ground investigation if deemed necessary to sufficiently understand the baseline environment. The Inspectorate notes that risk from unexploded ordnance (UXO) is scoped into the assessment of major accidents and hazards. UXO is not referenced in Section 6.4 of the Scoping Report, but the Inspectorate expects the collection of baseline data to include information to support assessment in the Major Accidents and Hazards ES Chapter.
3.3.4	6.4.90	Intrusive investigation	The ES should include a full description of any further intrusive investigation required and confirm how this is to be secured. Effort should be made to agree the scope with all relevant consultation bodies, eg Hartlepool Council and Stockton-on-Tees Council where it relates to land within their administrative area.
3.3.5	N/A	Drinking water protected areas	The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding groundwater bodies being designated as drinking water protected areas. The status of the groundwater bodies should be reflected in the baseline description and assessment of potential impacts in the ES.

3.4 Noise and Vibration

(Scoping Report Section 6.5)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.4.1	6.5.26	Operational road traffic noise	The Scoping Report seeks to scope out effects from operational road traffic noise on the basis that the Proposed Development is unlikely to have a significant impact on existing traffic flows on the local road network. Paragraph 3.15.6 of the Scoping Report identifies that there is an anticipated maximum workforce of 85 staff and that deliveries of operational and maintenance consumables will be managed to minimise traffic movements. The Inspectorate recognises that significant effects are unlikely during operation, however the ES should provide further information on the predicted number of movements required for consumables during operation to demonstrate that these will remain under the thresholds. The Inspectorate considers that providing that this information is included in the ES, based on the low number of traffic movements predicted during operation, this matter can be scoped out of the ES. Please refer to the Inspectorate's comment about operational HGV movements at ID 3.8.1 of this Scoping Opinion.

ID	Ref	Description	Inspectorate's comments
3.4.2	6.5.13	Assessment of vibration during operation	The Scoping Report states that significant vibration impacts during operation are not likely due to the distance between the Proposed Development and receptors but operational activities will be briefly considered in the ES. The ES should describe the activities likely to give rise to vibration effects.

ID	Ref	Description	Inspectorate's comments
			The Inspectorate agrees with the Applicant's approach to this matter. The ES should include confirmation of any sources of vibration, and the likely levels together with the relevant thresholds for significant effects at the nearest receptor(s) to demonstrate that significant effects are not likely to occur.

3.5 Ecology and Nature Conservation (including Aquatic Ecology)

(Scoping Report Section 6.6)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.5.1	6.6.15	Great crested newt (GCN) surveys	The Scoping Report seeks to scope out surveys on land located to the south of the River Tees on the basis that the Industry Nature Conservation Association (INCA) (a membership organisation including the Tees Valley Wildlife Trust) confirmed for the NZT project that there are known occurrences of GCN in this area. Table 6-3 of the Scoping Report states that land to the north of the River Tees would be surveyed if a District Level Licensing (DLL) approach is not agreed with Natural England. The Inspectorate agrees that surveys on land to the south of the River Tees can be scoped out of the ES.
3.5.2	6.6.18	Effects on relevant habitats and species from water quality changes during operation	The Scoping Report states that temporary effects to water quality during construction would be considered but does not reference potential effects during operation, for example from spillages or discharges, extraction of water and/ or effluent discharge. The ES should include an assessment of this matter or otherwise demonstrate why significant effects are not likely to occur. Cross-reference should be made to the assessment in the Surface Water, Flood Risk and Water Resources ES Chapter.
3.5.3	Table 6-3	Bat activity surveys along connection corridors	The Scoping Report identifies the intention to limit surveys to areas of suitable habitat where permanent effects eg loss are predicted. The Inspectorate accepts, as stated in Table 6-3 of the Scoping Report, that such surveys may not be warranted in relation to temporary habitat loss. However, the Inspectorate considers that they may be required to inform the assessment of likely significant

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			effects and the design of appropriate mitigation in relation to the effects of construction lighting and effects resulting from impacts to linear habitat features. These matters should be considered in the ES where likely significant effects could occur, supported by appropriate evidence such as bat activity survey data. The Applicant should seek agreement from relevant consultees and provide a description of the approach taken in the ES, incorporating any relevant advice.

ID	Ref	Description	Inspectorate's comments
3.5.4	6.6.18 and Section 6.2 (Air Quality)	Air quality effects on sensitive ecological receptors	The Scoping Report states that air quality impacts from construction traffic emissions and operational emissions will be considered but does not specify for which pollutants. Section 6.2 (air quality) of the Scoping Report identifies which pollutants are proposed to be assessed but does not reference nitrogen deposition or acid deposition as potential impacts which could affect sensitive ecological receptors. For the avoidance of doubt, the potential for nitrogen deposition and/or acid deposition to arise and result in effects on ecological receptors should be considered in the ES, and subject to assessment where a pathway for significant effects is identified.
3.5.5	Table 6-3	Bird surveys, including functionally linked land (FLL)	The ES should give a full description of how areas of FLL have been identified for survey, the levels of precaution applied to this process, and the outcomes of consultation and degree of agreement reached with key stakeholders. It is also advised that the scope and methodology of the ornithological surveys is discussed with the relevant consultees and agreed where possible.

ID	Ref	Description	Inspectorate's comments
3.5.6	Table 6-3	GCN – information to support of assessment of effects	With regard to the Proposed Development site to the north of the River Tees, the Scoping Report states it is proposed to consult NE about whether a District Level Licensing (DLL) approach would be available for this project. If not, it is proposed to undertake habitat suitability assessment surveys to inform the assessment in the ES, in addition to eDNA and/ or presence/ absence surveys. It also sets out the circumstances where population size class assessment surveys may be undertaken to inform the assessment of effects. The Inspectorate is content with this approach to GCN. The Applicant's attention is drawn to Natural England's comments in Appendix 2 and the Inspectorate's Advice Note 11, Annex C.
3.5.7	Table 6-3	Otter and water vole surveys	The Scoping Report states that presence/ absence surveys will be undertaken in locations where open cut crossings of watercourses and ditches will be required. The Inspectorate notes that trenchless crossings are proposed at several locations, but no information is presented as to whether otter or water vole are likely to be present here and/ or whether crossing installation would generate potential impact pathways. The survey area should include trenchless crossing locations, or the ES should otherwise demonstrate why a significant effect is not likely to occur in these locations.
3.5.8	Table 6-3	Detailed surveys for reptiles, freshwater species, terrestrial vertebrates and plants	The Scoping Report states that the requirement for species' surveys will be informed by further desk-based assessment and the findings of the Phase 1 Habitat survey. The Inspectorate agrees with the approach set out. Effort should be made to agree the survey scope and methodology with the relevant consultation bodies.

ID	Ref	Description	Inspectorate's comments
			The ES should include an assessment of likely significant effects to these receptors where these could occur, or information demonstrating absence of a likely significant effect and where agreement has been reached with relevant consultation bodies.
3.5.9	6.6.32	Biodiversity net gain (BNG)	The Scoping Report states that the project will aspire to achieve net gain and that a BNG assessment will be undertaken. The ES should clearly distinguish between mitigation for significant adverse effects on biodiversity from wider enhancement measures. The Applicant's attention is drawn to Natural England's comments in Appendix 2 regarding the latest Biodiversity Metric 4.0.
3.5.10	N/A	Scope of assessment	The assessment of temporary disturbance impacts to habitats should include consideration of likely significant effects arising from the construction of the hydrogen pipeline in proximity to Greatham Creek and Saltern Wetlands. The Applicant's attention is drawn to the EA's comments in Appendix 2 in this regard.
3.5.11	N/A	Confidential annexes	Public bodies have a responsibility to avoid releasing environmental information that could bring about harm to sensitive or vulnerable ecological features. Specific survey and assessment data relating to the presence and locations of species such as badgers, rare birds and plants that could be subject to disturbance, damage, persecution, or commercial exploitation resulting from publication of the information, should be provided in the ES as a confidential annex. All other assessment information should be included in an ES chapter, as normal, with a placeholder explaining that a confidential annex has been submitted to the Inspectorate and may be made available subject to request.

3.6 Ornithology

(Scoping Report Section 6.7)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.6.1	N/A	N/A	No matters have been proposed to be scoped out of the assessment.

ID	Ref	Description	Inspectorate's comments
3.6.2	N/A	Operational discharges to water	In addition to the impact pathways identified in the Scoping Report, the Inspectorate advises that consideration should be given to the potential for operational discharges to water to results in likely significant effects to bird qualifying features of the Teesmouth and Cleveland Coast Special Protection Area and Ramsar. The ES should include an assessment of these matters where significant effects are likely, or otherwise provide evidence to demonstrate why significant effects are not likely.
3.6.3	N/A	Confidential annexes	Please refer to the Inspectorate's comments at ID 3.5.11 of this Scoping Opinion.

3.7 Marine Ecology

(Scoping Report Section 6.8)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.7.1	6.8.11	Effects to the Southern North Sea Special Area of Conservation (SAC) during construction, operation and decommissioning	The Scoping Report seeks to scope out effects to the Southern North Sea SAC, for which harbour porpoise is a qualifying feature, on the basis that it is located more than 100km from the Proposed Development and, as such, there are no impact pathways. In this regard, the Inspectorate also notes that paragraph 6.8.27 of the Scoping Report states that there are no impact pathways from underwater sound arising from the proposals. The Inspectorate agrees that the SAC can be scoped out of the ES on the basis described in the Scoping Report.
3.7.2	6.8.12	Project specific marine ecology surveys	The Scoping Report seeks to scope out surveys on the basis that the assessment will use baseline data from a range of other sources, including surveys completed for the nearby NZT project, as well as construction techniques that are designed to avoid impact pathways, eg trenchless crossings or existing pipelines for the proposed watercourse crossings. It is stated that requirement for surveys will be kept under review with NE and the MMO. The Inspectorate agrees that marine mammal and benthic ecology surveys can be scoped out on the basis set out in the Scoping Report. If the scope of the Proposed Development changes to include additional works within the marine environment (ie beyond watercourse crossings as described at paragraph 6.8.17 of the Scoping Report), the need for surveys of affected areas should be discussed with relevant consultation bodies with a view to seeking agreement on requirements and scope, as required.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			The description of the baseline environment in the ES should reference any further data collected for pre-commencement or construction monitoring surveys associated with NZT and/or other nearby developments. The ES should explain any limitations or assumptions made about use of this data, together with how the assessment has addressed these difficulties. With regard to fish surveys, the Inspectorate notes that potential impact pathways from underwater sound, and possibly entrapment and entrainment have been identified. The Applicant should determine the need for fish surveys to provide an up-to-date and adequate understanding of the baseline to support assessment of these impact pathways in the ES. Effort should be made to agree the requirement for, and scope of, any survey work with the relevant consultation bodies.
3.7.3	6.8.19 to 6.18.20	Effects from noise and vibration during construction of pipelines at River Tees and Greatham Creek	The Scoping Report seeks to scope out effects from noise and vibration on the basis that trenchless technologies and/ or existing pipelines or tunnels would be used. The Inspectorate notes that paragraph 6.8.21 of the Scoping Report states that *'many design elements… have yet to be confirmed, development design and impact avoidance measures have not been finalised.'* The Scoping Report does not include any information about the predicted noise and vibration levels from the proposed works or sensitivity of ecological receptors. The Inspectorate therefore does not have sufficient information to reasonably conclude that there will be no likely significant effects. Accordingly, the ES should include an assessment of these matters, or information demonstrating agreement with the relevant consultation bodies and the absence of likely significant effects.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.7.4	6.8.27	Effects from underwater sound during construction, operation and decommissioning	The Scoping Report seeks to scope out effects from underwater sound as there are no impact pathways eg no use of vessels, drilling/ piling and/ or UXO clearance is expected in the marine environment. The Inspectorate notes that the proposed hydrogen pipeline would cross the tidal River Tees and that there is potential for noise and vibration impacts arising from construction of the pipeline to migratory fish. This matter should be assessed in the ES. The assessment should consider the worst case construction methods sought within the dDCO, and the potential for cumulative effects with other developments in the area. The ES should identify mitigation required in respect of any significant effects identified and explain how this would be secured in the dDCO.

ID	Ref	Description	Inspectorate's comments
3.7.5	6.8.23	BNG	The Inspectorate notes that permanent loss of habitat in the intertidal area is not proposed but if the approach changes, consideration would be given to the *'requirements of the Environment Act 2021'* including a BNG assessment. The ES should clearly distinguish between mitigation for significant adverse effects on biodiversity from wider enhancement measures. The mitigation hierarchy should be adhered to where practicable.
3.7.6	N/A	Coastal saltmarsh habitat	The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding the presence of coastal saltmarsh habitat adjacent to Greatham Creek. The baseline habitat should be correctly described in the ES and supporting figures. The assessment of impacts arising from installation of the proposed pipelines should include

ID	Ref	Description	Inspectorate's comments
			consideration of this habitat and identify any mitigation required for likely significant effects, and how this would be secured in the dDCO.
3.7.7	N/A	Fish entrapment and entrainment	The ES should include an assessment of effects arising from the risk of fish entrapment and entrainment associated with abstraction of water from WFD waterbodies and/ or cooling water systems required for the Proposed Development. The ES should identify any mitigation required, and how this would be secured in the dDCO.
3.7.8	N/A	Discharge of cooling waters	If cooling water is proposed to be discharged to the Tees Estuary or other WFD waterbodies, the ES should include an assessment of likely significant effects arising from thermal properties of the discharge of the cooling water. The assessment should include consideration of cumulative effects with other development in the area. Effort should be made to agree the scope of assessment, and any modelling required, with relevant consultation bodies including the EA and Natural England. The ES should identify any mitigation required, and how this would be secured in the dDCO.
3.7.9	N/A	Hard structures	If any hard structures (eg pipe outflow, rock armouring or equivalent) are proposed then the assessment of habitat loss and disturbance should also consider potential changes in coastal processes and introduction of invasive non-native species (INNS).

3.8 Traffic and Transportation

(Scoping Report Section 6.9)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.8.1	6.9.14	Impacts from operational traffic	The Scoping Report seeks to scope out operational road traffic flows from detailed assessment, stating that the anticipated maximum workforce of 85 staff on site within a 24 hour period is unlikely to give rise to significant effects. This approach is to be agreed with the Local Highway Authority. Having considered the nature and characteristics of the Proposed Development, the Inspectorate agrees that subject to confirmation of the number and type of all operational vehicle movements (ie HGVs in addition to staff) in the ES description of development, operational traffic movements are not likely to result in significant effects and that an assessment of this matter can be scoped out of the ES. Agreement should be sought from the relevant Highways Authority.

ID	Ref	Description	Inspectorate's comments
3.8.2	6.9.22	Future baseline	The ES should clearly explain how the future baseline has been calculated and how this has considered other planned development in the area using the same road network during the construction period.
3.8.3	N/A	Abnormal indivisible loads (AIL)	The Scoping Report states that local ports are being considered for transport of AIL and that consideration will be given to the appropriate port and AIL routes during the design process. The ES should include an assessment of the likely significant effects arising from transportation of AIL via each proposed transportation

ID	Ref	Description	Inspectorate's comments
			method and identify any mitigation measures required and how these would be secured.
3.8.4	N/A	Hazardous loads	The ES should include an assessment of likely significant effects arising from the transportation of hazardous loads during construction and operation of the Proposed Development, and identify any mitigation required (including drainage systems) and how this would be secured through the dDCO.

3.9 Landscape and Visual Amenity

(Scoping Report Section 6.10)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.9.1	6.10.19	Night-time light pollution impacts	The Applicant proposes to scope out impacts of night-time light pollution on landscape and visual amenity receptors. The Scoping Report states that due to the industrial nature of the surrounding area, existing levels of lighting are high and significant effects on sensitive receptors are unlikely to occur. The Inspectorate considers that, given the scale of the Proposed Development, the ES should provide an assessment of the effects of night-time light pollution on landscape and visual receptors during all phases of the Proposed Development or provide further justification for why significant effects would not arise.

ID	Ref	Description	Inspectorate's comments
3.9.2	6.10.6	Visual amenity receptors	It is not clear if users of waterways have been identified as visual receptors in the assessment. The ES should either assess effects on users of the waterways, such as the River Tees, and the Tees Bay and Estuary, or provide a justification as to why they would not experience significant effects.
3.9.3	6.10.14	Zone of Theoretical Visibility (ZTV) / Study area	The Scoping Report states that the ZTV will be generated using a bare ground Digital Terrain Model (DTM) and the representative viewpoints will be identified in the ZTV considering the main building envelope, the potential stacks and taller columns and any structures required for the connections. The ES should clearly evidence and justify the final extent of the ZTV used and ensure that any

ID	Ref	Description	Inspectorate's comments
			assessment of significance is based on the worst-case scenario. Effort should be made to agree the ZTV with relevant consultation bodies.
3.9.4	6.10.14	Representative viewpoints	The Inspectorate notes that the Applicant proposes to produce representative viewpoints from approximately 12 locations identified within the ZTV. Both winter and summer views should be included. In finalising the viewpoint locations, the Applicant should consider the production of representative viewpoints from the North York Moors National Park, national trails, River Tees/Tees Bay and Estuary and the scheduled monuments at Eston Nab to support a comprehensive assessment of visual impact to recreational users. Effort should be made to agree the locations and photomontage type with relevant consultation bodies.
3.9.5	6.10.16	Site layout and parameters	The ES should explain how the siting and design of the proposed structures (and materials to be used) have been selected with the aim of minimising impacts to landscape and visual receptors. The Applicant's attention is drawn to Natural England's comments in Appendix 2 in respect of design policies and codes.
3.9.6	6.10.20	Landscape mitigation	The ES should clearly describe any proposed planting and how the landscape and visual effects are expected to alter as any such planting matures.
3.9.7	N/A	North Yorkshire Moors National Park	North Yorkshire Moors National Park should be considered as a receptor in the assessment of effects to landscape character, where significant effects are likely to occur to this receptor, or the ES should otherwise demonstrate why significant effects are not likely to occur. Any assessment should include effects on the special qualities of the designated landscape.

ID	Ref	Description	Inspectorate's comments
3.9.8	N/A	Photomontages	The ES should ensure that the viewpoints and subsequent photomontages chosen are appropriate and representative for whether Main Site A or Main Site B is taken forward as the final design for the Proposed Development. Where flexibility is sought, the photomontages produced should demonstrate the visual impacts arising from options still under consideration to enable effects to be fully understood.

3.10 Cultural Heritage

(Scoping Report Section 6.11)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.10.1	6.11.18	Direct impacts to marine cultural heritage assets (below Mean High Water Springs (MHWS))	The Applicant intends to scope out direct impacts to marine cultural heritage assets during construction and operation of the Proposed Development. The Scoping Report states that no construction works are proposed in areas below MHWS where marine heritage assets are likely to be located and more highly concentrated. The Inspectorate agrees that based on the information provided, construction and operation of the Proposed Development is unlikely to give rise to significant effects from direct impacts to marine cultural heritage assets and is therefore content for this matter to be scoped out.
3.10.2	6.11.18	Direct impacts to marine heritage assets located in River Tees	The Applicant proposes to scope out direct impacts to heritage assets located in the River Tees as construction methodologies such as HDD or Micro-bored Tunnel (MBT) will be utilised to minimise disturbance to sensitive receptors during construction of the hydrogen pipeline beneath the river. The Inspectorate agrees that based on the information provided, construction and operation of the Proposed Development is unlikely to give rise to significant effects from direct impacts to marine cultural heritage assets in the River Tees and therefore agrees that this matter can be scoped out.

ID	Ref	Description	Inspectorate's comments
3.10.3	6.11.11	Desk-based assessment	The Scoping Report states that a desk-based assessment would be produced. No reference is made to whether any further surveys are required to inform the archaeological baseline. The Inspectorate is of the opinion that should the desk-based assessment identify the need for further investigation, such as geophysical survey, monitoring of geotechnical ground investigations or trial trenching, the Applicant should make every effort to agree the scope of such activities with relevant consultation bodies. The results and assessment of effects to archaeology should be clearly presented within the ES along with a description of any uncertainties or assumptions applied, and confirmation of any further survey and evaluation required and how this would be secured.
3.10.4	6.11.12	Study Area	The ES should clearly describe how the final study areas have been defined according to sensitivity of receiving heritage assets and potential impacts during construction and operation of the Proposed Development. The Applicant should seek agreement with the relevant consultation bodies regarding the study areas used to inform the assessment and evidence this in the ES.
3.10.5	6.11.18	Indirect impacts to marine cultural heritage assets, including those within the River Tees	Indirect impacts to marine cultural heritage assets, such as temporary and permanent changes to their setting during construction and operation of the Proposed Development respectively, have not been explicitly identified in the Scoping Report. The ES should consider the potential for indirect impacts to marine heritage assets to give rise to likely significant effects or provide a justification as to why they would not experience significant effects.
3.10.6	N/A	Historic landscape character	The ES should also assess effects to historic landscape character where significant effects are likely to occur.

