

Teesside Cluster Carbon Capture & Usage Project

Application for a Scoping Opinion

The Infrastructure Planning (Environmental Impact
Assessment) Regulations 2017 – Regulation 10
(‘Application for a scoping opinion’)

OGCI Climate Investments Holdings LLP

Project number: 60559231

February 2019

Quality information

Prepared by

Ross Taylor
Principal Environmental
Consultant

Checked by

Simon Wild
Technical Director

Approved by

Richard Lowe
Director, Power and Industrial
Consents

Revision History

Revision	Revision date	Details	Authorized	Name	Position
Rev 0	14/02/2018	For Issue		R Lowe	Director

Prepared for:

OGCI Climate Investments Holdings LLP
Translation & Innovation Hub
Central Working
80 Wood Lane
White City, London W12 0BZ

Prepared by:

AECOM Infrastructure & Environment UK Limited
5th Floor, 2 City Walk
Leeds LS11 9AR
United Kingdom

T: +44 (0)113 391 6800
aecom.com

© 2019 AECOM Infrastructure & Environment UK Limited. All Rights Reserved.

This document has been prepared by AECOM Infrastructure & Environment UK Limited ("AECOM") for sole use of our client (the "Client") in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between AECOM and the Client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECOM.

Table of Contents

1.	Introduction	7
	Background	7
	Consenting Regime	8
	Request for a Scoping Opinion	10
	<i>Purpose of Scoping</i>	11
	<i>Requirements for Requesting a Scoping Opinion</i>	11
	Structure of Remainder of this Report	13
2.	Description of the Existing Environment	15
	The Proposed Development	15
	SSI Site	16
	<i>History</i>	17
	Planning Designation Constraints	17
	The Main Site	17
	Gas Connection Corridors	20
	Electrical Connection Corridors	21
	Water Connection Corridors	22
	Onshore CO ₂ Transport Pipeline Corridor	23
	CO ₂ Gathering Network Corridors	24
3.	Proposed Development	25
	The Proposed Development	25
	<i>Generating Station</i>	25
	<i>Capture Plant</i>	27
	<i>Fuel</i>	28
	<i>Electrical Connection</i>	28
	<i>Water Connections</i>	29
	<i>CO₂ Transport</i>	30
	<i>Material Storage on Site</i>	31
4.	Consideration of Alternatives	32
	Introduction	32
	Site Selection	32
	<i>Overview</i>	32
5.	Planning Policy	34
	Clean Growth Strategy	34
	National Planning Policy	35
	<i>Planning Act 2008</i>	35
	<i>National Policy Statements</i>	35
	<i>National Planning Policy Framework</i>	36
	<i>Planning Practice Guidance</i>	37
	Local Planning Policy	37
	<i>Redcar & Cleveland Local Plan</i>	38
	<i>South Tees SPD</i>	38
	<i>Stockton-on-Tees Local Plan</i>	38
	Other Documents Considered	38
	<i>South Tees Regeneration Master Plan</i>	38
	<i>Tees Valley Combined Authority (TVCA)</i>	38

6.	Potentially Significant Environmental Issues	40
	Air Quality and Climate	40
	<i>Baseline Conditions</i>	40
	<i>Scope of the Assessment</i>	41
	<i>Climate Change</i>	43
	Hydrology & Water Resources	43
	<i>Baseline Conditions</i>	43
	<i>Scope of the Assessment</i>	44
	Geology & Hydrogeology	45
	<i>Baseline Conditions</i>	45
	<i>Scope of the Assessment</i>	46
	Noise & Vibration	47
	<i>Baseline Conditions</i>	47
	<i>Scope of the Assessment</i>	47
	Ecology & Nature Conservation	49
	<i>Baseline Conditions</i>	49
	<i>Ecological Surveys and Data Collection</i>	50
	<i>Ecological Impact Assessment Methodology</i>	52
	<i>Habitats Regulations Assessment</i>	53
	<i>Scope of the Assessment</i>	53
	Traffic & Transportation	54
	<i>Baseline Conditions</i>	54
	<i>Scope of the Assessment</i>	54
	Landscape & Visual Amenity	56
	<i>Baseline Conditions</i>	56
	<i>Scope of the Assessment</i>	56
	Archaeology & Cultural heritage	58
	<i>Baseline Conditions</i>	58
	<i>Scope of the Assessment</i>	58
	Socio-economics & Tourism	60
	<i>Baseline Conditions</i>	60
	<i>Scope of the Assessment</i>	60
	Population and Human Health	61
	Cumulative Effects	62
	<i>Other Developments</i>	62
7.	Environmental Impact Assessment	63
	EIA Methodology and Reporting	63
	<i>Structure of the Environmental Statement</i>	63
	<i>Structure of Technical Chapters</i>	64
	Scoping and Consultation	67
8.	Summary	69
	Items Proposed for Scoping Out of EIA	69
	<i>Major Accidents or Disaster Vulnerability</i>	69
	Appendix A – Figures	72

Tables

Table 1.1: Information Required for a Request for a Scoping Opinion	12
Table 1.2: Information to be provided in the Scoping Report	13
Table 6.1: Background Air Quality Data	41

1. Introduction

Background

- 1.1 Climate Investments, as part of the Oil and Gas Climate Initiative (OGCI) (hereafter referred to as “the Applicant”) has appointed AECOM Infrastructure and Environment UK Ltd (AECOM) to prepare this Environmental Impact Assessment (EIA) Scoping Report to support an application for a scoping opinion under Regulation 10 ‘Application for scoping opinion’ of ‘The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017’ for a proposed full chain Carbon Capture Usage and Storage (CCUS) project to be located in Redcar, South Teesside; see Figure 1 (Appendix A).
- 1.2 The project, the Teesside Cluster Carbon Capture and Usage Project, comprises the development of a Combined Cycle Gas Turbine (CCGT) gas-fired generating station and gas, electricity and cooling water connections, with post-combustion carbon capture and compression plant, together with a gathering station for carbon dioxide (CO₂) from the generating station and other industrial sources, low-pressure CO₂ pipeline connections to potential industrial sources, and a high pressure CO₂ pipeline for the onward transport CO₂ to an offshore geological storage site in the North Sea (referred to herein as “the Proposed Development”).
- 1.3 The Proposed Development is subject to on-going technical studies, but the generating station is expected to comprise up to three CCGT trains achieving an electrical output capacity of up to 2,100 megawatts (MW) onto the national transmission network.
- 1.4 The generating station that will form part of the Proposed Development will also require connections to the National Grid Gas (NGG) high pressure transmission network, the National Grid national electricity transmission system (NETS), connections for the supply and discharge of water as well as water supply and discharge pipelines and other supporting infrastructure.
- 1.5 It is proposed that the CO₂ gathering station will receive CO₂ from both the generating station and, in the future, a number of industrial sources on Teesside in order as a full CCUS project. The Proposed Development will therefore include the necessary infrastructure to allow for future industrial connections. From the gathering station, the CO₂ will be transported via the high-pressure CO₂ pipeline to a suitable offshore geological storage site (e.g. a depleted hydrocarbon field) in the North Sea. The selection of a storage site is yet to be made.
- 1.6 The generating station, together with the associated CO₂-capture equipment and compression equipment, which will form part of the Proposed Development (“the Main Site”) is to be located on the former Sahaviriya Steel Industries UK Limited (SSI) steel works site on the southern bank of the River Tees estuary. The proposed CO₂ transport pipeline will extend from the north of the Main Site to a geological storage site beneath the North Sea.
- 1.7 Figures identifying the locations of each element of the Proposed Development are provided in Appendix A. The Main Site is shown in Figure 1.

- 1.8 This EIA Scoping Report covers the on-shore works associated with the Proposed Development (i.e. those works that take place up to the Mean Low Water Springs); off-shore works, including the sub-sea CO₂ pipeline and storage site, will be subject to the offshore consents regime and, as such, will be assessed under a separate EIA. The interrelation of the onshore and offshore works is discussed further in this Report.