3.11 Socio-Economics and Land Use

(Scoping Report Section 6.12)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.11.1	6.12.22	Effects to best and most versatile (BMV) agricultural land – construction and operation	The Scoping Report describes that parts of the proposed hydrogen pipeline corridor comprise BMV land under the Agricultural Land Classification (ALC) system. ALC Grade 2 land is located near Kirkleatham. Grade 3 land near Greatham is identified as being possible BMV land. The Applicant seeks to scope out effects on BMV land on the basis that impacts would be temporary during pipeline installation. It is stated that in the worst case scenario of open cut method, soil that is disturbed would be retained in-situ to infill the trench. The Scoping Report does not state the area of BMV land that would be affected or whether there would be a requirement for restrictions over the pipeline corridor during operation. No information is provided about soil handling and reinstatement following construction and/ or requirements for maintenance during operation. These matters should be addressed in the ES. The Inspectorate notes that National Policy Statement (NPS) EN-4, paragraph 2.23.7 requires information about mitigation measures for soil to be provided. The Inspectorate does not have sufficient information to agree that this matter can be scoped out of assessment. It is also noted that paragraph 3.5.3 of the Scoping Report states that the pipeline could be above ground and it is therefore unclear whether any BMV land would be permanently sterilised. The ES should provide an assessment of effects to BMV land and an explanation of how any loss of BMV land would be minimised, or demonstrate that impacts would

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			not give rise to likely significant effects, including evidence of agreement with relevant consultation bodies.

ID	Ref	Description	Inspectorate's comments
3.11.2	6.12.4	Baseline data	The Scoping Report states that 2011 census data would be used. The Office for National Statistics (ONS) has commenced publication of 2021 census data and the Inspectorate advises that reference should be made to 2021 data where relevant to the assessment.
3.11.3	N/A	Effects on housing affordability and availability	The Scoping Report does not reference potential impacts on housing during construction. It is noted that construction workforce peak will be approximately 3,100 people per day (paragraph 3.14.1 of the Scoping Report), but it is not stated whether these would be non-home-based workers or if there would be a requirement for temporary living accommodation. The Inspectorate advises that if a significant number of non-home-based construction workers are required, this could foreseeably have an impact on local availability of affordable housing, including from cumulative effects with other large developments nearby. The ES should provide an assessment of effects on the local private rented sector and tourist accommodation or demonstrate that impacts would not give rise to likely significant effects, including evidence of agreement with relevant consultation bodies.

3.12 Climate Change

(Scoping Report Section 6.13)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.12.1	N/A	N/A	No matters have been proposed to be scoped out of the assessment.

ID	Ref	Description	Inspectorate's comments
3.12.2	Figure 10	GHG emissions arising from disturbance of landfill sites	The Inspectorate notes from Figure 10 of the Scoping Report that there are active and historic landfill sites present within the Proposed Development site. If any underground construction works cannot avoid these sites, the potential to increase, or give rise to, GHG emissions from these sites during construction should be included in the assessment.
3.12.3	N/A	CO_2 emissions	The Inspectorate notes that the CO_2 generated from the Proposed Development is proposed to be exported via the proposed NZT project and to the proposed NEP offshore storage. The ES should describe the status of these projects and any uncertainty around this method of exportation and/ or alternative proposals. Please refer to the Inspectorate's comments at ID 2.1.3 of this Scoping Opinion regarding assessment of CO_2 emissions should the dDCO seek or allow for powers for the generating station component to operate independently of the carbon capture.
3.12.4	N/A	CH_4	Paragraph 6.2.23 of the Scoping Report indicates that CH_4 would be emitted during operation of the Proposed Development. It is stated that this would be small scale and be ready diluted, but the Scoping Report does not confirm the expected volume. The Inspectorate notes that CH_4 is a GHG. The ES should include consideration of CH_4

ID	Ref	Description	Inspectorate's comments
			emissions as part of the GHG assessment or otherwise demonstrate why the emissions are so small so as not to result in likely significant effects. The ES should describe any mitigation required in respect of CH_4 emissions and confirm how this would be secured in the dDCO.

3.13 Major Accidents and Disasters

(Scoping Report Section 6.14)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.13.1	6.14.25 and Appendix B	Leaks and spills of specified substances – construction and operation (including transportation via road for diesel and aqueous ammonia)	The Scoping Report lists substances which are considered to have no to low risk of resulting in major accidents and/ or hazards, and which are therefore proposed to be scoped out of further consideration in the ES. These substances are aqueous ammonia (NH_3), amine solution, substances used to treat water and effluent, diesel and substances used during construction (including liquid concrete), which would be subject to storage controls. For NH_3 and diesel, it is also stated that the quantity present on site and/ or in tankers is likely to be small and any impact would not reach the criteria for a major accident and/ or disaster. The ES should clarify whether the criteria referred to is that which is described at paragraph 6.14.20 of the Scoping Report, taken from the Control of Major Accidents and Hazards (COMAH) Regulations for ascertaining credible major accident and disaster scenarios. Regarding potential for road traffic accidents, it is stated that the quantity of any materials would be contained within drainage systems. The Inspectorate notes that these matters will be considered in the Geology, Hydrogeology and Contaminated Land ES Chapter (noting comments about operational phase impacts at ID 3.2.3 and ID 3.8.4, that these matters should also be considered in the Surface Water, Flood Risk and Water Resources, and Traffic and Transportation ES Chapters). However, the Inspectorate does not have sufficient information to exclude the possibility of leaks and spills resulting in risks of major accidents and disasters to the surrounding water environment, which is subject to international conservation designations. The ES should therefore include an assessment or

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			otherwise explain why significant effects are not likely; cross-reference can be made to assessments in other ES Chapters to avoid duplication of effort.
3.13.2	Appendix B	Marine accident – operation	The Scoping Report states that primary process materials will be transported via pipeline and *"marine transport is not applicable."* The Inspectorate agrees that this matter can be scoped out of the ES.
3.13.3	Appendix B	Failure of electrics and other systems/ utilities (water supply and effluent disposal) – operation	The Inspectorate notes the reasoning and evidence presented in the Scoping Report, including the provision of back-up power and the installation of safety systems to avoid a credible major accident and risk scenario. The Inspectorate considers that on this basis it is unlikely that risks to or from the Proposed Development from these matters would result in significant effects but notes that hydrogen is an emerging technology and that the regulatory framework and standards are likely to continue to evolve. As such the ES should provide information about how risks from failure of systems would be managed, including the design standards proposed to be used and why these are considered to be appropriate, together with an outline of any management plans proposed to demonstrate that likely significant effects can be excluded.
3.13.4	Appendix B	Meteorological hazards – operation	The Scoping Report seeks to scope out impacts from high windspeed, low temperatures/ heavy snow, high temperatures/ heatwave, drought and electrical storms (including lightning), on the basis that such impacts would be managed through engineering design. The Inspectorate does not have sufficient evidence about the engineering design to exclude the possibility of significant effects from vulnerability to meteorological hazards. The Inspectorate is not in a position to agree to scope this matter out from the assessment.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			The ES should include an assessment of this matter or information demonstrating agreement with the relevant stakeholders and the absence of a likely significant environmental effect. The Inspectorate advises that cross-referencing can be made to assessments in other ES aspect chapters, eg Climate Change, to avoid duplication of effort.
3.13.5	Appendix B	Earthquakes and ground stability – construction and operation	Based on the reasoning and evidence presented in the Scoping Report, the Inspectorate is content that risks to or from the Proposed Development from these matters are not likely to result in significant effects. These matters can be scoped out of the assessment.
3.13.6	Appendix B	Poor air quality – operation	The Scoping Report seeks to scope out effects as combustion emissions would be controlled and regulated in accordance with an environmental permit and subject to mitigation. It is stated that the Proposed Development will not contribute significantly towards road traffic pollution. The Inspectorate notes that this matter would be considered in other parts of the ES, including an air quality assessment of operational process emissions (as described at paragraph 6.2.24 of the Scoping Report) and is unlikely to lead to significant environmental effects and is satisfied that this matter can be scoped out of the Major Accidents and Disasters ES Chapter. In reaching this conclusion, the Inspectorate notes that potential risks from accidental release of toxic and/ or asphyxiant gas are separately scoped into the assessment.
3.13.7	Appendix B	Wildfires – construction and operation	Based on the reasoning and evidence presented in the Scoping Report, the Inspectorate is content that risks to or from the Proposed Development from this matter are not likely to result in significant effects. It can be scoped out of the assessment.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.13.8	Appendix B	Malicious attacks – operation	Based on the reasoning and evidence presented in the Scoping Report, the Inspectorate is content that risks to or from the Proposed Development from intentional violence, arson, cyber attacks and terrorism, are not likely to result in significant effects. These matters can be scoped out of the assessment.

ID	Ref	Description	Inspectorate's comments
3.13.9	6.14.27 to 6.14.28	Mitigation measures	The Inspectorate notes that the operational Proposed Development will be regulated through other consents and licences such as Hazardous Substances Consent, COMAH Licensing and environmental permits, which will include systems, controls and management procedures. A summary of the other consents and licences required, the aspects that they cover, and application status, should be included in the ES. The ES should include a clear description of mitigation measures required to reduce effects to not significant (or to a risk level as low as is reasonably practicable) and how they will be secured, including where this is through other consents and licences.
3.13.10	Appendix B	Construction hazards	In addition to the items listed in Table B-1 of the Scoping Report, potential risks of major accidents and/ or hazards from construction hazards to waterways and rail should be assessed, where significant effects likely to occur.
3.13.11	Appendix B	Nuclear facilities	Paragraph 6.14.7 of the Scoping Report states that Hartlepool nuclear power station is located nearby to the Proposed Development but no reference is made to the potential risks of major accidents and/ or hazards to or from nuclear facilities.

ID	Ref	Description	Inspectorate's comments
			The Inspectorate notes that it is proposed to scope in potential risks from domino events at the Teesside cluster of major hazard sites. This should include consideration of nuclear facilities where significant effects are likely to occur. The Applicant is referred to the comments from The Office for Nuclear Regulation at Appendix 2 of this Scoping Opinion.
3.13.12	N/A	Health and Safety Executive	The Inspectorate notes that the Proposed Development is located in an area that has several COMAH installations and that it is proposed to assess the potential risks of major accidents and disasters arising from a domino event. Effort should be made to agree the scope and methodology of assessment work with relevant consultation bodies, including the Health and Safety Executive.

3.14 Materials and Waste

(Scoping Report Section 6.15)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.14.1	6.15.14	Waste arising from extraction, processing and manufacture of construction components and products	The Inspectorate is content to scope this matter out noting controls that are in place meaning that significant effects are unlikely.
3.14.2	6.15.14	Environmental impacts associated with the management of waste	The Scoping Report states that likely significant effects on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste would be assessed in other relevant chapters within the ES. The ES should identify likely waste streams, and should ensure an assessment of effects during construction, operation and decommissioning. The Inspectorate agrees that impacts associated with management of waste do not need to be addressed in detail in the standalone Materials and Waste ES Chapter provided that adequate cross referencing is made to where it is addressed elsewhere in the ES, to ensure a full and robust assessment is undertaken.
3.14.3	6.15.14	Direct impacts on Mineral Safeguarding Areas (MSAs)	The Applicant proposes to scope out effects on MSAs (anhydrite and salt) on the basis that they occur at depth and could be extracted in an alternative manner (salt) or there is evidence that the resource has been sufficiently depleted (anhydrite). The Scoping Report does not state whether there would be a requirement for restrictions of development in the locations of the MSA (salt). The Proposed Development therefore has potential to sterilise the mineral resource and impact on any above ground infrastructure required in connection with salt extraction. The

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			Inspectorate therefore considers that this matter cannot be scoped out. Potential impacts on sterilisation of salt resource should be assessed within the Socio-economics and Land-use ES Chapter or further information should be presented to demonstrate that significant effects are not likely to occur. With regards to anhydrite, the Inspectorate is content to scope this matter out of the ES provided that information is included to demonstrate that the resource is sufficiently depleted.
3.14.4	6.15.14	Effects associated with decommissioning	The Inspectorate agrees that decommissioning effects can be scoped out of the ES providing the commitment to producing a Decommissioning Environmental Management Plan (DEMP) is secured within the dDCO. The DEMP should include assessment of matters listed in Table 6-8 of the Scoping Report.
3.14.5	Table 6-8	Operation – changes in availability of materials	Having considered the nature of the Proposed Development, the Inspectorate is satisfied that limited quantities of materials are likely to be required during operation and significant effects are therefore not likely to occur. The Inspectorate agrees that this matter can be scoped out of further assessment.

ID	Ref	Description	Inspectorate's comments
N/A	N/A	N/A	N/A

3.15 Human Health

(Scoping Report Section 6.16)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.15.1	6.16.11	Diet and nutrition, housing, relocation and radiation	Having considered the nature and characteristics of the Proposed Development, the Inspectorate agrees that there are no likely sources of impact for diet and nutrition, relocation and radiation determinants and these matters can be scoped out of the ES. Regarding housing, please refer to the Inspectorate's comments at ID 3.11.3 and comments made by UKHSA in their representation relating to availability of housing. If significant effects are likely to arise from the requirement to temporarily accommodate construction workers, then then ES should also consider the effects on human health from reduced housing availability and increased housing costs.

ID	Ref	Description	Inspectorate's comments
3.15.2	N/A	Scope of assessment – private water supplies	The Inspectorate advises that potential human health impacts, hazards and public health receptors surrounding private drinking water supplies during the construction phase, including the potential for contamination or disruption, should be scoped into further assessment work and reported upon within the human health chapter of the ES, where significant effects are likely.
3.15.3	N/A	Mental health impacts	The Scoping Report does not refer to mental health impacts. The Inspectorate advises that given the scale and nature of the Proposed Development, effects on mental health, including the potential for local public concern through understanding of risk/ risk perception for local communities and for the wider public in respect of the proposed

ID	Ref	Description	Inspectorate's comments
			hydrogen pipeline should be assessed and reported upon within the ES, where significant effects are likely.
3.15.4	N/A	Electronic and magnetic fields (EMF)	Please refer to the Inspectorate's comments at ID 3.17.1 with regard to assessment of the effects from EMF.

3.16 Cumulative and Combined Effects

(Scoping Report Section 6.17)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.16.1	N/A	N/A	No matters have been proposed to be scoped out of the assessment.

ID	Ref	Description	Inspectorate's comments
3.16.2	6.17.2	Methodology	The Applicant's attention is drawn to Table 2 in the Planning Inspectorate's Advice Note 17 which sets out the expected approach to identifying projects to be included in a cumulative impact assessment. This approach includes projects wider than those with extant planning permission.
3.16.3	6.17.4	Long and short list of projects	The Inspectorate understands from the information provided that the list of projects will be revised as consultation with stakeholders is undertaken and the ES is prepared. The ES should identify a 'cut-off' date with respect to this process so that the currency of it can be understood.
3.16.4	N/A	Study area	The Inspectorate notes the information provided on Figure 15 of the Scoping Report; however, this is provided without any justification of the projects identified. The ES should explain the reasoning behind the study area and the relationship with that which has informed the aspect chapters.

3.17 Electronic Interference

(Scoping Report Section 8.2)

ID	Ref	Applicant's proposed aspect to scope out	Inspectorate's comments
3.17.1	8.2.3	Impacts to human health from EMF	The Scoping Report seeks to scope out a standalone assessment of EMF on the basis that these will be considered in the human health assessment. It is stated that there are no nearby residential properties likely to be affected. Paragraph 3.6.4 of the Scoping Report states that there is potential for installation of new above and/ or below ground electrical connections. The human health assessment should demonstrate how the Proposed Development will comply, as a minimum, with relevant EMF guidelines in respect of these components (if they are required) to demonstrate that it will not give rise to significant effects.
3.17.2	8.2.5	Electronic interference to television and radio signals, and mobile phone reception	Based on the reasoning and evidence presented in the Scoping Report, the Inspectorate is content that this matter is not likely to result in significant effects. It can be scoped out of the assessment.

3.18 Aviation

(Scoping Report Section 8.2)

ID	Ref	Applicant's proposed aspect to scope out	Inspectorate's comments
3.18.1	8.2.6	Impacts to aviation from the presence of tall structures	The Scoping Report seeks to scope out this aspect on the basis that the maximum heights of new structures are anticipated to be comparable with structures that previously occupied the site. It is stated that the Civil Aviation Authority will be consulted and that the need for an assessment will be reviewed if structures are required to be taller. The Inspectorate agrees this aspect can be scoped out on that basis. Please refer to the Inspectorate's comments at ID 2.1.6 in respect of maximum (height) parameters.

APPENDIX 1: CONSULTATION BODIES FORMALLY CONSULTED

TABLE A1: PRESCRIBED CONSULTATION BODIES[1]

SCHEDULE 1 DESCRIPTION	ORGANISATION
The Health and Safety Executive	Health and Safety Executive
The National Health Service Commissioning Board	NHS England
The relevant Integrated Care Board	NHS North East and North Cumbria Integrated Care Board
Natural England	Natural England
The Historic Buildings and Monuments Commission for England	Historic England
The relevant fire and rescue authority	Cleveland Fire Brigade
The relevant police and crime commissioner	Cleveland Police and Crime Commissioner
The relevant parish council(s) or, where the application relates to land [in] Wales or Scotland, the relevant community council	Billingham Town Council
	Greatham Parish Council
The Environment Agency	The Environment Agency
The Maritime and Coastguard Agency	Maritime & Coastguard Agency
The Maritime and Coastguard Agency - Regional Office	The Maritime and Coastguard Agency - Hull (Beverley) Marine Office
The Marine Management Organisation	Marine Management Organisation (MMO)
The Civil Aviation Authority	Civil Aviation Authority
The Relevant Highways Authority	Hartlepool Borough Council
	Redcar and Cleveland Borough Council
	Stockton-on-Tees Borough Council

[1] Schedule 1 of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (the 'APFP Regulations')

SCHEDULE 1 DESCRIPTION	ORGANISATION
The relevant strategic highways company	National Highways
Trinity House	Trinity House
United Kingdom Health Security Agency, an executive agency of the Department of Health and Social Care	United Kingdom Health Security Agency
The Crown Estate Commissioners	The Crown Estate
The Forestry Commission	Yorkshire and North East
The Secretary of State for Defence	Ministry of Defence
The Office for Nuclear Regulation (the ONR)	The Office for Nuclear Regulation (the ONR)

TABLE A2: RELEVANT STATUTORY UNDERTAKERS[2]

STATUTORY UNDERTAKER	ORGANISATION
The relevant NHS Foundation Trust	North East Ambulance Service NHS Foundation Trust
Railways	Network Rail Infrastructure Ltd
	National Highways Historical Railways Estate
Dock and Harbour authority	PD Teesport
Licence Holder (Chapter 1 Of Part 1 Of Transport Act 2000)	NATS En-Route Safeguarding
Universal Service Provider	Royal Mail Group
Homes and Communities Agency	Homes England
The relevant water and sewage undertaker	Hartlepool Water (Anglian Water)
	Northumbrian Water
The relevant public gas transporter	Cadent Gas Limited

[2] 'Statutory Undertaker' is defined in the APFP Regulations as having the same meaning as in Section 127 of the Planning Act 2008 (PA2008)

STATUTORY UNDERTAKER	ORGANISATION
	Northern Gas Networks Limited
	Scotland Gas Networks Plc
	Wales and West Utilities Ltd
	Energy Assets Pipelines Limited
	ES Pipelines Ltd
	ESP Connections Ltd
	Fulcrum Pipelines Limited
	GTC Pipelines Limited
	Harlaxton Gas Networks Limited
	Indigo Pipelines Limited
	Last Mile Gas Ltd
	Leep Gas Networks Limited
	Squire Energy Limited
	National Grid Gas Plc
The relevant electricity generator with CPO Powers	MGT Teesside Limited
	Sofia Offshore Wind Farm Limited
	SSE Renewables Wind Farms (UK) Limited
The relevant electricity distributor with CPO Powers	Eclipse Power Network Limited
	Energy Assets Networks Limited
	ESP Electricity Limited
	Fulcrum Electricity Assets Limited
	Harlaxton Energy Networks Limited
	Indigo Power Limited
	Last Mile Electricity Ltd

STATUTORY UNDERTAKER	ORGANISATION
	Leep Electricity Networks Limited
	Mua Electricity Limited
	Optimal Power Networks Limited
	UK Power Distribution Limited
	Utility Assets Limited
	Vattenfall Networks Limited
	Northern Powergrid (Northeast) Limited
The relevant electricity transmitter with CPO Powers	National Grid Electricity Transmission Plc
	National Grid Electricity System Operator Limited

TABLE A3: SECTION 43 LOCAL AUTHORITIES (FOR THE PURPOSES OF SECTION 42(1)(B))[3]

LOCAL AUTHORITY[4]
North York Moors National Park Authority
Stockton-on-Tees Borough Council
Durham County Council
Darlington Borough Council
Hartlepool Borough Council
Middlesbrough Council
Redcar and Cleveland Borough Council
North Yorkshire Council

[3] Sections 43 and 42(B) of the PA2008

[4] As defined in Section 43(3) of the PA2008

TABLE A4: NON-PRESCRIBED CONSULTATION BODIES

ORGANISATION
Tees Valley Combined Authority
South Tees Development Corporation
Royal National Lifeboat Institution

APPENDIX 2: RESPONDENTS TO CONSULTATION AND COPIES OF REPLIES

CONSULTATION BODIES WHO REPLIED BY THE STATUTORY DEADLINE:
Environment Agency
Greatham Parish Council
Hartlepool Borough Council
Historic England
Middlesbrough Council
National Grid Electricity Transmission Plc
NATS En-Route Safeguarding
Natural England
North Yorkshire Council
Northern Gas Networks
Redcar and Cleveland Borough Council
Redcar and Cleveland Borough Council Highways Authority
South Tees Development Corporation
The Office for Nuclear Regulation
Trinity House
UK Health Security Agency

creating a better place
for people and wildlife

Environment Agency

Ms Laura Feekins-Bate
The Planning Inspectorate
3/18 Eagle Wing
Temple Quay House (2 The Square)
Temple Quay
Bristol
BS1 6PN

Our ref: NA/2023/116251/01-L01
Your ref: EN070009

Date: 09 May 2023

Dear Ms Feekins-Bate

PLANNING ACT 2008 (AS AMENDED) AND THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 (THE EIA REGULATIONS) – REGULATIONS 10 AND 11 APPLICATION BY H2 TEESSIDE LTD (THE APPLICANT) FOR AN ORDER GRANTING DEVELOPMENT CONSENT FOR THE H2TEESSIDE PROJECT (THE PROPOSED DEVELOPMENT) SCOPING CONSULTATION AND NOTIFICATION OF THE APPLICANT'S CONTACT DETAILS AND DUTY TO MAKE AVAILABLE INFORMATION TO THE APPLICANT IF REQUESTED LAND AT AND IN THE VICINITY OF THE FORMER REDCAR STEEL WORKS SITE, REDCAR AND IN STOCKTON-ON-TEES, TEESSIDE

Please find enclosed our written representations for the above Development Consent Order (DCO) on behalf of the Environment Agency (EA).