Consenting Regime

- 1.9 Part 3, Section 14 of the PA2008 defines the types of development that constitute a NSIP and require development consent under Section 31. In the ‘field’ of energy these include generating stations, electric lines, underground gas storage facilities, LNG facilities, gas reception facilities, gas transporter pipelines and other forms of pipeline.
- 1.10 The generating station element of the Proposed Development constitutes a NSIP under Section 15(2) of the PA2008, as it is an onshore electricity generating station in England with a capacity of more than 50 MW. The electrical connection to the NETS also represents a NSIP under Section 16 (1) and (2) as it may be an overhead electrical line in England with a nominal voltage of 132 kilovolts (kV) or more and a length of over 2 kilometres (km). The other elements of the Proposed Development do not represent NSIPs in their own right.
- 1.11 Section 115 of the PA2008 confirms that development consent may be granted for development, which is development (i.e. an NSIP) for which development consent is required, or ‘associated development’. The Department for Communities and Local Government (DCLG) has produced guidance on associated development (*‘Guidance on associated development application for major infrastructure projects’, April 2013*). Paragraph 5 sets out a number of core principles that the Secretary of State should take into account in deciding whether or not development is associated development:
- “(i) ... associated development ... requires a direct relationship between associated development and the principal development. Associated development should therefore either support the construction or operation of the principal development, or help address its impacts.*
- (ii) Associated development should not be an aim in itself but should be subordinate to the principal development.*
- (iii) Development should not be treated as associated development if it is only necessary as a source of additional revenue for the applicant, in order to cross-subsidise the cost of the principal development. This does not mean that the applicant cannot cross-subsidise, but if part of a proposal is only necessary as a means of cross-subsidising the principal development then that part should not be treated as associated development.*

(iv) Associated development should be proportionate to the nature and scale of the principal development. However, this core principle should not be read as excluding associated infrastructure development (such as a network connection) that is on a larger scale than is necessary to serve the principal development if that associated infrastructure provides capacity that is likely to be required for another proposed major infrastructure project. When deciding whether it is appropriate for infrastructure which is on a larger scale than is necessary to serve a project to be treated as associated development, each application will have to be assessed on its own merits. For example, the Secretary of State will have regard to all relevant matters including whether a future application is proposed to be made by the same or related developer as the current application, the degree of physical proximity of the proposed application to the current application, and the time period in which a future application is proposed to be submitted.”

- 1.12 Paragraph 6 of the DCLG guidance goes on to state that it is expected that associated development will, in most cases, be typical of development brought forward alongside the relevant type of principal development or of a kind that is usually necessary to support a particular type of project, for example (where consistent with the core principles above), a grid connection for a commercial generating station.
- 1.13 The Proposed Development encompasses all the onshore works for what would be the UK's first, commercial scale, full chain CCUS project. For the purposes of the PA2008, the generating station element of the Proposed Development (a NSIP in its own right), is considered to represent the 'principal development'. The generating station is integral to the delivery of the CCUS project. While the CO₂ gathering network and transport pipeline would be available to industrial emitters of CO₂, the generating station would be constructed at the same time and, in effect, be the 'anchor' for the overall CCUS project. Without the generating station element, the CCUS project is not commercially viable (as there would be no committed supply of carbon dioxide) and the benefits of CCUS could not demonstrated at a commercial scale.
- 1.14 In terms of what elements of the Proposed Development represent associated development for the purposes of the PA 2008, it is considered that the cooling water, gas and electricity connections are all associated development. Each of these elements clearly has a direct relationship with the principal development (the generating station) being required to support its operation. Furthermore, they are clearly subordinate to the principal development and are listed at Annex B to the DCLG guidance as examples of the types of associated development specific to onshore electricity generating stations.
- 1.15 It is also considered that the post-combustion CO₂ capture and compression plant, the CO₂ gathering station, the CO₂ gathering network and the main CO₂ transport pipeline are associated development. Each of these elements (with the exception of the CO₂ gathering network) has a direct relationship with the principal development, that is, to capture and compress the CO₂ created from the combustion of natural gas within the CCGT units; to receive this at the gathering station; and then transport it via the high-pressure pipeline to the offshore storage site. Without this infrastructure, the power station would be a standalone development rather than the anchor for a full chain CCUS project. Furthermore, this infrastructure would help address the impacts of the generating station, through the capture, transport and storage of CO₂. The DCLG guidance recognises that associated development can be development that helps address the impacts of the principal development.

- 1.16 While the CO₂ gathering network is not directly related to the principal development (the power station), it is an integral element of the overall CCUS project, as it will facilitate the future connection of industrial sources of CO₂, support the operation of the project and underpin its future commercial viability. Indeed, the gathering station and CO₂ transport pipeline have been designed so as to be able accommodate carbon dioxide emissions from a number of sources (not just the power station) and the gathering network represents an extension of that ‘oversizing’. The DCLG guidance recognises that associated development can be provided on a larger scale than is necessary to serve the principal development if that infrastructure provides capacity for other projects in the future, as would be the case here. It is therefore considered that the CO₂ gathering network also represents associated development.
- 1.17 Development consent for a NSIP may only be granted through a development consent order (DCO) made following an application, under Section 37 of the PA2008, to the relevant Secretary of State, which for the Proposed Development is the Secretary of State for Business, Energy and Industrial Strategy (BEIS). The Planning Inspectorate (PINS) is the agency responsible for administering the planning process for NSIPs. PINS examines all applications for development consent and makes a recommendation to the relevant Secretary of State, who then makes the decision on whether to grant or refuse development consent.
- 1.18 Section 37 of the PA2008 also governs the form, content and accompanying documents that are required as part of a DCO application. The requirements are implemented through the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) (APFP Regulations). The APFP Regulations state that an application must be accompanied by an Environmental Statement (ES), where a development is considered to be ‘EIA development’ under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations).
- 1.19 Regulation 3(1) of the EIA Regulations defines the meaning of ‘EIA development’ (with reference to Schedules 1 and 2 to the EIA Regulations). Schedule 1 to the EIA Regulations, which describes developments for which an environmental impact assessment (EIA) is necessary, includes “*thermal power stations, and other combustion installations, with a heat output of 300 megawatts or more.*” Also included in Schedule 1 are “*Installations for the capture of carbon dioxide streams for the purposes of geological storage pursuant to Directive 2009/31/EC from installations ... where the total yearly capture of carbon dioxide is 1.5 megatonnes or more.*” EIA is compulsory for Schedule 1 developments given the type and/ or the scale of the development is likely to have the potential for significant effects on the environment.
- 1.20 Given its capacity and the nature of the proposed activities, the Proposed Development will therefore be ‘EIA development’ and consequently a formal EIA screening opinion is not being sought from the Secretary of State.
- 1.21 In accordance with Regulation 8(1)(b) of the EIA Regulations, the Applicant notifies the Secretary of State that it will provide an ES as part of the application for development consent for the Proposed Development.

Request for a Scoping Opinion

- 1.22 Having determined that an ES will be included as part of the application for development consent, that 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 Secretary of State for their opinion as to the scope and level of detail of the information to be provided in the ES.

Purpose of Scoping

- 1.23 The scoping phase of the EIA process provides a framework for identifying likely significant environmental impacts arising from a development and distinguishing the priority issues to be addressed at the assessment stage. This framework assists in focusing the attention (of developers, consultees and decision makers) on key environmental impacts for inclusion and consideration within the EIA. The scoping phase also identifies those matters which do not need to be assessed in detail.
- 1.24 This Scoping Report has been prepared to facilitate early pre-application engagement with key statutory consultees and stakeholders on the Proposed Development together with the proposed structure, methodology and content of the EIA.

Requirements for Requesting a Scoping Opinion

- 1.25 This Scoping Report has been prepared in accordance with the relevant legislative provisions and associated Advice Notes (published by PINS).
- 1.26 Table 1.1 presents a list of information that should be included in a request for a 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. The Table also includes the location in which that information is provided within this Scoping Report.
- 1.27 The information to be included within the Scoping Report is the same as the information required for an EIA screening request (noting that, as per Paragraph 1.10, such a request is not required for the Proposed Development). The information required for a screening request is prescribed in Regulation 8(3) therefore, where Regulation 8(3) provides further detail to Regulation 10(3), this has been included as supplementary information in Table 1.1.

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 presented
A plan sufficient to identify the land	-	Figure 1 (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 3 Section 2 and Section 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
Such other information or representations as the person making the request may wish to provide or make	-	See Table 1.2

Source: Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements, PINS, December 2017

1.28 In Advice Note Seven, PINS recommends that the above 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 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 4
Referenced plans presented at an appropriate scale to convey clearly the information and all known aspects associated with the Proposed Development	Figures (Appendix A)
An outline of the reasonable alternatives considered and the reasons for selecting a preferred option	Section 4
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
A detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided	Section 8
Results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters	N/A
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
Any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects	TBC
References to any guidance and best practice to be relied upon	Section 6
Evidence of agreements reached with consultation bodies (for example the statutory nature conservation bodies or local authorities)	N/A
An outline of the structure of the proposed ES	Section 7

Source: Advice Note Seven: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping, PINS, March 2015

Structure of Remainder of this Report

1.29 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 site;
- Section 3 – The 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: 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);

- Section 7 – Environmental Impact Assessment: provides an outline structure for the proposed ES;
- Section 8 – Summary.