If you have any questions or require any clarification on the points below, please do not hesitate to contact me.

Yours sincerely

Lucy Mo
Planning Technical Specialist - Sustainable Places

Direct dial [redacted]
Direct e-mail [redacted]@environment-agency.gov.uk

Flood Risk

Flood Zones
The red line boundary for the full development (Main Sites A & B, and the pipeline) are located within flood zone 3, 2 and 1. The majority of Main Site B is situated within flood zone 1. However small portions of Main Site B are also situated within flood zone 2 and 3. Parts of the Hydrogen Pipeline Corridor are also within flood zone 2 and 3.

Flood Risk Vulnerability Classification
No information has been provided on the flood risk vulnerability classification within the Scoping Report. Therefore, we are unable to advise on our policy position in relation to flood risk until the vulnerability of the development has been confirmed by the applicant and/or the local planning authority. It should be noted that 'highly vulnerable' uses, requiring a Hazardous Substance Consent, would not be appropriate within flood zones 3. In accordance with Table 2 of the flood risk and coastal change section of the Planning Practice Guidance (PPG), 'highly vulnerable' developments are not appropriate in flood zone 3 and should not be permitted.

Flood Risk Assessment (FRA)
We welcome the inclusion of a FRA in support of the DCO application. The FRA must assess flood risk from all sources of flooding and recommend the mitigation measures that will be implemented to ensure a safe development for the design flood event (1 in 200 year including climate change). It must also demonstrate that flood risk will not be increased elsewhere.

Main Site Flood Risk Sources
The main source of potential flooding to the Main Site B is from the tidal stretch of the River Tees, but there could be other local sources of flooding such as groundwater and surface water. We have published a suite of interactive maps that indicate where possible flooding from different sources could occur Check the long term flood risk for an area in England - GOV.UK (www.gov.uk). Our maps are not suitable for a detailed Flood Risk Assessment **(**FRA), but they can indicate where further assessment may be needed.

Onsite Flood Risk
For Main Site B, flood risk mitigation measures will need to ensure it can remain safe for its' lifetime. Mitigation measures include raising the finished floor levels above the design flood event plus a freeboard allowance of 600mm.

Offsite Flood Risk
If ground raising is occurring within part of the development boundary, and the existing ground levels are below the design flood event, then an assessment will be required to confirm no increase in offsite flood risk. Given current topographical levels of the Main Site and if ground raising is significant which is below the design flood event, then flood modelling should be undertaken. If the pipeline is causing any ground raising, or is above ground which could impact local flood mechanisms, an assessment will be required to understand any increase in offsite flood risk and provide mitigation measures, this assessment could include modelling.

Flood Risk Information the Environment Agency (EA) Holds
We have an outline for a 1 in 200-year level undefended model that can be requested for the River Tees. The modelling we have for this location does not include climate change allowances and therefore this will need to be calculated in accordance with the 'Flood risk assessments: climate change allowances'. As the development location is at

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risk from tidal flooding, sea level allowances will need to be applied to the 1 in 200-year level for the lifetime of the development using both higher central and upper end allowances.

The EA's Port Clarence and Greatham tidal study (includes climate change) are available upon request. Requests for data should be sent to northeast-newcastle@environment-agency.gov.uk. Please note that requests for data can take up to 20 working days to process.

Hydrogen pipeline corridor
The proposed hydrogen pipeline corridor routes will have impacts on our existing flood defences, our land and our future schemes. These are discussed below:

Pipeline Routes
The proposed hydrogen pipeline corridor heading north towards the Venator Plant, could affect our flood defence assets along Greatham Creek and the EA's land holding at Marsh House Farm. In addition, all three routes (labelled R1, R2 and R3 on a document previously supplied to the EA ('All Utility Connection Corridor, Figure 1') could have a significant impact on Greatham Creek and its associated saltmarsh habitat - the last remaining natural area of the original Tees Estuary. In particular, R2 and R3 in particular are of significant concern to the EA.

R2 runs along the line of one of our major flood defences at Cowpen Marsh. The defence lies between the Cowpen Bewley Landfill (to the West) and the Teesmouth and Cleveland Coast Special Protection Area (SPA) (to the East). As such, any work along this corridor could impact one the three current land uses.

To the north of Greatham Creek, R2 then runs through Saltern Wetlands (an area of saltmarsh owned by the EA) and under the EA's flood embankment to the south of the ConocoPhillips tank farm. The EA has concerns that this route will have an impact on the wetland area, which lies with the SPA, and flood defences.

R1 crosses the no. 4 brinefield (owned by Sabic and used for hydrocarbon storage), and under the flood embankment on the south bank of Greatham Creek (Sabic Embankment). It also lies under the flood embankment on the north bank of Greatham Creek, which is to be significantly repaired as part of EA's Greatham North East Flood Alleviation Scheme (FAS). This route also crosses the redundant no. 5 brinefield (owned by Inovyn Chlorvinyl Ltd) and the ConocoPhillips oil pipeline corridor and Seal Sands Emergency Access Road.

R3 crosses our land at Marsh House Farm to be used for the extraction of clay in 2024-2026 for our Greatham NE FAS.

The EA is also developing a scheme (Greatham North East FAS) to improve the defences to the south of the Venator Plant. We expect to submit an application for planning permission in Spring 2024, and hope to start construction of the scheme in summer 2024. We are currently seeking contributions from beneficiaries of the scheme. As the proposed pipeline could benefit from our works, we would welcome discussions with the applicant on the potential for financial contributions from DCO, if R1 is chosen as the preferred route.

The EA would require the existing flood standard of protection, provided by the defences to be maintained both during the construction of the pipeline, and after completion of the scheme, whichever route is chosen. In order mimimise the impact of

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the DCO on our flood defences, consideration should be given to the following comments:

Pipeline Design

- Where the pipeline crosses a flood defence structure below ground, designs for the pipeline must include a load case for the top water level. This may be different at each location. The pipeline must also be at a suitable depth to ensure the stability of the flood defence structure, this is to be demonstrated in submitted designs;
- The scoping report states the pipeline will not cross our flood defence structure above ground. If this is to change, loading to our asset will need to be considered and the design must not impede access for routine maintenance and inspections of the flood defence structure;
- If the pipeline crosses a watercourse above ground, it must be appropriately designed and positioned to prevent accumulation of debris and localised increases in water levels;
- Where the pipeline is to utilise existing pipework that crosses watercourses, it is expected that modifications to the structure will be made where possible for improved conveyance and reduce debris accumulation; and
- Where ground levels near a flood defence are to be disturbed on either a permanent or temporary basis, designs must not allow additional water to pond at the toe of the flood defence.

Pipeline Construction

- Open trench methodology is not permitted when crossing a flood defence. Excavations near the footprint of a flood defence must remain a safe distance away from the toe of the defence to ensure stability of the defence. This must be demonstrated in submitted designs; and
- Directional drilling would be permitted when crossing a flood defence provided:
    - The drilling operation does not affect the stability of the flood defence structure by inducing a geotechnical failure, including when it is retaining flood water; and
    - The drilling or permanent works do not provide a conduit for water seepage underneath the flood defence structure, including when it is retaining flood water.

Pipeline Maintenance

- Repairs or future improvement works will be subject to an Environmental Permit from the EA if taking place within 16m of a flood defence; and
- Routine maintenance activities on the pipeline should be detailed within the DCO application.

Flood Defence Maintenance

In order to maintain the standard of protection, the EA requires continued access to continue routine maintenance of the existing and planned defences. Any permissions or legal agreements to allow these works to go ahead, must be agreed in advance of pipeline construction. It should be noted that the EA have statutory powers to carry out works on our assets.

Groundwater

The scoping report states there are no drinking water protected areas within 1km (or in Section 6.3.8, 15km) of the proposed development area. In terms of groundwater, all groundwater bodies in England are designated as drinking water protected areas. As such, the development area sits upon a groundwater drinking protected area. Further

information is available at Protect groundwater and prevent groundwater pollution - GOV.UK (www.gov.uk)

Section 8.1.1 of the scoping report scopes in surface water, geology, hydrogeology and contaminated land. This is welcomed.

We also support section 6.3.20 where it states 'potential impacts on groundwater flows during construction and operation phase (for below ground pipelines). There will be no direct discharges to groundwater. However, the potential for contaminant mobilisation from the Proposed Development and the resultant impacts to groundwater will be considered with the Geology and Hydrogeology assessments.'

In terms of SUDs, we would recommend that there is no increase in infiltration within the development area. This is to avoid the risk of contaminant mobilisation given the industrial heritage of the area. This ties into section 6.4.88 where the scope of assessment includes 'disturbance of contaminated soils and perched groundwater, and the creation of new pathways to sensitive receptors (including construction workers and controlled waters) during construction.'

The Water Environment (Water Framework Directive) (WFD) Regulations
The undertaking in section 6.3.33 to complete a WFD assessment is acknowledged and supported. At this stage, it is not certain that the matter of water quality will be a significant environmental concern. Therefore, the applicant should provide an assessment of the impact of the proposal on water quality in respect to the following waterbodies:

- Tees (GB510302509900)
- Tees Coastal (GB650301500005)
- Tees Estuary (South Bank) GB103025072320)

The WFD assessment will need to have regard to the Water Environment Regulations (WER) / WFD, and the Northumbria River Basin Management Plan (NRBMP).

The applicant should ensure that:

- The pipeline corridors do not add to the physical modification of the water environment unless equivalent appropriate mitigation measures are put in place; and
- Pipeline corridor routes and excavations should as far as practicable minimise or avoid the crossing of watercourses, and not run proximate and parallel to watercourses. In particular, pipeline corridors should not be situated so as to jeopardise the potential for restoration of intertidal and riverine habitats that support the recovery of the Teesmouth and Cleveland Coast SPA. Preferably pipeline corridors should follow existing physical modifications such as road infrastructure or existing pipeline corridors.

Table 6.1 provides a summary of the water features which the proposed development may interact. The inclusion of an undertaking to assess the potential impacts on non-reportable waterbodies and minor watercourses is acknowledged and supported.

For clarification of the statement at 6.3.9, the Teesmouth and Cleveland Coast SPA is within the Tees catchment where future development must be nutrient neutral to ensure no deterioration in WER (WFD) Dissolved Inorganic Nitrogen (DIN) element status. Reductions below the current baseline are required to achieve the protected area objectives.

Cont/d..

The undertaking in 6.3.20 (eighth bullet point) to evaluate options for discharge of effluents from the proposal, including consideration of nutrient neutrality is acknowledged and supported.

Similarly, the undertaking at 6.3.36 to carry out a Nutrient Neutrality Screening Assessment to assess likely impact on achievement of the targets for the WFD DIN element is acknowledged and supported. This should include the potential impact from emissions to air.

Scope

The scoping assessment of Major Accident Hazard and Disaster categories in Appendix B (page 213) scopes out 'Environmentally harmful liquid release' with commentary that, 'a release of aqueous ammonia or diesel which reached environmental receptors could have an impact, however the quantity present on site will likely be relatively small and impact would not reach the criteria for a MA&D therefore is scoped out.' It is recommended that the release of environmentally harmful liquid should be scoped into the assessment, in light of the international conservation designations of the surrounding water environment, their current condition assessment of unfavorable declining status, and the conservation objective of restore, including by meeting improved WFD DIN element status in the Tees estuary.

It is also recommended that the scoping assessment of 'road traffic accident (dangerous goods)' (page 214) should be scoped in to ensure that necessary mitigation is provided by way of appropriate design and operation of relevant drainage systems, the detail of which is yet to be confirmed.

Baseline conditions

Current Baseline

The Tees estuary currently fails to meet statutory environmental objectives set out in WFD legislation and the NRBMP. No deterioration of current quality is a minimum requirement of WER (WFD). Improvement and enhancement are also required to meet WFD objectives.

The Scoping Report identifies in section 2.2 that large areas of the proposed development site was historically intertidal habitat within the Tees estuary. The progressive infilling of the estuary, port development and subsequent flood protection modifications have contributed to the Tees estuary waterbody being designated as a Heavily Modified Waterbody (HMWB) under WFD. In order to achieve the overarching WFD objective of Good Ecological Potential (GEP) in HMWBs, mitigation measures must be taken to address the ongoing ecological impacts of such modifications, and prevent deterioration on this baseline. A Mitigation Measures Assessment has been undertaken and various information on appropriate mitigation measures is available. However, the limitations of the Catchment Data Explorer portal are such that this information cannot currently be provided through that platform.

Future Baseline

The Tees estuary is undergoing a period of ecological recovery after decades of industrial and sewage pollution. The future ecological baseline conditions are likely to be an improvement on the current conditions because of interventions already completed. Future baseline conditions will also be influenced by imminent legislation (Levelling Up Bill) and regulatory requirements (Water Company Price Review) that are likely to require significant reductions in the level of nutrients within the Tees estuary and within the timeframe of the proposed development. The area is also already subject

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to nutrient neutrality advice that aims to ensure no deterioration of current environmental conditions. The WFD assessment should therefore take account of such future baseline conditions.

Construction Environment Management Plan (CEMP)
The provision of a CEMP is welcomed. The CEMP should specifically outline how construction and surface run-off will be managed and potential impacts mitigated. The CEMP should also include, but not limited to, the following:

- Treatment and removal of suspended solids from surface water run-off during construction works.
- Approach to ensure no sewage pollution or misconnections.
- Approach to ensure water mains are not damaged during construction works.
- Management of fuel and chemical spills during construction and operation, including the process in place to ensure the environment is not detrimentally impacted in the event of a spill.
- Due to the presence of contaminated land, construction runoff is likely to contain hazardous chemicals and elements. A scheme may be required to manage the associated risks, and minimise mobilisation of hydrocarbons, heavy metals, and any other hazardous pollutants into the water environment during construction and site operation.

Foul drainage
We would expect to see the following points to be addressed within the DCO application:

- Confirmation of which sewage treatment works will receive the foul flows.
- Confirmation that there is sufficient capacity in the receiving Northumbrian Water network to accept the flows without increasing storm overflow spills.
- Confirmation that there is sufficient capacity at the receiving sewage treatment works (STW) to accept the flows while still operating within the permitted flow and quality limits.
- The applicant will need to produce their own WFD assessment to demonstrate the impact of the proposed development on the receiving watercourse.
- If there is insufficient capacity within the network or at the STW, details of an appropriate phasing approach for the development to enable the necessary upgrades to the sewage network before connecting the development should be provided.

Marine Ecology and Fisheries

Baseline conditions
We are generally satisfied with the assessment of the baseline conditions for both marine ecology and fish. However, the applicant should be aware that large areas adjacent to Greatham Creek, which have been classified as ‘Coastal and floodplain grazing marsh’ on Figure 12, are in fact coastal saltmarsh habitat as a result of the EA’s managed realignment projects of 2014 and 2018 respectively. These projects created 53 ha of saltmarsh. One of the proposed Hydrogen pipeline corridors dissects directly through the middle of this newly created habitat at the Greatham North site.
The areas of newly created saltmarsh habitat (misclassified as Coastal and floodplain grazing marsh) outlined in purple in Figure 12 require updating.

We are pleased to see that the applicant will be submitting a WFD assessment. The WFD assessment should also consider whether the proposed scheme, in combination

with other activities, will impact on WFD water body status. A cumulative impact can arise from the repeated occurrence of one pressure or from the simultaneous occurrence of many pressures. The resulting impact of a repeated or simultaneous pressures can have a greater impact than a single pressure. Pressures from multiple sources should therefore be considered including combined impacts of activities within the proposal, existing pressures, recent schemes and other planned schemes.

Fish entrainment
The scoping report highlights potential water sources as Demineralised water (DMW) from Wilton International or Reclaimed water (treated effluent) from Northumbrian Water Ltd's (NWL) Bran Sands Wastewater treatment plant. It is preferred that the abstraction from WFD waterbodies is avoided where possible to avoid the risk of fish entrainment. If abstraction from WFD waterbodies is proposed, the impact of fish entrainment should be assessed, and appropriate mitigation proposed to prevent entrainment. Screening to prevent ingress of fish is a requirement of both the Salmon and Freshwater Fisheries Act 1975 (SAFFA) and Eels (England and Wales) Regulations 2009.

Discharge of cooling waters
If cooling waters is discharged to the Tees estuary or other WFD waterbodies, the implications of this in relation to WFD status will need to be fully considered. Further details on the nature, volume, chemical and thermal properties of the effluent would be required. Thermal modelling will be required to assess the range of the thermal discharge. Sea temperature rise due to climate change over the operational lifespan of the and cumulative impacts from all thermal discharges within the Tees estuary should also be considered.

Effect of noise on fish
Anthropogenic noise can cause physical harm and behavioural responses (e.g. altered migration) in fish. It is unclear from the Scoping Report whether there is a potential for noise and/or vibration to occur during the creation of the hydrogen pipeline corridors. Therefore, the applicant should consider potential effects from noise and vibration on migratory fish. A noise assessment should be conducted for all methods being considered for use in the construction of the proposed hydrogen pipeline corridor under the river Tees. Further consideration should also be given to potential cumulative/in-combination impacts of noise on fish, as a result of other developments taking place in the area. If the assessment identifies potential impacts from noise and/or vibration on fish, suitable mitigation should be identified.

Water volves and otters
We are satisfied with the scope and proposed survey timescales and extents outlined in table 6.3 with respect to otters and water voles.

Proximity to landfill sites
The proposed development will interact with several areas of historic landfill and is also in close proximity to operational landfill sites (as identified in section 6.4 of the scoping report). The scoping report indicates that further assessment is to be undertaken to identify pollutions risks posed by the ground disturbance. It is important that this further work assesses the risks posed by any disturbance to ground in or around the existing historic and operational landfill sites. Landfill sites can generate leachate and landfill gas which pose a risk of harm to the environment. Historic landfill sites are generally not well engineered and, as such, may pose a greater risk of pollution if disturbed

Reuse of made ground
Use of made ground in development projects is often undertaken using the CL:AIRE

Definition of Waste Code of Practice (DoWCoP). This allows waste materials to be used outside of waste legislation, providing four key factors are met relating to certainty of use, quantity used, suitability for use and the environment and human health is protected.

Reuse of the made ground on this development site is unlikely to be suitable for use under the DoWCoP. This is because the material is likely to consist of blast furnace slag and other historic contaminants. As such, reuse of the material would not be considered low risk for use under the DoWCoP as it presents a risk of causing pollution to the environment. We would therefore recommend that an Environmental Permit is sought to authorise and condition any proposed reuse of the made ground. We would encourage the developer to request pre-application advice to discuss permitting options further: Get advice before you apply for an environmental permit - GOV.UK (www.gov.uk)

Other comments
Figure 14 shows potential receptors. It is recommended North Tees Mudflats should be included as a potential receptor.

EA and Partner Projects
The EA and partners are bringing forward a programme of projects designed to mitigate the ongoing ecological impact of historical physical modifications on the Tees estuary and tributaries. The current Programme is scheduled to be completed by the commissioning date of the proposed development.