2. Description of the Existing Environment

The Proposed Development

- 2.1 The Main Site of the Proposed Development will be located within the SSI site, comprising part of the SSI former landholding to the east of the Redcar Bulk Terminal, on the south bank of the River Tees. The Main Site, together with the connection corridors for the electrical grid connection, water abstraction and discharge and the onshore element of the Co₂ transport pipeline, will be located within the administrative boundary of the Redcar and Cleveland Borough Council (RCBC), in the ward of Dormanstown. Connections to the NGG and a CO₂ gathering network are intended to cross the River Tees to land within the administrative boundary of the Stockton on Tees Borough Council (STBC).
- 2.2 Figure 1 (Appendix A) illustrates the current extent of land considered for the Proposed Development (the 'DCO Application Boundary').
- 2.3 At this stage, the connection routes are shown as indicative corridors; these will be subject to appraisal and refinement as the preparation of the DCO application progresses. The final connection routes/ corridors that will be incorporated within the proposed order limits will be determined through on-going studies of potential constraints and discussions with National Grid and existing emitters of CO₂ that may wish to utilise the CO₂ gathering network.
- 2.4 For the purposes of this report, the Proposed Development site is split into distinct areas (see Figures 1 to 4, Appendix A):
- The land within the indicative site boundary (the 'Main Site' – Figure 1):
 - The Main Site would encompass the proposed generation station (CCGT units), CO₂ capture equipment, cooling, transformers and auxiliary equipment together with providing sufficient land for use (as laydown) during the construction of this part of the Proposed Development;
 - 'Gas Connection Corridors' – Figure 2:
 - The areas currently under consideration for the construction of the gas supply pipeline and associated infrastructure;
 - 'Electrical Connection Corridors' – Figure 3:
 - The areas currently under consideration for the construction of the connection to the NETS;
 - 'Water Connection Corridors' – Figure 4:
 - The areas currently under consideration for the construction of pipelines for the abstraction and discharge of water;
 - 'Onshore CO₂ Transport Corridor' – Figure 4:
 - The area currently under consideration for the construction of the on-shore portion of the CO₂ export pipeline; and

- 'CO₂ Gathering Network Corridors' – Figure 4:
 - The area currently under consideration for the construction of a pipe network that could be used by existing CO₂ emitters to export CO₂ captured from their processes¹ to the Main Site for onward transport to a depleted hydrocarbon field for geological storage beneath the North Sea, building on work undertaken by the Teesside Collective (see Section 5).
- 2.5 The indicative boundary for the Main Site currently encompasses an area of approximately 52 hectares (ha) within the SSI site. The final proposed boundary for the DCO application (that will also include land for the connection corridors and temporary land required during construction of the Proposed Development) will be determined through on-going studies and consultation with key stakeholders with due regard to the South Tees Regeneration Master Plan (draft, October 2017). Any existing structures currently within the proposed Main Site are expected to be demolished and cleared prior to development; any such demolition works do not form part of the Proposed Development or DCO application.
- 2.6 Similarly, the connections to the high-pressure gas network, the NETS (and the on-shore element of the CO₂ transport pipeline) are the subject of on-going consultations and studies.
- 2.7 The Main Site, Electrical and Water Connection Corridors and the Onshore CO₂ Transport Pipeline Corridor are all located entirely within the administrative area of Redcar & Cleveland Borough Council (RCBC), in addition to the part of the Gas Connection Corridor and CO₂ Gathering Network Corridors that are located to the south of the River Tees. Where the Gas Connection Corridor and CO₂ Gathering Network Corridors are north of the River Tees, this land is within the jurisdiction of STBC.