The DCO should not jeopardise attainment of these WFD mitigation measures. Therefore, the developer may wish to support these projects so as to demonstrate appropriate mitigation of any impacts, or to secure betterment of the local environment:

- The Tees Tidelands Programme is led by the EA and Stockton-on-Tees Borough Council, and consists of a number of projects that aim to restore intertidal habitats and ecologically reconnect the Tees estuary to tributaries.
- The EA Seal Sands SSSI restoration project is initially focusing on building a Tees estuary baseline hydraulic model, but in the future also seeks to identify the prioritised physical interventions to manage excess growth of macroalgae.
- The Tees Rivers Trust (TRT) are undertaking a Tees Estuary Edges project to install a suite of bio-engineered designs that enhance ecology in the highly modified Tees navigation channel.
- TRT are also undertaking species (oyster, seagrass, mussel) reintroduction projects at locations within Tees Bay and the estuary.
- The Canal and River Trust (CRT) are developing designs to secure enhanced fish passage across the Tees Barrage and so throughout the Tees catchment.

EA Consents and requirements

Flood Risk Permit
The River Tees is a designated ‘main river’ and under the Environmental Permitting Regulations certain works within 16m of a tidal main river, or within 16m of any flood defence structure on a tidal main river, require a Flood Risk Activity Permit from the Environment Agency. Assessments are required for both the temporary and permanent works. This includes works such as but not limited to; directional drilling under the River Tees, construction of outfalls, ground raising and works to construct and maintain the pipeline. You can find more information on permit requirements using the following link: Flood risk activities: environmental permits - GOV.UK (www.gov.uk). If a permit is required, it must be obtained prior to beginning the works.

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Water Quality Permit
You do not require a permit if you are only discharging uncontaminated surface runoff. If you intend to discharge to surface water for dewatering purposes, this may be covered by a Regulatory Position Statement (RPS) for water discharge activities. If you can comply with all the conditions within the RPS, then a permit is not required for this activity. Further information is available at Temporary dewatering from excavations to surface water: RPS 261 - GOV.UK (www.gov.uk).

Discharges that do not fully comply with the RPS, will require a bespoke discharge permit will be required. Guidance on applying for a bespoke water discharge permit is available at Discharges to surface water and groundwater: environmental permits - GOV.UK (www.gov.uk).

Water Resources Consent
If you intend to abstract more than 20 cubic metres of water per day from a surface water source e.g. a stream or from underground strata (via borehole or well) for any particular purpose then you will need an abstraction licence from the Environment Agency. There is no guarantee that a licence will be granted as this is dependent on available water resources and existing protected rights.

Dewatering is the removal/abstraction of water (predominantly, but not confined to, groundwater) to locally lower water levels near the excavation. This can allow operations to take place, such as mining, quarrying, building, engineering works or other operations, whether underground or on the surface. The dewatering activities on-site could have an impact upon local wells, water supplies and/or nearby watercourses and environmental interests. This activity was previously exempt from requiring an abstraction licence. Since 1 January 2018, most cases of new planned dewatering operations above 20 cubic metres a day will require a water abstraction licence from us prior to the commencement of dewatering activities at the site. Further information is available at Apply for a water abstraction or impounding licence - GOV.UK (www.gov.uk)

Environmental Permitting Regulations
This development will require an Environmental Permitting Regulation (EPR) permit, see below for details on applicable section of Environmental Permitting (England and Wales) Regulations 2016. When appropriate we would encourage enhanced pre-app advice is sought in a timely manner, ahead of any submission for a EPR permit application. The timeline for processing of the permit is changeable and it is advisable that the operator consults with the EA on a regular basis during the project.

Control of Major Accident Hazards (COMAH) Regulations 2015
There is no indication of volume/ tonnage of hazardous chemicals which the Operator intends to store on site. Therefore, the Operator should refer directly to COMAH Regulations 2015 Part 1 Schedule 1 and Part 2 Schedule 1 and assess their status under COMAH. Diesel fuel is mentioned (ref 34 Petroleum products “including diesel fuel oils”).

End

H2

Consideration should be made of the millions so recently invested at Greatham Creek and Marsh House by the Environment Agency. This was compensating for loss elsewhere and is still developing towards its true environmental potential. Environmental impact in this transformational area cannot be based only on what has only just begun to establish today.

Timing of any works needs to be avoid environmental impact on nesting and migrating birds and the seal population.

Public Right of Ways (PROWs) in the vicinity of Greatham – linking Greatham South to the Tees Road and South West to Cowpen Bewley. As well as protecting these valued routes the potential for enhancement should be considered. Eg. While always preferable that pipelines are hidden underground, if a pipeline crosses a waterway by bridge could this provide a new PROW route to access such as the Cowpen Landfill which will promises a new attractive environmental asset.

Historic landfill between Marsh House Farm and Greatham Creek plus PROW on Thorn Tree Lane, Greatham not shown on map figure 10

Consultation in Greatham to explain in layman's terms the proposals for the pipeline in between Greatham village and Greatham Creek would be welcomed.

Neighbourhoods & Regulatory Services

Civic Centre Level 1
Hartlepool TS24 8AY

Email: developmentcontrol@hartlepool.gov.uk

Tel: 01429 266522
DX60669 Hartlepool-1

Our Ref: H/2023/0109

Contact Officer: Stephanie Bell ☎ [redacted]

9 May 2023

THE PLANNING INSPECTORATE
ENVIRONMENTAL SERVICES
OPERATIONS 3 GROUP
TEMPLE QUAY HOUSE
2 THE SQUARE
BRISTOL
BS1 6PN

Dear Sir/Madam

TOWN AND COUNTRY PLANNING ACT 1990

PROPOSAL: **Adjoining Authority Consultation for Request from Planning Inspectorate for LPA's view on Scoping Opinion submitted in respect of an Application by H2 Teesside Ltd (the Applicant) for an Order granting Development Consent for the H2Teesside Project (the Proposed Development)**

LOCATION: **LAND WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON ON TEES AND HARTLEPOOL**

I refer to the above noted application.

I can confirm that Hartlepool Borough Council have no comments to make on the Scoping Opinion submitted in respect of an Application by H2 Teesside Ltd (the Applicant) for an Order granting Development Consent for the H2Teesside Project (the Proposed Development), at land within the boroughs of Redcar and Cleveland and Stockton on Tees and Hartlepool.

I have sought the view of internal colleagues and can confirm that Tees Archaeology agree with the proposed scoping methodology for cultural heritage, namely that cultural heritage will be scoped into the Environmental Statement and that a cultural heritage DBA will be produced. The Council's Economic Growth team Economic Growth are aware of this project and support the proposal. The development would bring local supply chain opportunities for local businesses and job opportunities for local people.

If you would like any further information about the Council's decision please contact your case officer Stephanie Bell quoting the reference number given above.

Hartlepool Borough Council will collect and process personal information in line with our legal obligations, details of which can be found on our web site www.hartlepool.gov.uk/GDPR or by telephoning 01429 266522. Personal

Information will be handled in accordance with the General Data Protection Regulation.

Yours faithfully

Stephanie Bell
Senior Planning Officer

Historic England

Ms Laura Feekins-Bate
The Planning Inspectorate
by email

Direct Dial: [redacted]

Our ref: PL00792835
Your ref: **EN070009**

9 May 2023

Dear Ms Feekins-Bate

Re: Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) - Regulations 10 and 11

REQUEST FOR SCOPING OPINION: EN070009 - Application by H2 Teesside Ltd for an Order granting Development Consent for the H2Teesside Project, Land at and in the vicinity of the former Redcar Steel Works site, Redcar and in Stockton-on-Tees, Teesside

Thank you for your letter of 11 April 2023 consulting Historic England about the above EIA Scoping Report.

The proposed development is for the construction, operation (including maintenance where relevant) and decommissioning of a 1.2 Gigawatt Thermal (GWth) Hydrogen Production Facility with associated Carbon Capture and hydrogen transport pipeline network on the former Steelworks land in Redcar and Cleveland. This development could potentially have an impact upon numerous designated and undesignated heritage assets and their settings.

In line with the advice in the National Planning Policy Framework (NPPF 2021) and the relevant National Policy Statements (NPS), we would expect the Environmental Statement to contain a thorough assessment of the likely effects the proposed development might have upon those elements which contribute to the significance of these assets.

We would like to draw attention to the specific NPS documents and their policies in relation to the historic environment. We would expect to see these referred to in the cultural heritage section of the ES to show how the application complies with them.

Our initial assessment broadly tallies with the baseline conditions set out in the scoping report section 6.11 (the discrepancy is likely due to slight differences in mapping of the site area polygon):

- 54 Grade I and II* listed structures;
- 463 Gr. IIs;
- 27 Scheduled Monuments;
- 1 Gr.II* Registered Park and Garden;
- 1 Gr. II Registered Park and Garden, and
- 23 Conservation Areas.

We concur that there are no highly designated heritage assets within the red-line boundary. However, we note that there are circa 700 non-designated heritage assets both within the boundary and the defined 1km study area.

The scoping report proposes that maritime cultural heritage issues are scoped out. The proposed pipeline across the Tees will be bored and therefore will not impact any maritime heritage assets in this area. We concur that it is unlikely that there will be any significant impacts on marine cultural heritage by this proposal as noted in 6.11.18 and consequently that marine heritage can be scoped out.

However, it is clear that the terrestrial cultural heritage must be scoped into the EIA as there could be impacts to known heritage assets. At present the potential for currently unrecorded heritage assets is not known and should also be included in the assessment.

We would also expect the Environmental Statement to consider the potential impacts on non-designated features of historic, architectural, archaeological or artistic interest, since these can also be of national importance and make an important contribution to the character and local distinctiveness of an area and its sense of place. This information is available via the Redcar and Cleveland Historic Environment Record and relevant local authority staff as they are best placed to advise on:

- the local historic environment issues and priorities;
- how the proposal can be tailored to avoid and minimise potential adverse impacts on the historic environment;
- the nature and design of any required mitigation measures; and
- opportunities for securing wider benefits for the future conservation and management of heritage assets.

We would expect the assessment to clearly demonstrate that the extent of the proposed study area is of the appropriate size to ensure that all heritage assets likely to be affected by this development have been included and can be properly assessed.

It is important that the assessment is designed to ensure that all impacts are fully understood. Pre-determination archaeological evaluation such as geophysical surveys and other evaluation techniques may assist with determination of archaeological potential and ground truthing of desk-based data.

The assessment should also take account of the potential impact associated activities (such as construction, servicing and maintenance, and associated traffic) might have upon perceptions, understanding and appreciation of the heritage assets in the area. The assessment should also consider, where appropriate, the likelihood of alterations to drainage patterns that might lead to in situ decomposition or destruction of below ground archaeological remains and deposits and can also lead to subsidence of buildings and monuments.

Position

On the basis of the information in the Scoping Report, the proposal is unlikely to have significant impacts on highly designated cultural heritage assets. We suggest that the applicant should seek advice from and liaise closely with the Local Planning Authority's Heritage / Archaeology Advisors for this application.

We anticipate, subject to seeing the assessment of impacts set out in the ES, that our involvement in this Nationally Important Infrastructure Project may be limited in nature.

Yours sincerely,

Lee McFarlane
Inspector of Ancient Monuments
[redacted]@HistoricEngland.org.uk

cc: Tim Brown, Conservation Advisor, Redcar & Cleveland Borough Council

Feekins-Bate, Laura

From: Peter Wilson [redacted]@middlesbrough.gov.uk>
Sent: 18 April 2023 15:22
To: H2Teesside
Cc: H2Teesside
Subject: FW: EN070009 - H2Teesside - EIA Scoping Notification and Consultation
Attachments: H2TE - Statutory consultation letter.pdf

Good afternoon Laura

Thank you for the email consulting Middlesbrough on the proposed H2Teesside Project.

Having thoroughly considered the detailed report, there are no objections or other comments at this stage from Middlesbrough.

Regards

Peter Wilson
Principal Planning Officer

Address: Development Control | Middlesbrough Council | Fountain Court, 119 Grange Road | Middlesbrough | TS1 2DT
Email: [redacted]@middlesbrough.gov.uk
Telephone: [redacted]

www.middlesbrough.gov.uk

Our values: Passion Integrity Creativity Collaboration Focus

From: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Sent: Tuesday, 11 April 2023 10:19
To: Development Control <developmentcontrol@middlesbrough.gov.uk>
Cc: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Subject: EN070009 - H2Teesside - EIA Scoping Notification and Consultation

FAO Head of Planning

Dear Sir / Madam

Please see attached correspondence on the proposed H2Teesside project.

Please note that the deadline for consultation responses is **9 May 2023**, and is a statutory requirement that cannot be extended.

Kind regards
Laura

Laura Feekins-Bate
EIA Advisor
The Planning Inspectorate

The Planning Inspectorate

@PINSgov The Planning Inspectorate planninginspectorate.gov.uk

Ensuring **fairness**, **openness** and **impartiality** across all our services

National Grid House
Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA

Complex Land Rights
Ellie Laycock
Development Liaison Officer
UK Land and Property
[redacted]@nationalgrid.com
Tel: [redacted]

www.nationalgrid.com

SUBMITTED ELECTRONICALLY:
h2teesside@planninginspectorate.gov.uk

02 May 2023

Dear Sir/Madam

APPLICATION BY H2 TEESIDE LTD (THE APPLICANT) FOR AN ORDER GRANTING DEVELOPMENT CONSENT FOR THE H2TEESIDE PROJECT (THE PROPOSED DEVELOPMENT)

SCOPING CONSULTATION RESPONSE

I refer to your letter dated 11th April 2023 in relation to the above proposed application. This is a response on behalf of National Grid Electricity Transmission PLC (NGET). Having reviewed the scoping report, I would like to make the following comments regarding NGET infrastructure within or in close proximity to the current red line boundary.

NGET has high voltage electricity overhead transmission lines, underground cables and a high voltage substation within the scoping area. The overhead lines and substation form an essential part of the electricity transmission network in England and Wales.

Substation

- Saltholme 275kV Substation
- Tod Point 275kV Susbtation
- Associated overhead and underground apparatus including cables

Overhead Lines

4TH 275kV OHL	Hartlepool – Saltholme
	Hartlepool – Tod Point
4TG 275kV OHL	Hartlepool – West Boldon
	Hartlepool – Hartmoor
ZZA 400kV OHL	Hartlepool – West Boldon
	Hartlepool – Hartmoor
	Hartlepool – Saltholme
	Hartlepool – Tod Point
	Lackenby – Norton
	Hartlepool – Tod Point

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Warwick Technology Park
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CV34 6DA

YYJ 400kV OHL	Lackenby – Norton 1
	Norton – Saltholme
YYQ 275kV OHL	Hartlepool – Tod Point
	Lackenby – Tod Point

Associated underground apparatus including cables

Cable Apparatus

- Grangetown - Lackenby 275kV underground cable

I enclose a plan showing the location of NGET's apparatus in the scoping area.

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Specific Comments – Electricity Infrastructure:

- NGET's Overhead Line/s is protected by a Deed of Easement/Wayleave Agreement which provides full right of access to retain, maintain, repair and inspect our asset

- Statutory electrical safety clearances must be maintained at all times. Any proposed buildings must not be closer than 5.3m to the lowest conductor. NGET recommends that no permanent structures are built directly beneath overhead lines. These distances are set out in EN 43 – 8 Technical Specification for "overhead line clearances Issue 3 (2004)".

- If any changes in ground levels are proposed either beneath or in close proximity to our existing overhead lines then this would serve to reduce the safety clearances for such overhead lines. Safe clearances for existing overhead lines must be maintained in all circumstances.

- The relevant guidance in relation to working safely near to existing overhead lines is contained within the Health and Safety Executive's (www.hse.gov.uk) Guidance Note GS 6 "Avoidance of Danger from Overhead Electric Lines" and all relevant site staff should make sure that they are both aware of and understand this guidance.

- Plant, machinery, equipment, buildings or scaffolding should not encroach within 5.3 metres of any of our high voltage conductors when those conductors are under their worse conditions of maximum "sag" and "swing" and overhead line profile (maximum "sag" and "swing") drawings should be obtained using the contact details above.

- If a landscaping scheme is proposed as part of the proposal, we request that only slow and low growing species of trees and shrubs are planted beneath and adjacent to the existing overhead line to reduce the risk of growth to a height which compromises statutory safety clearances.

- Drilling or excavation works should not be undertaken if they have the potential to disturb or adversely affect the foundations or "pillars of support" of any existing tower. These foundations always extend beyond the base area of the existing tower and foundation ("pillar of support") drawings can be obtained using the contact details above.

- NGET high voltage underground cables are protected by a Deed of Grant; Easement; Wayleave Agreement or the provisions of the New Roads and Street Works Act. These provisions provide NGET full right of access to retain, maintain, repair and inspect our assets. Hence we require that no permanent / temporary structures are to be built over our cables or within the easement strip. Any such proposals should be discussed and agreed with NGET prior to any works taking place.

- Ground levels above our cables must not be altered in any way. Any alterations to the depth of our cables will subsequently alter the rating of the circuit and can compromise the reliability, efficiency and safety of our electricity network and requires consultation with National Grid prior to any such changes in both level and construction being implemented.

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Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA

To download a copy of the HSE Guidance HS(G)47, please use the following link:
http://www.hse.gov.uk/pubns/books/hsg47.htm

Further Advice

We would request that the potential impact of the proposed scheme on NGET's existing assets as set out above and including any proposed diversions is considered in any subsequent reports, including in the Environmental Statement, and as part of any subsequent application.

Where any diversion of apparatus may be required to facilitate a scheme, NGET is unable to give any certainty with the regard to diversions until such time as adequate conceptual design studies have been undertaken by NGET. Further information relating to this can be obtained by contacting the email address below.

Where the promoter intends to acquire land, extinguish rights, or interfere with any of NGET apparatus, protective provisions will be required in a form acceptable to it to be included within the DCO.

NGET requests to be consulted at the earliest stages to ensure that the most appropriate protective provisions are included within the DCO application to safeguard the integrity of our apparatus and to remove the requirement for objection. All consultations should be sent to the following email address: **box.landandacquisitions@nationalgrid.com**

I hope the above information is useful. If you require any further information, please do not hesitate to contact me.

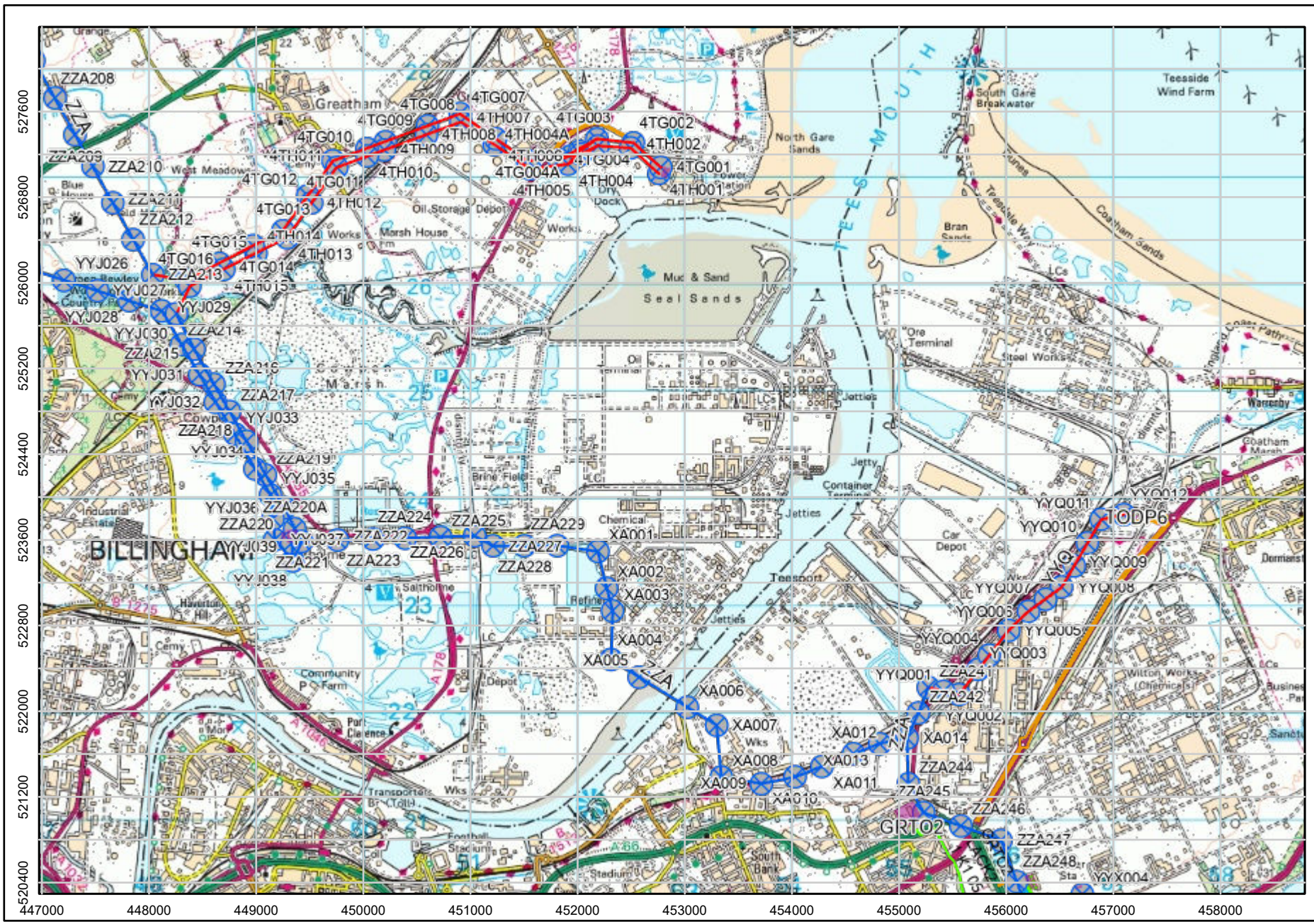
The information in this letter is provided not withstanding any discussions taking place in relation to connections with electricity customer services.

Yours faithfully

E.Laycock

Ellie Laycock
Development Liaison Officer, Complex Land Rights

nationalgrid | National Grid Web Map



Legend

Cable Accessories
- Pilot Cable

Fibre Cable
- Fibre Cable Commissioned

Buried Cable
- Buried Cable Commissioned

Towers
- Towers Commissioned

OHL 275Kv
- OHL 275Kv Commissioned

OHL 400Kv
- OHL 400Kv Commissioned

Substations
- Substations Commissioned

Notes

0 0.4 0.8 1.6 2.4 3.2 km

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Woodger-Bassford, Jade

From: NATS Safeguarding <NATSSafeguarding@nats.co.uk>
Sent: 18 April 2023 08:14
To: H2Teesside
Subject: RE: EN070009 - H2Teesside - EIA Scoping Notification and Consultation [SG35165]

Our Ref: SG35165

Dear Sir/ Madam

NATS anticipates no impact from the proposal and has no comments to make on the Scoping notification.

Yours faithfully

NATS Safeguarding

E: natssafeguarding@nats.co.uk

4000 Parkway, Whiteley,
Fareham, Hants PO15 7FL
www.nats.co.uk

NATS Public

From: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Sent: 11 April 2023 09:13
To: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Subject: EN070009 - H2Teesside - EIA Scoping Notification and Consultation

Dear Sir/ Madam

Please see attached correspondence on the proposed H2Teesside project.

Please note that the deadline for consultation responses is **9 May 2023**, and is a statutory requirement that cannot be extended.

Kind regards
Laura

The Planning Inspectorate

Laura Feekins-Bate
EIA Advisor
The Planning Inspectorate

@PINSgov The Planning Inspectorate planninginspectorate.gov.uk

Ensuring **fairness**, **openness** and **impartiality** across all our services

DPC:76616c646f72

Holdings Ltd (company number 4138218). All companies are registered in England and their registered office is at 4000 Parkway, Whiteley, Fareham, Hampshire, PO15 7FL.

Date: 09 May 2023
Our ref: 429363
Your ref: **EN070009**

Environmental Services
Operations Group 3
Temple Quay House
2 The Square Bristol,
BS1 6PN
For the attention of Laura Feekins-Bate

BY EMAIL ONLY

Consultations
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

T 0300 060 900

Dear Laura,

Environmental Impact Assessment Scoping consultation under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulation 11

Proposal: Application by H2 Teesside Ltd (the Applicant) for an Order granting Development Consent for the H2Teesside Project (the Proposed Development)

Thank you for seeking our advice on the scope of the Environmental Statement (ES) in the consultation dated 11 April 2023, which we received on the same day.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

A robust assessment of environmental impacts and opportunities, based on relevant and up to date environmental information, should be undertaken prior to an application for a Development Consent Order. Annex A to this letter provides Natural England's advice on the scope of the Environmental Impact Assessment (EIA) for the proposed development.

Natural England is engaged in ongoing pre-application dialogue with the applicant's consultant team ('the applicant'). Section 7.4[1] of the EIA scoping report refers. Our dialogue to date has been high level and focused primarily on ecological survey requirements for the scheme's current red line boundary. We acknowledge and welcome the applicant's clear reference to the preliminary status of the red line boundary and reference to the 'Rochdale envelope' principle accordingly. In view of the high level and geographically focused nature of dialogue so far we are unable to provide detailed comments on direct and indirect impact pathways relating to the designated sites listed in section 6.6[2] of the scoping report.

Detailed advice on scoping the Environmental Statement is available in the attached Annex.

[1] 7.4 - Consultation on the EIA
[2] 6.6 - Ecology and nature conservation - including aquatic ecology

For any further advice on this consultation please contact me using email – [redacted]@naturalengland.org.uk - and copy to consultations@naturalengland.org.uk.

Yours sincerely

Antony Muller
Senior Adviser – Northumbria Area Team

Annex A – Natural England Advice on EIA Scoping

1. General Principles

Based on the content of the EIA Scoping report and our dialogue with the applicant so far Natural England is satisfied that the general principles laid out within Regulation 11 of the Infrastructure Planning Regulations 2017 - (The EIA Regulations) are being addressed.

We note that significant elements of the proposal have yet to be confirmed (Selection of main site location and hydrogen pipeline route corridors). We welcome the applicant's clear reference to the preliminary status of the red line boundary and reference to the 'Rochdale envelope' principle accordingly.

2. Cumulative and in-combination effects

Natural England acknowledges the applicant's description of projects[3] needing to be assessed for cumulative and in combination effects alongside the proposal. We are not aware of additional projects needing assessment.

We draw the examining authority's attention to the need for and benefits of an early consideration of the proposal's relationship with wider environmental issues in the Tees estuary e.g. the nutrient neutrality theme and the wider need to restore water quality in the Tees catchment to achieve favourable condition of relevant water dependent designated sites such as the Teesmouth & Cleveland Coast Special Protection Area (SPA). For further information please see our comments under Section 9 Water Quality. Further relevant references are made within section 4 (Biodiversity & Geodiversity), with respect to ecological impact pathways for designated sites and Section 10 Climate Change – delivering mitigation and building resilience.

3. Environmental data

At the time of writing Natural England is arranging to provide the applicant with wild bird survey data for the 'Seal Sands' part of the Teesmouth & Cleveland Coast Special Protection Area (SPA).

Similarly we are checking the scope for use of the Great Crested Newt District Level Licensing scheme in relation to land within (or up to 250m from) the red line boundary lying north of the River Tees.

4. Biodiversity and Geodiversity

The assessment will need to include potential impacts of the proposal upon sites and features of nature conservation interest. We welcome the applicant's approach to gathering relevant data so far and for their reference to including opportunities for nature recovery through biodiversity net gain (BNG)[4].

[3] Figure 15 'Other Developments to be Considered in the Cumulative Impact Assessment (Indicative)' and supporting paragraphs)
[4] EIA Scoping Report - paragraph 6.6.32

4.1 Designated nature conservation sites

4.1.1 International and European sites

The development site is within or may impact on the **European/internationally designated nature conservation sites set out in the table below.**

Aside from the Teesmouth & Cleveland Coast SPA and Ramsar Site the proposal would not appear likely to cause direct impacts upon Habitats Sites within 15km of the application site. Nevertheless, based on the information available so far uncertainty exists over the scope for impacts on sites within this distance threshold. The Habitats Sites listed below fall within 15km of the proposal and have been listed accordingly to allow consideration of indirect effects from the proposal. We welcome inclusion of the listed Habitats Sites within paragraph 6.6.6 accordingly. Figure 13 of EIA scoping report shows these sites' geographical distribution.

The ES should thoroughly assess the potential for the proposal to affect internationally designated sites of nature conservation importance / European sites, including marine sites where relevant. This includes Special Protection Areas (SPA), Special Areas of Conservation (SAC), listed Ramsar sites, candidate SAC and proposed SPA.

Article 6 (3) of the Habitats Directive requires an appropriate assessment where a plan or project is likely to have a significant effect upon a European Site, either individually or in combination with other plans or projects.

Table 1: Potential risk to International designated sites: the development is within or may impact on the following European/Internationally designated site(s)

Site name with link to conservation objective	**Features which the ES will need to consider**	**Potential impact pathways where further information/assessment is required.**
Teesmouth & Cleveland Coast SPA **Link - https://publications.naturalengland.org.uk/publication/6619918699069440**	Over-wintering/passage waterbirds and breeding sea birds – including named spp. Little Tern (Sterna albifrons), Sandwich Tern (Sterna sandvicensis), Knot (Calidris canutus islandica),	Uncertain pending confirmation of main site and route corridor selection – Example impact pathways likely to include water quality (construction phase pathways and operational discharges), air quality (pending confirmation of types of emissions to air) and wild bird disturbance (noise and vibration, movement, lighting)

	Redshank (Tringa totanus totanus) Plus overwintering waterbird assemblage	
North Yorkshire Moors SPA Link **-** **https://publications.naturalengland.org.uk/publication/6207512114102272**	Supporting habitats for Merlin (Falco columbarius) and Golden Plover (Pluvialis apricaria) Blanket bog, wet and dry heath.	Uncertain pending confirmation of emissions to air – potential indirect air quality impacts (see comments under North Yorkshire Moors SAC)
Northumbria Coast SPA Link - https://publications.naturalengland.org.uk/publication/6372874327687168	Supporting habitats for Arctic tern (Sterna paradisaea), Little tern , (Sterna albifrons), Purple sandpiper , (Calidris maritima maritima), Ruddy turnstone , (Arenaria interpres interpres) rocky shore (with associated boulder and cobble beaches)	Uncertain pending confirmation of emissions to air – potential indirect air quality impacts

	intertidal mudflats and sand flats	
North Yorkshire Moors SAC Link - https://publications.naturalengland.org.uk/publication/6048216608931840	Blanket bog, wet and dry heath	Uncertain pending confirmation of emissions to air – potential indirect air quality impacts
Durham Coast SAC Link – https://publications.naturalengland.org.uk/publication/4949450761961472	Magnesian limestone grasslands, tall-herb fen, seepage flushes and wind-pruned scrub	Uncertain pending confirmation of emissions to air – potential indirect air quality impacts
Castle Eden Dene SAC Link – https://publications.naturalengland.org.uk/publication/5362023844020224	Yew (Taxus baccata) dominated woodland	Uncertain pending confirmation of emissions to air – potential indirect air quality impacts
Teesmouth & Cleveland Coast Ramsar site Ramsar site info sheet - https://jncc.gov.uk/jncc-assets/RIS/UK11068.pdf	Sand and mudflats, saltmarsh, freshwater marsh and sand dune habitats Common redshank (Tringa totanus totanus), Red knot (Calidris canutus islandica)	Uncertain pending confirmation of main site and route corridor selection – Example impact pathways likely to include water quality (surface water run off related, operational discharges), air quality (pending confirmation of types of emissions) and wild bird disturbance (noise and vibration, movement, lighting)
Northumbria Coast Ramsar site Ramsar site info sheet – Link - https://jncc.gov.uk/jncc-assets/RIS/UK11049.pdf	Rocky foreshore and sandy beach habitats Little tern , (Sterna albifrons albifrons), Purple sandpiper ,	Uncertain pending confirmation of emissions to air – potential indirect air quality impacts

	(Calidris maritima maritima), Ruddy turnstone , (Arenaria interpres interpres)	

4.1.2 Marine ecology (ref Section 6.8)

In relation to the proposal's potential impacts on the marine environment we have the following preliminary comments:

Trenchless technologies:

- Horizontal Directional Drilling (HHD) – we note that this is the most likely option that the applicant proposes to use. We agree it has less impacts compared with trenching.
- With all HDD there is a risk of 'frac-out' i.e. where the fracking fluid breaks through the surface and settles on the substrate (in this case intertidal/ subtidal mud and saltmarsh)
- Frac-out poses a risk to benthos habitats as it can cause smothering. In addition however, the clean-up operation can cause more damage. Examples include vehicles driving on the habitat and efforts to dig up the frac-out liquid removing or damaging the habitat underneath.
- We recommend that the Construction and Environmental Management Plan (CEMP) or equivalent should include a frac-out contingency plan and a pollution incident response plan. These should detail the clean-up operation. We would expect to be consulted on the CEMP later in the DCO process

Unexploded ordnance (UXO):

- The EIA scoping report is contradictory. Paragraph 6.8.27 suggests that UXO clearance measures are unlikely but Table B1 includes relevant screening measures. We would recommend that such measures are included. If not an explanation of the reasoning for omitting these measures should be provided.

Fish:

- Entrapment and entrainment within the water cooling system poses a risk to fish. Uptake of water for the water cooling system should consider all life stages of fish species and reduce fish entrainment.

Water cooling system:

- An assessment for fish is needed when assessing this element of the proposal.
- We welcome the proposal to assess the water that will be discharged and that the applicant will follow current guidelines and process. A criterion focusing on water temperature will need to be included.

Invasive non-native species (INNS)

- We note the applicant's reference to INNS and would advise a biosecurity plan, making sure everything brought to site (material/ gear/ water) has been assessed for INNS.

Hard structures

- Hard structures (pipe outflow, rock armouring or equivalent) need to be assessed in the context not only of loss of habitat, but also potential changes in coastal processes and introduction of INNS.

4.2 Nationally designated sites

4.2.1 Sites of Special Scientific Interest

Natural England welcomes the applicant's approach to scoping whereby the hierarchy of designated and local wildlife sites has been considered holistically using a 15Km area of search.

Aside from the Teesmouth & Cleveland Coast SSSI the proposal would not appear likely to cause direct impacts upon SSSIs within 15km of the application site. Nevertheless, based on the information available so far uncertainty exists over the scope for impacts on sites within this distance threshold. The SSSIs listed below fall within 15km of the proposal and have been listed accordingly to allow consideration of indirect effects from the proposal. Typical ecological impact pathways for consideration include air quality impacts arising from road transport (construction phase) and aerial emissions during the operational phase.

We welcome the scoping report's reference to these designated sites at paragraph 6.6.6. Figure 13 shows these sites' geographical distribution.

The Environmental Statement should include a full assessment of the direct and indirect effects of the development on the features of special interest within the SSSIs and identify appropriate mitigation measures to avoid, minimise or reduce any adverse significant effects. We welcome the applicant's proposal to include consideration of these effects within the Ecological impact assessment (EcIA).

Natural England's SSSI Impact Risk Zones can be used to help identify the potential for the development to impact on a SSSI. The dataset and user guidance can be accessed from the Natural England Open Data Geoportal

SSSI site names with link to citation
Teesmouth and Cleveland Coast SSSI (Inc Teesmouth National Nature Reserve NNR) https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000255&SiteName=Durham%20Coast&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Lovell Hill Pools SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S2000387&SiteName=Lovell%20Hill%20Pools&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Briarcroft pasture SSSI https://designatedsites.naturalengland.org.uk/SiteList.aspx?siteName=Briarcroft%20pasture&countyCode=&responsiblePerson=&DesignationType=SSSI
Roseberry Topping SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000120&SiteName=Roseberry%20topping&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

North York Moors SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S2000356&SiteName=North%20York%20Moors&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Saltburn Gill SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000289&SiteName=Saltburn%20Gill&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Whitton Bridge Pasture SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S2000474&SiteName=Whitton%20Bridge%20pasture&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Langbaurgh Ridge SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000256&SiteName=Langbaurgh%20&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Cliff Ridge SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1003961&SiteName=Cliff%20Ridge%20&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Durham Coast SSSI (Inc Durham Coast NNR) https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000255&SiteName=Durham%20Coast&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Hart Bog SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000052&SiteName=Hart%20bog&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Pike Whin Bog SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000785&SiteName=Pike%20Whin%20bog&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Kildale Hall SSSI https://designatedsites.naturalengland.org.uk/SiteList.aspx?siteName=Kildale%20Hall&countyCode=&responsiblePerson=&DesignationType=SSSI
Hulam Fen SSSI https://designatedsites.naturalengland.org.uk/SiteList.aspx?siteName=Kildale%20Hall&countyCode=&responsiblePerson=&DesignationType=SSSI
Castle Eden Dene SSSI (inc Castle Eden Dene NNR) https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000738&SiteName=Castle%20Eden%20Dene&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Pinkney and Gerrick Woods SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000085&SiteName=Pinkney%20and%20Gerrick&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Fishburn Grassland SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1006457&SiteName=Fishburn%20grassland&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

Charity Land SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S2000338&SiteName=Charity%20Land&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Newton Ketton Meadow SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1005078&SiteName=Newton%20Ketton&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Boulby Quarries SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000219&SiteName=Boulby%20Quarries&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

4.3 Regionally and Locally Important Sites

Natural England notes and welcomes the EIA scoping report's reference to Local Sites at paragraph 6.6.8. Local Sites are identified by the local wildlife trust, geoconservation group or other local group. The Tees Valley Wildlife Trust and Tees Valley Nature Partnership may be able to provide relevant information:

TVWT – email: info@teeswildlife.org Tel 01287 636382

TV LNP – Website - https://teesvalleynaturepartnership.org.uk/ - Email – Rachel Murtagh Nature Partnership Manager – [redacted]@teeswildlife.org

4.4 Protected Species

The ES should assess the impact of all phases of the proposal on protected species (including, for example, great crested newt, reptiles, birds, otter, water vole, badger and bats - paragraph 6.6.14 refers). Natural England does not hold comprehensive information regarding the locations of species protected by law. Records of protected species should be obtained from appropriate local biological record centres, nature conservation organisations and local groups. The applicant should consider the wider context of the site, for example in terms of habitat linkages and protected species populations in the wider area.

The area likely to be affected by the development should be thoroughly surveyed by competent ecologists at appropriate times of year for relevant species and the survey results, impact assessments and appropriate accompanying mitigation strategies included as part of the ES. Surveys should always be carried out in optimal survey time periods and to current guidance by suitably qualified and, where necessary, licensed, consultants.

We note and welcome the information presented in Table 6.3 accordingly.

Natural England has adopted standing advice for protected species, which includes guidance on survey and mitigation measures. A separate protected species licence from Natural England or Defra may also be required (For example for European Protected Species and badgers – Link - NE wildlife licences).

Applicants can also make use of Natural England's (NE) charged service Pre Submission Screening Service for a review of a draft wildlife licence application. NE then reviews a full draft licence application to issue a Letter of No Impediment (LONI) which explains that based on the information reviewed to date, that it sees no impediment to a licence being granted in the future should the DCO be issued.

NB - Please see our advice below regarding district level licensing for great crested newts.

The ES will need to consider the following **Protected Species:**

- great crested newt,
- reptiles,
- birds,
- otter,
- water vole,
- badger
- bats

4.5 District Level Licensing for Great Crested Newts

Natural England is aware that the applicant is interested in district level licensing for relevant land (within the red line boundary or relevant distance threshold for gt crested newt waterbodies). We will continue in dialogue with the applicant accordingly.

For reference, where strategic approaches such as district level licensing (DLL) for great crested newts (GCN) are used, a letter of no impediment (LONI) will not be required. Instead, the developer will need to provide evidence to the Examining Authority (ExA) on how and where this approach has been used in relation to the proposal, which must include a counter-signed Impact Assessment and Conservation Payment Certificate (IACPC) from Natural England.

The DLL approach is underpinned by a strategic area assessment which includes the identification of risk zones, strategic opportunity area maps and a mechanism to ensure adequate compensation is provided regardless of the level of impact. In addition, Natural England will undertake an impact assessment, the outcome of which will be documented in the IACPC.

If no GCN surveys have been undertaken, Natural England's risk zone modelling may be relied upon. During the impact assessment, Natural England will inform the Applicant whether their scheme is within one of the amber risk zones and therefore whether the Proposed Development is likely to have a significant effect on GCN. The IACPC will also provide additional detail including information on the Proposed Development's impact on GCN and the appropriate compensation required.

4.6 Priority Habitats and Species

Priority Habitats and Species are of particular importance for nature conservation and included in the England Biodiversity List published under section 41 of the Natural Environment and Rural Communities Act 2006. Consideration should also be given to the potential environmental value of brownfield sites, often found in urban areas and former industrial land. This is of special relevance to the application site, whose red line boundary contains a significant resource of '**open mosaic habitat**' associated with the area's industrial land use. We therefore welcome the clear presentation of such information in Figure 12 – **'**Ecological Constraints within 1 km of the Proposed Development Site Boundary'.

The Environmental Statement should include details of:

- Any historical data for the site affected by the proposal (e.g. from previous surveys)
- Additional surveys carried out as part of this proposal
- The habitats and species present
- The status of these habitats and species (e.g. whether priority species or habitat)
- The direct and indirect effects of the development upon those habitats and species
- Full details of any mitigation or compensation measures
- Opportunities for biodiversity net gain or other environmental enhancement

4.7 Biodiversity net gain

The ES should use an appropriate biodiversity metric such as Biodiversity Metric 4.0 together with ecological advice to calculate the change in biodiversity resulting from proposed development and demonstrate how proposals can achieve a net gain.

Link to Biodiversity Metric 4.0 information - https://publications.naturalengland.org.uk/publication/6049804846366720

The metric should be used to:
• assess or audit the biodiversity unit value of land within the application area
• calculate the losses and gains in biodiversity unit value resulting from proposed development
• demonstrate that the required percentage biodiversity net gain will be achieved

Biodiversity Net Gain outcomes can be achieved on-site, off-site or through a combination of both. On-site provision should be considered first. Delivery should create or enhance habitats of equal or higher value. When delivering net gain, opportunities should be sought to link delivery to relevant plans or strategies e.g. Green Infrastructure Strategies or Local Nature Recovery Strategies. These are prepared by local planning authorities.

Natural England is engaged in ongoing dialogue with the applicant over BNG.

5 Landscape

5.1 Landscape and visual impacts

The proposal lies approximately 9Km north of the **North York Moors National Park**. The associated **Cleveland Way national trail** (please see also 'Connecting People with Nature', below) traverses the northern edge of the park and offers elevated views northwards towards the Tees estuary from viewpoints such as Roseberry Topping. We note that the proposed stacks at the chosen main site are expected to reach approximately 100m in height and so careful consideration of design will help to avoid significant environmental effects.

Consideration should be given to the direct and indirect effects on this designated landscape and in particular the effect upon its purpose for designation. The management plan for the designated landscape may also have relevant information that should be considered in the EIA.

We welcome the EIA scoping report's reference to the relevant National Character Areas. These character area profiles set out descriptions of each landscape area and statements of environmental opportunity.

The EIA should include a full assessment of the potential impacts of the development on local landscape character using landscape assessment methodologies. We encourage the use of Landscape Character Assessment (LCA), based on the good practice guidelines produced jointly by the Landscape Institute and Institute of Environmental Assessment in 2013. LCA provides a sound basis for guiding, informing, and understanding the ability of any location to accommodate change and to make positive proposals for conserving, enhancing or regenerating character.

A landscape and visual impact assessment should also be carried out for the proposed development and surrounding area. Natural England recommends use of the methodology set out in *Guidelines for Landscape and Visual Impact Assessment 2013 (*(3rd edition) produced by the Landscape Institute and the Institute of Environmental Assessment and Management. For National Parks and AONBs, we advise that the assessment also includes effects on the 'special qualities' of the designated landscape, as set out in the statutory management plan for the area. These identify the particular landscape and related characteristics which underpin the natural beauty of the area and its designation status.

The assessment should also include the cumulative effect of the development with other relevant existing or proposed developments in the area. This should include an assessment of the impacts of other proposals currently at scoping stage.

To ensure high quality development that responds to and enhances local landscape character and distinctiveness, the siting and design of the proposed development should reflect local characteristics and, wherever possible, use local materials. Account should be taken of local design policies, design codes and guides as well as guidance in the National Design Guide and National Model Design Code. The ES should set out the measures to be taken to ensure the development will deliver high standards of design and green infrastructure. It should also set out detail of layout alternatives, where appropriate, with a justification of the selected option in terms of landscape impact and benefit.

The National Infrastructure Commission has also produced Design Principles Design Principles for National Infrastructure - NIC endorsed by Government in the National Infrastructure Strategy.

6 Connecting People with nature

The ES should consider the potential impacts on the **Cleveland Way National Trail** and the **England Coast Path**. We welcome the inclusion of the coast path and local rights of way in Figure 10 – 'Environmental Constraints within 1 km of the Proposed Development Site Boundary'. The National Trails website www.nationaltrail.co.uk provides further information.

The ES should consider potential impacts on access land, common land, public rights of way, the England Coast Path and coastal access routes and coastal margin in the vicinity of the development, in line with NPPF paragraph 100. It should assess the scope to mitigate for any adverse impacts. Rights of Way Improvement Plans (ROWIP) can be used to identify public rights of way within or adjacent to the proposed site that should be maintained or enhanced. Links to other green networks and, where appropriate, urban fringe areas should also be explored to help promote the creation of wider green infrastructure.

7 Soils and Agricultural Land Quality

Soils are a valuable, finite natural resource and should also be considered for the ecosystem services they provide, including for food production, water storage and flood mitigation, as a carbon store, reservoir of biodiversity and buffer against pollution. It is therefore important that the soil resources are protected and sustainably managed. Guidance is set out in the Natural England Guide to assessing development proposals on agricultural land.

With regard to best and most versatile land[5] we note the EIA scoping report's proposal that due to the temporary impacts associated with the hydrogen pipeline corridor's development no impact assessment is required. Natural England would draw the Examining Authority's attention to National Policy Statement EN4[6] paragraph 2.23.7 setting out the need for a suitable approach to mitigation of impacts on soil resources.

The following information sources are relevant:
Link - Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites and
The British Society of Soil Science Guidance Note Benefitting from Soil Management in Development and Construction.

8 Air Quality

Air quality in the UK has improved over recent decades but air pollution remains a significant issue. For example, approximately 85% of protected nature conservation sites are currently in exceedance of nitrogen levels where harm is expected (critical load) and approximately 87% of sites exceed the level of ammonia where harm is expected for lower plants (critical level of 1µg) [1]. A priority action in the England Biodiversity Strategy is to reduce air pollution impacts on biodiversity. The Government's Clean Air Strategy also has a number of targets to reduce emissions including to reduce damaging deposition of reactive forms of nitrogen by 17% over England's protected priority sensitive habitats by 2030, to reduce emissions of ammonia against the 2005 baseline by 16% by 2030 and to reduce emissions of NOx and SO_2 against a 2005 baseline of 73% and 88% respectively by 2030. Shared Nitrogen Action Plans (SNAPs) have also been identified as a tool to reduce environmental damage from air pollution.

Construction phase
We welcome detailed assessment of road traffic emissions and refer the applicant to our guidance for public bodies to help assess the impacts of road traffic emissions to air quality capable of affecting European Sites:
Link - Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations - NEA001.
Please note that the methodological approach set out in our guidance applies similarly to Sites of Special Scientific Interest despite the differing legislative regimes for Habitats Sites and SSSIs.

[5] Paragraphs 6.12.13-14 and 6.12.22
[6] 'Gas supply infrastructure and gas and oil supply pipelines'
[1] Report: Trends Report 2020: Trends in critical load and critical level exceedances in the UK - Defra, UK

Operational phase
Natural England notes that the applicant's EIA scoping report screens out the proposal's pipelines and connections from the Environmental Statement (paragraph 6.2.25).

We welcome screening in of the operational process at paragraph 6.2.24.
We refer the applicant to the Air Pollution Information System at www.apis.ac.uk for information on baseline levels and loads at specific designated sites for a range of pollutants recorded nationally.

The Environment Agency Screening Tool for industrial emissions can be found at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

9 Water Quality and Nutrient Neutrality

In March 2022 Natural England advised local planning authorities that the Teesmouth & Cleveland Coast Special Protection Area (SPA) and Ramsar site was considered to be in an unfavourable condition due to nutrient enrichment, specifically nitrogen.

The Teesmouth & Cleveland Coast SPA and Ramsar site includes areas of the River Tees channel, the Tees Estuary, and the Tees Bay. Natural England's advice is that qualifying bird species are being negatively affected by the growth of algal mats on their key foraging habitats within the Tees Estuary, particularly at Seal Sands.

As such, Natural England's Nutrient Neutrality advice is that new developments should not result in additional nitrogen entering the catchment of the River Tees upstream of the SPA and Ramsar site (i.e. they are nutrient neutral). Further information is available at the following link: Strategic Solutions: Nutrient Neutrality (naturalengland.org.uk)

This advice applies primarily to development involving overnight accommodation i.e. it focuses on additional volumes of treated wastewater arising as a result of new house building. However in order to restore the SPA to favourable condition the wider effects of nutrient inputs into the Tees hydrological catchment are also relevant. The link below provides further context: https://www.gov.uk/government/publications/nutrient-pollution-reducing-the-impact-on-protected-sites/nutrient-pollution-reducing-the-impact-on-protected-sites

As a result we note and welcome the applicant's recognition of the nutrient pollution theme (paragraphs 6.3.35-37). The Habitats Regulations Assessment (HRA) process provides the means to assess the proposal and we acknowledge paragraphs 6.6.27-31 accordingly. Natural England looks forward to continued dialogue with the applicant to progress this element of the proposal.

10 Climate Change

Natural England notes and acknowledges the proposal's primary purpose i.e. to produce low carbon hydrogen and capture and store carbon. Paragraph 1.1.2 (Introduction) refers.

In terms of climate change mitigation over and above the scheme's primary purpose the proposal also offers scope to:

(i) Deliver nature recovery/enhancement
(ii) Build ecosystem resilience through careful planning and implementation e.g. with reference to consideration of ongoing wider efforts to restore water quality in the Tees estuary. These include but are not restricted to the provisions of the Levelling up and Regeneration Bill which requires relevant water companies to upgrade the performance of wastewater treatment works to 'technically achievable limits' by 2030.

The applicant should explore opportunities to achieve a design solution that optimises the scope to deliver relevant technological advances and land management in the local area over the development's lifetime

NORTH YORKSHIRE COUNCIL

H2 Teeside Limited
Building E
Chertsey Road
Sunbury On Thames
Middlesex
W16 7BP

Planning Services (Scarborough Area)
North Yorkshire Council
Town Hall
St Nicholas Street
Scarborough
North Yorkshire
YO11 2HG
Tel: 0300 131 2 131
Email: planning.services.sca@northyorks.gov.uk
Web: www.northyorks.gov.uk

Our Ref ZF23/00692/OA
Date 24 April 2023

Proposal EIA Scoping Notification and Consultation - EN070009
Site Address H2 Teeside

I refer to the above consultation which was received at this office on 14 April 2023.

NYC as a Local Planning Authority makes no comment

If you require any further assistance please contact me at the above address.

Yours faithfully

Planning Services

Woodger-Bassford, Jade

From: Before You Dig <BeforeYouDig@northerngas.co.uk>
Sent: 12 April 2023 09:58
To: H2Teesside
Subject: RE: EXT:EN070009 - H2Teesside - EIA Scoping Notification and Consultation

Follow Up Flag: Follow up
Flag Status: Completed

Good Morning,

NGN has a number of gas assets in the vicinity of some of the identified "site development" locations. It is a possibility that some of these sites could be recorded as Major Accident Hazard Pipelines(MAHP), whilst other sites could contain High Pressure gas and as such there are Industry recognised restrictions associated to these installations which would effectively preclude close and certain types of development. The regulations now include "Population Density Restrictions" or limits within certain distances of some of our "HP" assets.

The gas assets mentioned above form part of the Northern Gas Networks "bulk supply" High Pressure Gas Transmission" system and are registered with the HSE as Major Accident Hazard Pipelines.
Any damage or disruption to these assets is likely to give rise to grave safety, environmental and security of supply issues.

NGN would expect you or anyone involved with the site (or any future developer) to take these restrictions into account and apply them as necessary in consultation with ourselves. We would be happy to discuss specific sites further or provide more details at your locations as necessary.

If you give specific site locations, we would be happy to provide gas maps of the area which include the locations of our assets.
(In terms of High Pressure gas pipelines, the routes of our MAHP's have already been lodged with members of the local Council's Planning Department)

Kind regards,

Lucy McMahon

Administration Assistant
Before You Dig
Northern Gas Networks
1st Floor, 1 Emperor Way
Doxford Park
Sunderland
SR3 3XR

Before You Dig: 0800 040 7766 (option 5)
www.northerngasnetworks.co.uk
facebook.com/northerngasnetworks
twitter.com/ngngas
Alternative contact:
beforeyoudig@northerngas.co.uk

Get involved! Have your say in the future of your gas network and win great prizes, by taking part in our BIG customer survey at together.northerngasnetworks.co.uk Keep posted to take part in a range of activities from workshops to roadshows. Together, we are the network.

From: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Sent: 11 April 2023 09:13
To: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Subject: EXT:EN070009 - H2Teesside - EIA Scoping Notification and Consultation

Dear Sir/ Madam

Please see attached correspondence on the proposed H2Teesside project.

Please note that the deadline for consultation responses is **9 May 2023**, and is a statutory requirement that cannot be extended.

Kind regards
Laura

The Planning Inspectorate

Laura Feekins-Bate
EIA Advisor
The Planning Inspectorate

Our Customer Privacy Notice sets out how we handle personal data in accordance with the law.

Please take a moment to review the **Planning Inspectorate's Privacy Notice** which can be accessed by clicking this link.

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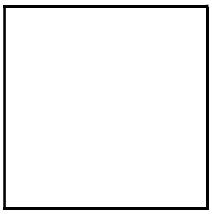


Redcar & Cleveland Borough Council
Corporate Directorate of Growth, Enterprise and Environment
Redcar and Cleveland House
Kirkleatham Street
Redcar
TS10 1RT
01642 774774
[redacted]@redcar-cleveland.gov.uk
www.redcar-cleveland.gov.uk

Environmental Services
Operations Group 3
Temple Quay House
2 The Square
Bristol, BS1 6P

Our Ref: R/2023/0300/DCO
Your Ref: EN070009
Contact: Adrian Miller
Direct Line: [redacted]
Mob: [redacted]

Date: 4 May 2023

Dear Mr Sir / Madam,

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulations 10 and 11

Application by H2 Teesside Ltd (the Applicant) for an Order granting Development Consent for the H2Teesside Project (the Proposed Development)

General Approach (Application for an Environmental Impact Assessment Scoping Opinion)

The Scoping document submitted is considered to be an appropriate approach to the preparation of an ES. The general structure and format is considered acceptable setting out;

- A background to the development
- Description of the existing environment
- The proposed Development
- Consideration of Alternatives
- Planning Policy and Need

- Potentially Significant Environmental Effects

- EIA process and
- Summary

The overall approach to the ES is considered acceptable as are the range of topic areas to be assessed under section 6 (Potentially Significant Environmental Effects) subject to the detailed comments received and set out below from consultees to the process. The Scoping report sets out in detail, the approach to be taken to the preparation of the ES and is considered to be a robust and comprehensive assessment of that process. The LPA at this stage does not see the need to materially alter or add to the approach taken in the Scoping Report in terms of the matters to be covered or the methodology.

Detailed comments from consultees

(1) Redcar and Cleveland Council service teams

Environmental Protection (Nuisance)

With reference to the above planning application, I would confirm that I have assessed the following environmental impacts which are relevant to the development and would comment as follows:

Chapter 6.5 of H2 Teesside Ltd Environmental Impact Assessment Scoping Report concerns Noise and Vibration.

The report states that baseline noise data is available from the results of surveys which were undertaken in 2019 and 2020 for the NZT Project (immediately east of the Proposed Development Sites). From a review of the available data, the existing dominant sound in the area is from industrial and road traffic noise sources, however further project specific baseline noise monitoring will be carried out to inform the noise and vibration assessment for the Proposed Development.

I have no objections to the methodology and scope for further assessment stated in the report.

Environmental Protection (Air Quality)

Chapter 6.2 of H2 Teesside Ltd Environmental Impact Assessment Scoping

Report concerns Air Quality.
I have no objections to the methodology and scope for further assessment stated in the report.

Environmental Protection (Contamination)

With reference to the above planning application, I would confirm that I have assessed the following environmental impacts which are relevant to the development and would comment as follows:

Chapter 6.4 H2 Teesside Ltd Environmental Impact Assessment Scoping Report concerns contaminated land.

The chapter describes the baseline geology together with historic contaminative use along the main sites and pipe corridors and potential impacts to human health and controlled waters from the proposed development.

A Phase 1 desk-based assessment (DBA) has been completed for Main Site A and a similar DBA is being prepared for Main site B.

In order to minimise the environmental impact and fully characterise the site I would recommend the inclusion of the full Standard Contaminated Land condition onto any planning permission which may be granted:

REASON: To ensure that risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors.

Natural Heritage Manager

No comments

(2) External Stakeholder responses

SABIC Pipeline Operator

Many thanks for your notification of request dated 13 April 2023 for planning reference, R/2023/0300/DCO, at the above address.

The proposed development appears to be located in the inner, middle and outer zone of the above Major Accident Hazard Pipeline as defined by the HSE development control guidelines (PADHI – HSE's Land Use Planning Methodology document).

In terms of the safety and engineering integrity of the pipeline I would advise you that SABIC is consulted should any work within 50 metres (notification zone as required by operators of Major Accident Hazard Pipelines) is to be carried out, as this would need approval from ourselves before any work is commenced.

Should planning consent be granted, we would require to consult fully with the developer prior to construction commencing on the site to agree a method statement and ensure that our standard conditions for work in close proximity to the pipeline are met.

Northern Gas Networks

There are high pressure mains within the area so we would object to this. The link you have provided is to a document with 249 pages so can you please pinpoint the areas and provide grids for each one? – please see below:

NGN has a number of gas assets in the vicinity of some of the identified "site development" locations. It is a possibility that some of these sites could be recorded as Major Accident Hazard Pipelines(MAHP), whilst other sites could contain High Pressure gas and as such there are Industry recognised restrictions associated to these installations which would effectively preclude close and certain types of development. The regulations now include "Population Density Restrictions" or limits within certain distances of some of our "HP" assets.

The gas assets mentioned above form part of the Northern Gas Networks "bulk supply" High Pressure Gas Transmission" system and are registered with the HSE as Major Accident Hazard Pipelines.

Any damage or disruption to these assets is likely to give rise to grave safety, environmental and security of supply issues.

NGN would expect you or anyone involved with the site (or any future developer) to take these restrictions into account and apply them as necessary in consultation with ourselves. We would be happy to discuss specific sites further or provide more details at your locations as necessary. If you give specific site locations, we would be happy to provide gas maps of the area which include the locations of our assets.

(In terms of High-Pressure gas pipelines, the routes of our MAHP's have already been lodged with members of the local Council's Planning Department)

Highways England

See attached technical note

CATS North Sea

Thank you for your notification request dated 13 April 2023 in respect of planning reference R/2023/0300/DCO, at the above noted address.

The proposed development is located in proximity to the CATS terminal and pipeline (the "CATS Infrastructure"). CATS North Sea Limited ("CNSL") should be consulted in respect of any work or activities within 50 metres of the CATS Infrastructure and no such work should be commenced without the prior approval of CNSL. The safety and engineering considerations, so far as relevant to the Environmental Statement, should take account of the CATS Pipeline and any restriction zones. The application for development consent will need to ensure any risks to, or associated with, the CATS Infrastructure are suitably mitigated. CNSL will engage further in the planning process in this regard.

CNSL has no additional comments at this stage on the proposed scope of the Environmental Statement but will continue to engage with the planning process and the make comments and representations at relevant stages.

Natural England

We have since been consulted separately by the Planning Inspectorate and will submit our advice letter direct to them on 9.5.23.

Cleveland Police ALO

With regards to this application, I recommend applicant/agent contact me at earliest opportunity for any advice/guidance I can offer and to liaise with any other departments within Cleveland Police that should be aware of proposal.

Yours sincerely

Adrian Miller BA (Hons) Dip TP MRTPI
Head of Planning and Development

Lynne Aspery

From: Planning Admin
Subject: FW: DCO Scoping Response - R/2023/0300/DCO - H2 Teesside Project
Attachments: DevTV0162 TM001 - Final.pdf

From: Christopher Bell (NO, North East) [redacted]@nationalhighways.co.uk>
Sent: 28 April 2023 11:15
To: Adrian Miller [redacted]@redcar-cleveland.gov.uk>
Cc: Subject: FW: DCO Scoping Response - R/2023/0300/DCO - H2 Teesside Project

Adrian,

Please find a technical note from JSJV, National Highways consultants, to advise at this pre-application / scoping stage on this proposed development in order to assist the developer in defining an appropriate assessment of the Strategic Road Network.

Regards

[redacted]

Chris Bell, Planning Manager
National Highways (formerly Highways England) | 2 City Walk | Leeds | LS11 9AT
Tel: [redacted]
Web: http://www.highways.gov.uk
GTN: 0300 470 2339

H2 Teesside Project – DCO Scoping

Prepared for:	Chris Bell
Prepared by:	Jack Fawdington
Date:	28th April 2023
Case Reference:	DevTV0162
Document Reference:	TM001
Reviewed/approved by:	Gavin Nicholson

Overview

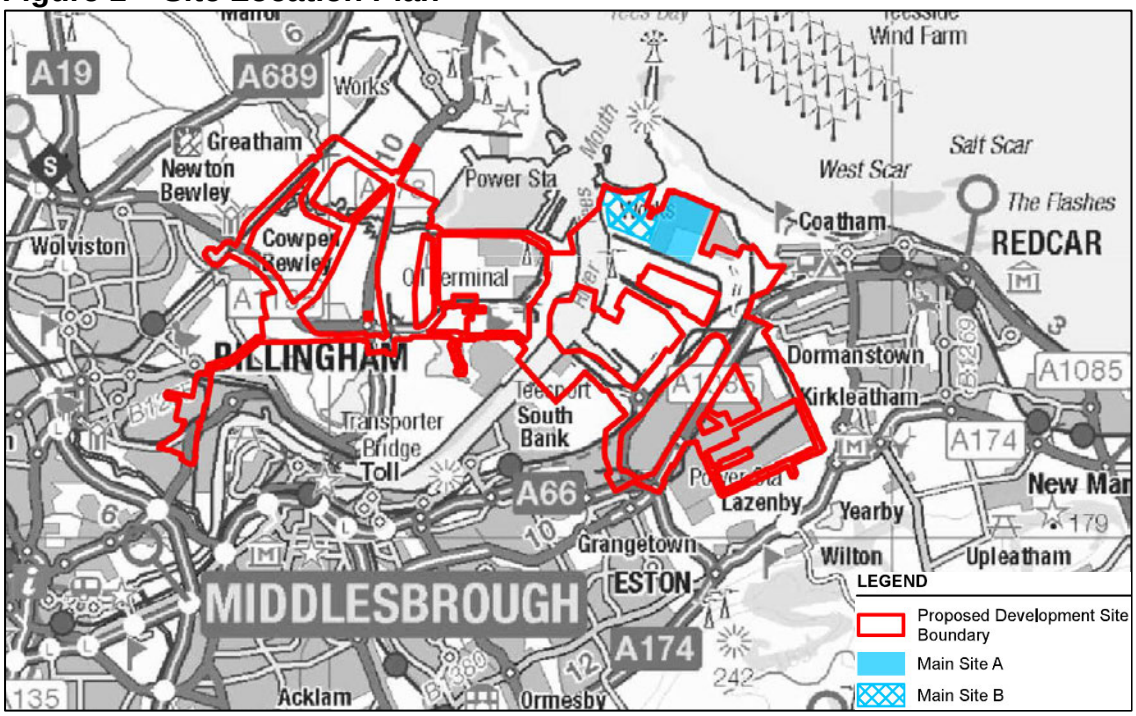
Jacobs Systra Joint Venture [JSJV] (on behalf of National Highways) has undertaken a review of an Environmental Impact Assessment [EIA] Scoping document (dated April 2023) submitted by H2 Teesside Limited [the Applicant] in reference to the proposed H2 Teesside Project at the former Redcar Steelworks site, Teesside. The H2 Teesside Project application has been classified as a Development Consent Order [DCO] (ref: R/2023/0300/DCO) due to the development being recognised by the Planning Inspectorate as a Nationally Significant Infrastructure Project.

This JSJV Technical Memorandum [TM] comments on the suitability of the EIA Scoping document with discussion provided in relation to whether the document suitably considers the impact of the development proposals upon the Strategic Road Network [SRN] across both the operational and construction phases of the development.

Site Location

The development site, located at the former Redcar Steelworks site, is composed of two proposed main sites, sites A and B, as detailed on Figure 1 below.

Figure 1 – Site Location Plan



(Source: EIA Scoping Submission Drawing – 'Figure 1')

Description of Existing Development

Proposed Development Site

The proposed development site is located primarily within the administrative boundaries of Redcar and Cleveland Borough Council [RCBC] and Stockton on Tees Borough Council [STBC]. The hydrogen pipeline corridor extends further north-west to include land within the administrative boundary of Hartlepool Borough Council [HBC] also. The proposed development site is split into distinct areas as summarised below:

- The Main Site (whether Site A or Site B) will be the location of the Production Facility together with the associated carbon capture and compression facilities and ancillary infrastructure.
- $C0^2$ Export Corridor: $C0^2$ captured from the process will be compressed at the Main Site and exported off shore for geological storage in the Southern North Sea.
- Hydrogen Pipeline Corridor: The pipeline network will connect to potential off-takers at various industrial installations across the Tees Valley.
- Natural Gases Connection Corridor: Pipelines required for the transportation of compressed gas from local sources for use in the hydrogen production process.
- Electrical Connection Corridor: To provide electrical power for the Production Facility via a connection to the National Grid Network.
- Water Connections Corridor: Required for water supply and discharge to / from the Production Facility.

Proposed Development

The proposed development comprises the construction, operation and maintenance of a 1.2 GWth Lower Heating Valve Carbon Capture and Storage [CSS] enabled Hydrogen Production Facility located in the Teesside industrial cluster area.

The Production Facility and associated infrastructure which form part of the proposed development will be located on the 'Main Site'. There are currently two Main Site options – Main Sites A and B. Main Site A would be located within land owned by Teesworks known as 'The Foundry'. Main Site B would be located to the west of Main Site A within land owned by Redcar Bulk Terminal, known as 'RBT'. Both Main Sites are located within the Redcar and Cleveland Borough, with the connection corridors extending further into Stockton-on-Tees and Hartlepool, all within Teesside.

At this stage in the design of the proposed development, there are still options being considered for various components. The design of the proposed development incorporates a necessary degree of flexibility to allow for the future selection of the preferred layout at the Main Site, as well as routing of the hydrogen pipeline and other connections.

Development Access

Access to the Main Sites during the construction phase for HGV construction traffic is likely to be via the existing access road from the A1085 (local highway network) via the former Redcar Steelworks entrance. This route will also be used during operation for staff and other site traffic. This applies to both Main Site A and Main Site B options.

Construction access routes for the hydrogen pipeline and connection corridors are yet to be defined by the Applicant. However, it is proposed that laydown areas will likely be identified at suitable locations along the pipeline routes located north of the River Tees to reduce potential disturbance. Moving forward, JSJV note that the location of both the construction laydown areas and the routing of HGV construction routes will need to be confirmed with National Highways, however, it is acknowledged that the proposed A1085 access point is unlikely to directly interact with the operation of the SRN.

Abnormal Indivisible Loads

Options for transportation of Abnormal Indivisible Loads [AIL]s during construction using the local ports are still being considered by the Applicant. The nearest commercial port to the proposed development site is Teesport which could be used for the import of containerised equipment or modular plant. The use of the existing wharf at RBT for transportation of abnormal loads is also proposed to be considered for modular plant. Consideration is also to be given to the appropriate port and any required AIL routes during the design process.

JSJV understands that the standard procedure for [AIL]s will be followed by the Applicant, however, it is noted that potential carriageway width, height and weight restrictions for the movement of such vehicles will need to be discussed and agreed with National Highways.

As such, JSJV would advise that the Applicant directly discusses any matters pertaining to AIL movements with the National Highways Abnormal Indivisible Loads team (AbnormalIndivisibleLoadsTeam@highwaysengland.co.uk).

Construction Programme & Management

As the development advances through the planning process, a detailed Environmental Statement [ES] will be submitted alongside a detailed Construction Environmental Management Plan [CEMP], which will describe the specific mitigation measures to be followed to reduce impacts from construction related activities.

The Construction of Phase 1 is likely to last approximately two years. Phase 2 works would commence thereafter (approximately late 2027/ early 2028) and last a further two to three years, with overall construction expected to be completed by late 2029 or early 2030. The potential impact of the construction of the proposed development at the SRN will also be discussed subsequently within this JSJV TM.

Staffing

Based on an initial estimate, it is proposed that the construction workforce peak numbers will be approximately 3,100 people per day across two distinct development phases. This includes workers associated with both the Main Site and pipeline connections.

Operational workforce peak numbers are proposed to be a maximum of 85 persons, working dedicated shifts over 24 hour periods. Typical staff numbers are expected to be 40 to 50 during the week, however, during 28 day maintenance periods (occurring every four years), around 400 staff may be on site.

With regards to on-site operational and construction staff, National Highways will require the expected two-way daily arrival / departure profile of staff trips to be confirmed by the Applicant. This is to ensure that the impact of the site at the SRN during the operational and construction phase can be assessed, quantified and managed if necessary.

With regards to the 28 day maintenance periods highlighted by the Applicant, JSJV recognise that these specific periods may likely incur an impact at the SRN as a result of greatly increased staff numbers. Consequently, JSJV would advise that a suitable control mechanism is agreed with National Highways through a form of Operational Traffic Management Plan [OTMP] for implementation during these periods to ensure staff trip generation can be managed and mitigated.

HGV Movements & Traffic

While the volume of construction vehicles associated with the delivery of plant and the labour force has not been fully determined at this stage, it is proposed that approximately 2,660 two-way vehicle movements will be generated per day during the peak construction period, based on an average car occupancy for workers of 2.33.

In terms of construction HGV and LGV movements, approximately 15,320 deliveries are expected to the Main Site over the full period of construction. In addition, there are also approximately 4,330 HGV movements expected to be associated with the construction of the development pipelines throughout the construction period, which equates to around 50 two-way movements per day during the peak month of construction.

National Highways will require confirmation of the expected ‘peak’ arrival / departure profile of construction vehicles, including construction staff, deliveries and associated movements during an identified ‘peak’ construction period, and how long this period may continue for, opposed to the generation of average movements or total daily / monthly movements. This is to ensure that any potential trip generation impact at the

SRN can be accurately quantified as the development advances through the construction phase.

Further detail will also need to be provided by the Applicant in relation to how it will be ensured that an average car occupancy rate of 2.33 will be achieved. This detail and the associated control mechanisms that will be required to control and mitigate the impact of the construction traffic at the SRN will need to be detailed in the Final Construction Traffic Management Plan [CTMP] submitted in support of the DCO.

In addition, the Applicant will need to confirm and evidence the anticipated routings and proportions that construction vehicles (including construction staff trips) will take to / from the site. Confirmation of the distribution of these trips is required by National Highways in order to understand which specific SRN junctions may be materially impacted by construction traffic.

Planning Policy

While not identified by the Applicant within the scoping document, National Highways will require any planning assessment to engage with and adhere to guidance contained within DfT Circular 01/2022: The Strategic Road Network and the Delivery of Sustainable Development. Circular 01/2022 sets out the way in which National Highways will engage with the development industry, public bodies and communities to assist the delivery of sustainable development. The circular is applicable to the whole of the SRN, comprising the trunk motorways and all-purpose trunk roads in England, including those roads managed by the design, build, finance and operate companies.

Environmental Impact Assessment Process

Traffic & Transportation

The scoping document identifies that in order to fully address the impacts of the construction phase on the highway network, a Transport Assessment [TA] will be produced by the Applicant following the confirmation of the specific number of construction movements associated with the proposed development. The scoping note identifies that appropriate liaison with the necessary local authorities and National Highways will be undertaken prior to TA submission.

The scope of the TA is proposed to cover the following areas:

- Review of appropriate transport policy.
- Description of baseline and future baseline conditions, including link and junction flows, a review of highway safety issues and consideration of accessibility by all modes.
- Calculation of construction traffic flows.
- Distribution and assignment of construction traffic flows to the highway network, including the identification of any AIL routes.
- Highway network impact analysis, with the identification of key junctions that may require detailed capacity analysis.
- Consideration of local PRoW network and the potential impact of the site on existing routes.

- Where the construction of the development may directly interact with existing road and / or rail links.
- The formulation of mitigation measures through both a Construction Worker Travel Plan [CWTP] and CTMP.

With reference to the preparation of the development TA, JSJV note that:

- The impact of the proposed development at the SRN over both the operational and construction phase must be understood in terms of absolute two-way flows over both morning / evening network peak hours. This is opposed to either total daily flows or proportional flows (percentage increase) in relation to baseline flows at any specific junction.
- National Highways will need to understand the trip distribution of site vehicles at the SRN associated with both the construction and operational phases of the proposed development. The study area should extend to any SRN junction where a potential impact needs to be considered (to aid discussions we suggest 30 two-way trips being a starting point for consideration).
- JSJV acknowledge that where the development (construction and / or operation) is evidenced to potentially incur a material impact at an SRN junction, appropriate collision analysis may be required.
- Where the development (construction and / operation) is evidenced to potentially incur a material impact at an SRN junction, an appropriate consideration of operational impacts and, if required, mitigation strategy, will need to be agreed with National Highways.
- National Highways will require confirmation as to where any sections of pipeline construction may interact with the SRN, i.e., where tunnelling or infrastructure works are undertaken either underneath or adjacent to the SRN. Further discussions will then be required with National Highways as to how such construction can be safety undertaken without compromising the operation or structural integrity of the SRN.
- While the production of a CWTP is welcomed by National Highways, JSJV note that a Travel Plan [TP] will also need to be prepared in relation to the operational aspect of the proposed development. Both CWTP and operational TP must outline a package of measures that will be utilised to promote and incentivise sustainable travel to / from the site, while committing to vehicle trip generation targets and a trip monitoring strategy. Detail should also be provided as to what remedial measures will be implemented should vehicular trip targets not be achieved.

In supplement, JSJV also note that the following measures will need to be taken into account by the Applicant in relation to the preparation of a CTMP for the proposed development:

- Identification of the approved haul routes to site and identification of measures to prevent the use of any unauthorised routes.
- Identification of the site access strategy.
- Identification of the proposed works programme by construction task.
- Identification of workforce numbers for the site and details of workforce travel arrangements (specifically with a view to achieving the 2.33 average car occupancy for workers that has been assumed within the initial provision of information).

- Details of site working hours and details of any exceptions (concrete pours etc).
- Measures to minimise wherever possible the use of public roads at peak periods whenever practicable (Morning and Evening Peak Hours and school start / finish times).
- Details of measures to reduce the number of delivery trips to site such as a combination of consolidated ordering, rationalising suppliers and consolidated deliveries.
- Details of measures to reduce on-site waste such as recycling and re-use of materials to minimise the number of collections from site.
- Vehicles carrying soil and other dusty materials to be fully sheeted when travelling to or leaving site.
- Use of on approved mechanical road sweeper to clean the surrounding road network of any mud or debris deposited by site vehicles. The road sweeper should be available whenever needed.
- Measures to safely manage pedestrians.
- Details for any temporary traffic management and warning signs.
- Details of a site liaison officer who will act as point of contact for the CTMP.
- Details regarding the monitoring the success of the CTMP and remedial measures which may be implemented should the CTMP not be achieving stated outcomes.

Relationship with other Planning Applications

Finally, JSJV recommends that National Highways should seek to ensure that the consideration, and subsequent delivery, of the proposals (if the DCO application is successful) is done so in a manner that is aligned with the approaches adopted and outcomes envisaged when other significant applications in the area have been considered. Clearly the aspirations outlined could have cumulative implications during both the construction and operational stages with other approved development proposals.

With a view to this, the following information is provided in relation to those permissions that are directly relatable to the proposals for this site:

- **R/2020/0821/ESM - Foundry Outline Application**

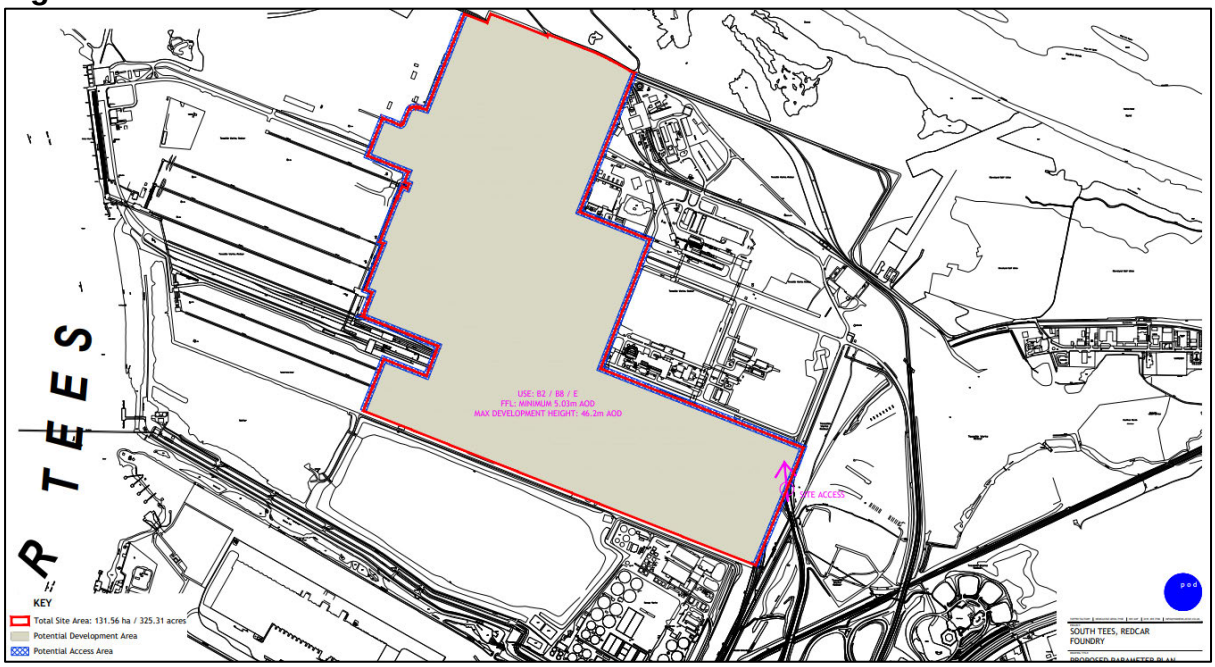
  Alongside four other significant applications made by the South Tees Development Corporation [STDC], this application has been granted with some requirements for SRN assessment and mitigation measures being the subject of a set of planning conditions.

  With a view to the site parameters plan for the Foundry application, which can be seen in Figure 2 below, it can be seen that the development boundaries contain areas that are subject to this DCO application (mainly related to the Main Site A component). National Highways would therefore request that information be provided that clarifies the relationship of the applications and developments proposed.

  Furthermore, with a view to the approach that has been established for the Foundry Outline permission (as controlled by the associated planning conditions), discussions should take place to confirm how the planning outcomes contained within the planning conditions associated with that Foundry Outline permission can

be achieved with regard to this proposal. It is recommended that discussions are held with the DCO applicant, the Local Planning Authority and STDC (as necessary - as the applicant to the outline Foundry permission) to understand the relationship between the development proposals and with a view to ensuring a holistic and consistent consideration of their outcomes.

Figure 2 – R/2020/0821/ESM – Site Parameters Plan

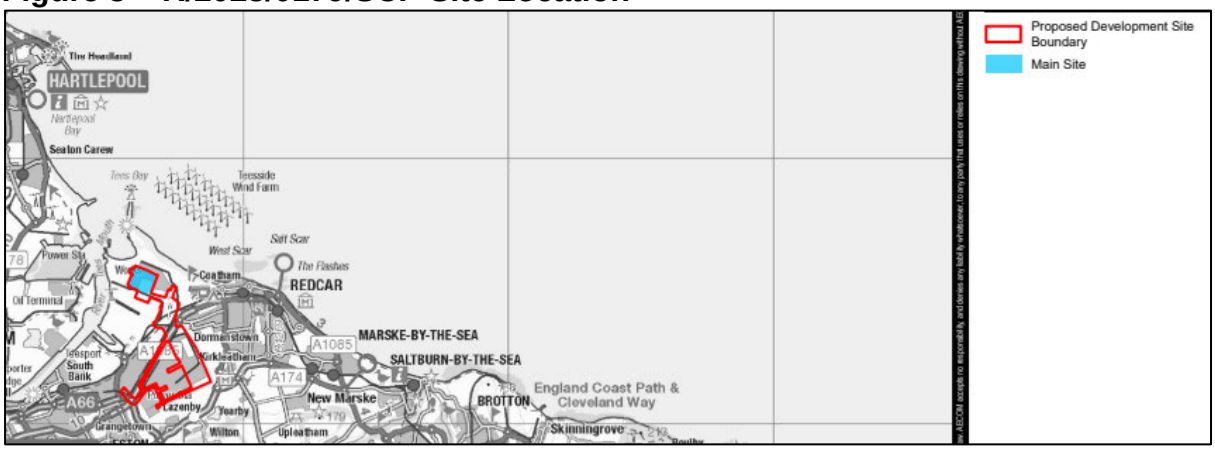


(Source: Planning Application R/2020/0821/ESM – Site Parameters Plan)

- **R/2023/0179/SCP – Hygreen Hydrogen Project**

  National Highways were consulted on the scoping opinion for the Hygreen Hydrogen Project to which initial headline comments were provided in early March 2023 (available on the Redcar and Cleveland Planning Portal for this application). With a view to the proposals form and boundary which can be seen in Figure 3 below, it can be seen that there are similarities in terms of the main site location and components of the development site boundary and that of the development being proposed in the DCO application (for the southern elements of the site boundary specifically). National Highways would therefore request that information be provided that clarifies the relationship of the applications and developments proposed.

Figure 3 – R/2023/0179/SCP Site Location



(Source: Planning Application R/2023/0179/SCP – Site Location Plan (AECOM))

Summary and Conclusions

On the basis of this review, the recommendation to National Highways in relation to this development proposals is:

Pre-application / Scoping Response – comments are made on the pre-application / scoping in order to assist defining an appropriate assessment of the Strategic Road Network.

This review has highlighted the following:

1) JSJV would advise that the Applicant directly discusses any matters pertaining to AIL movements with the National Highways Abnormal Indivisible Loads team (AbnormalIndivisibleLoadsTeam@highwaysengland.co.uk).
2) National Highways will require any planning assessment to engage with and adhere to guidance contained within DfT Circular 01/2022: The Strategic Road Network and the Delivery of Sustainable Development.
3) JSJV would advise that a suitable control mechanism is agreed with National Highways through a form of Operational Traffic Management Plan [OTMP] for implementation during the 28 day maintenance periods to ensure staff trip generation can be managed and mitigated.
4) National Highways will require confirmation of the expected 'peak' arrival / departure profile of construction vehicles, including construction staff, deliveries and associated movements during an identified 'peak' construction period, and how long this period may continue for, opposed to the generation of average movements or total daily / monthly movements.
5) The Applicant will need to confirm how it will be ensured that an average car occupancy rate of 2.33 will be achieved with regards to construction staff.
6) The Applicant will need to confirm and evidence the anticipated routings and proportions that construction vehicles (including construction staff trips) will take to / from the site. Confirmation of the distribution of these trips is required by National Highways in order to understand which specific SRN junctions may be materially impacted by construction traffic.

7) With reference to the preparation of the development TA, JSJV note that:
    a) The impact of the proposed development at the SRN over both the operational and construction phase must be understood in terms of absolute two-way flows over both morning / evening network peak hours. This is opposed to either total daily flows or proportional flows (percentage increase) in relation to baseline flows at any specific junction.
    b) National Highways will need to understand the trip distribution of site vehicles at the SRN associated with both the construction and operational phases of the proposed development. The study area should extend to any SRN junction where a potential impact needs to be considered (to aid discussions we suggest 30 two-way trips being a starting point for consideration).
    c) JSJV acknowledge that where the development (construction and / or operation) is evidenced to potentially incur a material impact at an SRN junction, appropriate collision analysis may be required.
    d) Where the development (construction and / operation) is evidenced to potentially incur a material impact at an SRN junction, an appropriate consideration of operational impacts and, if required, mitigation strategy, will need to be agreed with National Highways.
    e) National Highways will require confirmation as to where any sections of pipeline construction may interact with the SRN, i.e., where tunnelling or infrastructure works are undertaken either underneath or adjacent to the SRN. Further discussions will then be required with National Highways as to how such construction can be safety undertaken without compromising the operation or structural integrity of the SRN.
    f) While the production of a CWTP is welcomed by National Highways, JSJV note that a Travel Plan [TP] will also need to be prepared in relation to the operational aspect of the proposed development. Both CWTP and operational TP must outline a package of measures that will be utilised to promote and incentivise sustainable travel to / from the site, while committing to vehicle trip generation targets and a trip monitoring strategy. Detail should also be provided as to what remedial measures will be implemented should vehicular trip targets not be achieved.
8) The following measures will need to be taken into account by the Applicant in relation to the preparation of a CTMP for the proposed development:
    a) Identification of the approved haul routes to site and identification of measures to prevent the use of any unauthorised routes.
    b) Identification of the site access strategy.
    c) Identification of the proposed works programme by construction task.
    d) Identification of workforce numbers for the site and details of workforce travel arrangements (specifically with a view to achieving the 2.33 average car occupancy for workers that has been assumed within the initial provision of information).
    e) Details of site working hours and details of any exceptions (concrete pours etc).

f) Measures to minimise wherever possible the use of public roads at peak periods whenever practicable (Morning and Evening Peak Hours and school start / finish times).

g) Details of measures to reduce the number of delivery trips to site such as a combination of consolidated ordering, rationalising suppliers and consolidated deliveries.

h) Details of measures to reduce on-site waste such as recycling and re-use of materials to minimise the number of collections from site.

i) Vehicles carrying soil and other dusty materials to be fully sheeted when travelling to or leaving site.

j) Use of on approved mechanical road sweeper to clean the surrounding road network of any mud or debris deposited by site vehicles. The road sweeper should be available whenever needed.

k) Measures to safely manage pedestrians.

l) Details for any temporary traffic management and warning signs.

m) Details of a site liaison officer who will act as point of contact for the CTMP.

n) Details regarding the monitoring the success of the CTMP and remedial measures which may be implemented should the CTMP not be achieving stated outcomes.

9) JSJV recommends that National Highways should seek to ensure that the consideration, and subsequent delivery, of the proposals (if the DCO application is successful) is done so in a manner that is aligned with the approaches adopted and outcomes envisaged when other significant applications in the area have been considered. Clearly the aspirations outlined could have cumulative implications during both the construction and operational stages with a view to the following approved development proposals:

a. R/2020/0821/ESM – Foundry Outline Application.

b. R/2023/0179/SCP – Hygreen Hydrogen Project.

LICHFIELDS

The St. Nicholas Building
St. Nicholas Street
Newcastle upon Tyne NE1 1RF

0191 261 5685
newcastle@lichfields.uk
lichfields.uk

Laura Feekins-Bate
Planning Inspectorate
Environmental Services
Operations Group 3
Temple Quay House
2 The Square
Bristol
BS1 6PN

Date: 9 May 2023
Our ref: 63262/01/AGR/GB/26519535v1
Your ref: EN070009

Dear Laura

Response by Teesworks to EIA Scoping Report for H2Teesside Project

We write on behalf of our client, the South Tees Development Corporation (STDC) and South Tees Developments Limited (STDL). We write in reference to your letter dated 11 April 2023 inviting STDC, hereafter referred to as "Teesworks", to comment on the Environmental Impact Assessment ('EIA') Scoping Report in respect of the Development Consent Order (DCO) being prepared for the H2Teesside project. This letter comprises Teesworks' formal response to your request for comments on the EIA Scoping Report of the H2Teesside project.

As freehold owner, STDC has an interest in the land which is located within Main Site A ('also known as The Foundry') and, alongside STDL, areas within the Connection Corridors in the Proposed Development Site, shown within Figure 1 Site Location Plan which forms an Appendix to the EIA Scoping Report.

We have reviewed the EIA Scoping Report and wish to offer the following comments:

1 We agree with the topics proposed to be scoped into the ES set out in Section 6 'Potentially Significant Environmental Effects' and Section 8 'Summary and Matters to be Scoped Out' of the EIA Scoping Report.

2 We note the acknowledgement in para 5.6.5 which states that parts of the Proposed Development Site lie within the boundary of the South Tees Development Corporation area.

3 The commitment to consult stakeholders on final site selection as set out in para 2.1.4 of the EIA Scoping Report is crucial to the success of the project and our clients want to participate proactively and positively in this process. We therefore formally request that H2Teesside Ltd invites us to provide input into the appraisal and decision-making process on the Proposed DCO Boundary given this closely relates to on-going commercial discussions over land arrangements at Teesworks.

4 Paragraph 6.17.17 states:

STDC have recently submitted a number of planning applications in the vicinity of the Proposed Development Site, primarily for demolition works and engineering operations associated with ground remediation and preparation for regeneration and development. They are also in the process of preparing a number of planning applications for development of general industry (Use Class B2) and storage or distribution facilities (Use Class B8) with office accommodation (Use Class E), HGV and car parking, works to watercourse including realignment and associated infrastructure works.

The above reference to there being '*a number of planning applications in the process of preparation'* is incorrect. In 2022, four applications for industrial development (Use Classes B2 and B8) were granted outline planning permission (under references R/2020/0820/ESM, R/2020/0819/ESM, R/2020/0821/ESM and R/2020/0822/ESM) for over 880,000sqm of floorspace across areas of Teesworks, including land that is identified as 'Main Site A' for the H2Teesside Project (an area that Teesworks refers to as 'The Foundry"). In total, over 1.3million sqm of floorspace for Class B2 or B8 uses across the Teesworks estate has been granted outline planning permission.

It would appear that the '*recently submitted*' applications referred to above are likely to be those for the remediation of land to facilitate the development of the Net Zero Teesside project (reference R/2021/1048/FFM) and the Prior Approval of demolition works of the former Redcar Steelworks buildings (reference R/2021/0608/PND). Both applications were, however, approved in August 2022 and August 2021 respectively.

Figure 15 identifies the location of each of the STDC Projects within and adjacent to the Proposed Development Site. We can confirm that the projects identified in respect of Teesworks land are correct at the time of writing, though the commentary in respect of these applications / permissions is not. We do, therefore, wish to engage further with H2Teesside Ltd on this matter to ensure that the full list of cumulative schemes is kept up to date, that the scope of any cumulative assessment is appropriate, and to ensure that the development proposed on Teesworks is assessed accurately within any subsequent Environmental Assessment.

5 We have undertaken a high-level review of the methodologies for each of the technical assessments provided within section 6 of the EIA Scoping Report and have no specific comments to make except in respect of 'Cumulative and Combined Effects' which are set out above.

We acknowledge that the H2Teesside project is in the early stages of development and that the detail provided in the EIA Scoping Report requires further refinement and clarity prior to consultation on the Preliminary Environmental Impact (PEI) Report which is expected in summer 2023. It is crucial that Teesworks participates in discussions with the applicant and its advisors, regarding the refinement of the red line boundary and the extent of land required for constructing and operating the H2Teesside project, particularly its pipeline routes and infrastructure corridors. As with the Net Zero Teesside scheme / DCO, it is imperative that H2Teesside Ltd reduces the red line boundary to cover only the areas of land which are absolutely necessary for the delivery of the project.

We, therefore, consider it necessary for H2Teesside Ltd to hold urgent targeted consultation with Teesworks over land availability, interaction with the wider Teesworks site plans and commercial arrangements and to allow an appropriate period for responding prior to the submission of the draft DCO documentation to PINS.

It is expected that the finalisation of the pipeline routes / infrastructure corridors and corresponding reduction in the red line boundary will give sufficient clarity to enable Teesworks to fully understand and assess the impacts of the development and to be satisfied that there would be no unacceptable implications on the overall comprehensive regeneration of the Teesworks area.

Many thanks again for consulting Teesworks at this stage and we look forward to working with you to resolve our concerns.

Yours sincerely

Anthony Greally
Senior Director

Woodger-Bassford, Jade

From: ONR Land Use Planning <ONR-Land.Use-Planning@onr.gov.uk>
Sent: 04 May 2023 13:09
To: H2Teesside
Subject: ONR Land Use Planning - Application EN070009
Attachments: image009.png; image008.png; H2TE - Statutory consultation letter.pdf; image002.png; image001.png; image010.png; image011.png

Dear Sir / Madam,

ONR have no objection to the proposed development at this stage subject to the developer liaising with EDF Energy Nuclear Generation Limited in relation to the potential external hazards the proposed development poses to Hartlepool and vice versa. Depending on future siting and layout decisions, the proposed development could pose an external hazard to Hartlepool during construction, operation and potentially decommissioning.

Further information on ONR's role in providing advice on proposed developments on and around nuclear sites is available on ONR's website: https://www.onr.org.uk/land-use-planning.htm. The developer should familiarise itself with this information including ONR's consultation zones, consultation advice and the consultation process.

Kind regards

Vicki Enston
Land Use Planning
Office for Nuclear Regulation
ONR-Land.Use-planning@onr.gov.uk

----Original Message----
From: H2Teesside <H2Teesside@planninginspectorate.gov.uk >
To: H2Teesside@planninginspectorate.gov.uk;
Cc:
Sent: 12/04/2023 13:56
Subject: EN070009 - H2Teesside - EIA Scoping Notification and Consultation

Dear Sir/ Madam

Please see attached correspondence on the proposed H2Teesside project.

Please note that the deadline for consultation responses is **9 May 2023**, and is a statutory requirement that cannot be extended.

Kind regards

Laura

Laura Feekins-Bate

EIA Advisor

The Planning Inspectorate

@PINSgov The Planning Inspectorate planninginspectorate.gov.uk

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DPC:76616c646f72

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Feekins-Bate, Laura

From: H2Teesside
Subject: FW: EN070009 - H2Teesside - EIA Scoping Notification and Consultation

---

From: Stephen Vanstone [redacted]@trinityhouse.co.uk>
Sent: 09 May 2023 09:30
To: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Cc: Trevor Harris [redacted]@trinityhouse.co.uk>
Subject: RE: EN070009 - H2Teesside - EIA Scoping Notification and Consultation

Good morning Laura,

I note that the proposed development area includes areas within the River Tees which lie within the jurisdiction of PD Teesport Ltd.. Therefore, Trinity House advise that any marine works proposed below mean high water springs should be fully assessed in consultation with PD Teesport Ltd.

Kind regards,

Stephen Vanstone
Navigation Services Manager | Navigation Directorate | Trinity House
[redacted]@trinityhouse.co.uk | [redacted]
www.trinityhouse.co.uk

TRINITY HOUSE

From: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Sent: 11 April 2023 10:36
To: Navigation <navigation@trinityhouse.co.uk>
Cc: H2Teesside <H2Teesside@planninginspectorate.gov.uk>; Thomas Arculus [redacted]@trinityhouse.co.uk>
Subject: EN070009 - H2Teesside - EIA Scoping Notification and Consultation

FAO Steve Vanstone- Navigation Services Officer

Dear Mr Vanstone

Please see attached correspondence on the proposed H2Teesside project.

Please note that the deadline for consultation responses is **9 May 2023**, and is a statutory requirement that cannot be extended.

Kind regards
Laura

Laura Feekins-Bate
EIA Advisor
The Planning Inspectorate

Our policy covering our approach to Data Protection complies with UK law, including the Data Protection Act 2018 (incorporating the General Data Protection Regulation), and associated legislation, and can be accessed via our Privacy Notice and Legal Notice listed on our website (www.trinityhouse.co.uk)

https://www.trinityhouse.co.uk/legal-notices

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UK Health Security Agency

Environmental Hazards and Emergencies Department
Seaton House, City Link
London Road
Nottingham, NG2 4LA

nsipconsultations@ukhsa.gov.uk
www.gov.uk/ukhsa

Your Ref: EN070009
Our Ref: 63300CIRIS

Ms Laura Feekins-Bate,
EIA Advisor,
The Planning Inspectorate
Temple Quay House,
2 The Square,
Bristol, BS1 6PN

5th May 2023

Dear Ms Feekins-Bate,

Nationally Significant Infrastructure Project
H2Teeside Project EN070009
Scoping Consultation Stage

Thank you for including the UK Health Security Agency (UKHSA) in the scoping consultation phase of the above application. ***Please note that we request views from the Office for Health Improvement and Disparities (OHID) and the response provided below is sent on behalf of both UKHSA and OHID.*** The response is impartial and independent.

The health of an individual or a population is the result of a complex interaction of a wide range of different determinants of health, from an individual's genetic make-up to lifestyles and behaviours, and the communities, local economy, built and natural environments to global ecosystem trends. All developments will have some effect on the determinants of health, which in turn will influence the health and wellbeing of the general population, vulnerable groups and individual people. Although assessing impacts on health beyond direct effects from for example emissions to air or road traffic incidents is complex, there is a need to ensure a proportionate assessment focused on an application's significant effects.

Having considered the submitted scoping report we wish to make the following specific comments and recommendations:

Environmental Public Health

We recognise the promoter's proposal to include a health section. We believe the summation of relevant issues into a specific section of the report provides a focus which ensures that public health is given adequate consideration. The section should summarise key information, risk assessments, proposed mitigation measures, conclusions, and residual impacts, relating to human health. Compliance with the requirements of National Policy Statements and relevant guidance and standards should also be highlighted.

In terms of the level of detail to be included in an Environmental Statement (ES), we recognise that the differing nature of projects is such that their impacts will vary. UKHSA and OHID's predecessor organisation Public Health England produced an advice document *Advice on the content of Environmental Statements accompanying an application under the NSIP Regime*', setting out aspects to be addressed within the Environmental Statement[1]. This advice document and its recommendations are still valid and should be considered when preparing an ES. Please note that where impacts relating to health and/or further assessments are scoped out, promoters should fully explain and justify this within the submitted documentation.

Recommendation

Our position is that pollutants associated with road traffic or combustion, particularly particulate matter, and oxides of nitrogen, are non-threshold; i.e. an exposed population is likely to be subject to potential harm at any level and that reducing public exposure to non-threshold pollutants (such as particulate matter and nitrogen dioxide) below air quality standards will have potential public health benefits. We support approaches which minimise or mitigate public exposure to non-threshold air pollutants, address inequalities (in exposure) and maximise co-benefits (such as physical exercise). We encourage their consideration during development design, environmental and health impact assessment, and development consent.

Human Health and Wellbeing - OHID

This section of OHIDs response, identifies the wider determinants of health and wellbeing we expect the ES to address, to demonstrate whether they are likely to give rise to significant effects. OHID has focused its approach on scoping determinants of health and wellbeing under four themes, which have been derived from an analysis of the wider determinants of health mentioned in the National Policy Statements. The four themes are:

- Access
- Traffic and Transport

[1] https://khub.net/documents/135939561/390856715/Advice+on+the+content+of+environmental+statements+accompanying+an+application+under+the+Nationally+Significant+Infrastructure+Planning+Regime.pdf/a86b5521-46cc-98e4-4cad-f81a6c58f2e2?t=1615998516658

- Socioeconomic
- Land Use

Having considered the submitted Scoping Report, OHID wish to make the following specific comments and recommendations.

Hydrogen gas manufacture, storage and distribution network – Community risk perception / understanding of risk.

The broad definition of health used by the World Health Organisation (WHO), includes reference to mental health. Mental well-being is fundamental to achieving a healthy, resilient and thriving population. It underpins healthy lifestyles, physical health, educational attainment, employment and productivity, relationships, community safety and cohesion and quality of life. A scheme of this scale and nature has impacts on the over-arching protective factors, which are:

• Enhancing control
• Increasing resilience and community assets
• Facilitating participation and promoting inclusion.

The scoping report does not make reference to the potential for local public concern through understanding of risk / risk perception. Previous hydrogen distribution schemes have scoped-in community concern over hydrogen safety, due to this being a relatively new industry and the potential for major incidents.

Communities in the vicinity of the scheme will receive targeted communications as part of the normal consultation process. Communication programmes should provide a source of clear and objective information to increase knowledge and awareness. Consultations should also use the opportunity to assess levels of local concern, which can then be used to assess significance of effects and inform community consultation and the provision of information.

Recommendation

The ES should consider potential effects on mental health through risk perception / understanding of risk posed by the manufacture, storage and transportation of hydrogen and other hazardous substances.

When estimating community anxiety and stress in particular, a qualitative assessment may be most appropriate. Robust and meaningful consultation with the local community will be an important mitigation measure, in addition to informing the assessment and subsequent mitigation measures. This may involve conducting resident surveys but also information received through public consultations, including community engagement exercises. The Mental Well-being Impact Assessment Toolkit (MWIA) contains key principles that should be demonstrated in a project's community engagement and impact assessment. We would also

encourage consultation with the local authority's public health team, who are likely to have Health Intelligence specialists who will have knowledge about the availability of local data. The Mental Well-being Impact Assessment Toolkit (MWIA)[2], could be used as a methodology. The assessment should identify vulnerable populations and provide clear mitigation strategies that are adequately linked to any local services or assets. Baseline indicators the assessment would benefit from including social cohesion/connectedness, satisfaction with local area and quality of life indicators owing to their established links to mental health and wellbeing.

In terms of sources, we would draw your attention to the following:

- PHE Fingertips – Mental Health and Wellbeing JSNA
    - Area profiles with various indicators on common mental disorders (including anxiety) and severe mental illness which can be benchmarked with other local areas as well as regional and national data
- Office for National Statistics - Wellbeing Indicators
    - Range of datasets related to wellbeing available including young people's wellbeing measures, personal wellbeing estimates and loneliness rates by local authority

Socio-economics - Housing affordability and availability

The report (Para 3.14.1) recognised the potential for significant numbers of construction workers, where workforce peak numbers will be approximately 3,100 people per day. The numbers of non-home-based workers was not stated.

The report does not recognise a requirement for temporary living accommodation within reasonable commuting distance of the project such as rented housing, hotels, guest houses, bed and breakfast establishments/lodgings and official caravan parks.

Significant number of non-home-based construction workers could foreseeably have an impact on the local availability of affordable housing. Those residents looking for low cost affordable homes will have the least capacity to respond to change (for example, where there may be an overlap between construction workers seeking accommodation in the private rented sector, and people in receipt of housing benefit seeking the same lower-cost accommodation). This impact could also be compounded by the cumulative accommodation demands from a number of large developments.

[2] Mental Wellbeing Impact Assessment Toolkit, (National MWIA Collaborative (England), 2011) - A toolkit with an evidence-based framework for improving well-being through projects.

Recommendation

The peak numbers of construction workers and non-home-based workers should be established, and a proportionate assessment undertaken on the impacts for housing availability or affordability and impacts on any local services.

Any cumulative effect assessment should consider the impact on demand for housing by construction workers and the likely numbers of non-home based workers required across all schemes.

Yours sincerely

On behalf of UK Health Security Agency
nsipconsultations@ukhsa.gov.uk

Please mark any correspondence for the attention of National Infrastructure Planning Administration.