SSI Site

- 2.8 The SSI site comprises approximately 225 ha of land previously used for iron and coke manufacture, together with associated ancillary development.
- 2.9 The land within the boundary of the SSI site comprises generally large scale plant and buildings (such as the raw materials handling facility, the sinter plant and extensive conveyor systems), with large open land areas that were previously utilised for raw materials storage and processing. The northern portion of the SSI site includes former coke ovens and blast furnace.
- 2.10 The SSI site is located within the administrative boundary of the RCBC, in the ward of Dormanstown. Located to the north of Teesside's major industrial area, the SSI site is remote from large residential receptors, although it is noted that there are areas of public/ private amenity close to its boundary.
- 2.11 The nearest residential settlements are the town of Redcar (approximately 1.6 km east), including the borough of Dormanstown (approximately 1.1 km to the southeast).

¹ The development of carbon capture equipment for third party sites would be the responsibility of the operators of those sites and, as such, is not included as part of the Proposed Development.

History

- 2.12 Prior to the construction of the iron making facilities in the 1970s, this part of the SSI site principally comprised reclaimed marshland, apart from the eastern corner of the site which was occupied by the historic Warrenby iron and steel works, until the 1960s.
- 2.13 In October 2015, SSI went into liquidation, marking the end of almost 170 years of iron and steel making on Teesside. As a result, the SSI site was amongst a number of local sites closed, resulting in a significant negative impact on the local economy.
- 2.14 In February 2016, the UK Government announced plans for the establishment of a new Mayoral Development Corporation (MDC) within the Tees Valley Combined Authority (TVCA). The TVCA was created in April 2016 as a partnership of five local authorities, including RCBC, to work closely with businesses and other partners to provide support to the local economy using devolved powers relating to: infrastructure, skills, business investment, housing, culture and tourism. The purpose of the MDC is to enable greater powers for the development area to be devolved, in areas including regeneration planning and business support.
- 2.15 The South Tees Development Corporation (Establishment) Order 2017 came into force in August 2017 and created the South Tees Development Corporation (STDC). The STDC has been set up to promote economic growth and commercial development in the Tees Valley. The STDC area covers approximately 4,500 acres of land to the south of the River Tees, within RCBC. It includes the former SSI steelworks site as well as other industrial assets.

Planning Designation Constraints

- 2.16 There are no planning designations on the SSI site that would represent a barrier to the construction and operation of the Proposed Development or that would preclude any areas within the SSI site from the selection of the final site location within it.
- 2.17 Further detail regarding the planning policies applicable to the site and/ or the Proposed Development is provided in Section 5.

The Main Site

- 2.18 To the northwest of the Main Site, there is large industrial plant and equipment from the, now closed, iron-making plant formerly owned by SSI. The operational Redcar Bulk Terminal is located immediately northwest of the SSI site, on the south bank of the River Tees.
- 2.19 To the northeast of the Main Site lie the coastal areas of South Gare and Cotham Sands that are local environmental and community assets and part of the Teesmouth and Cleveland Coast Special Protection Area (SPA) and the Teesmouth and Cleveland proposed SPA (pSPA). To the south lie the Northumbrian Water Bran Sands sewage treatment plant, operational land of PD Ports Teesport and the Wilton International industrial complex.
- 2.20 On the north bank of the River Tees, and west of the SSI site, similar industrial complexes are present (at Seal Sands).
- 2.21 The major industrial nature of the area is reflected in local planning policy, as discussed in Section 5.

2.22 A number of environmental receptors have been identified within the vicinity of the Main Site, each of these are detailed below under each environmental discipline (note this may not be an exhaustive list at this stage). All distances are given as the shortest distance between the receptor and the closest point of the Main Site boundary (see Figure 1, Appendix A).

- Residential:
 - The towns of:
 - Dormanstown (approximately 1.1 km southeast); and
 - Redcar (approximately 1.6 km east).
- Traffic and Transport:
 - The main route to the site will be via existing access roads from the A1085 trunk road between Redcar and the A1053 Tees Dock Road, north of Grangetown and approximately 4 km south of the SSI site. From here, the A19 will be accessed from either the A66, passing north of Middlesbrough, or the A174, passing to the south;
 - Rail lines to/from the Redcar Bulk Terminal run approximately east/west in the southern portion of the Main Site;
 - There are no PRoWs crossing or adjacent to the SSI site therefore development of the generating station and capture plant (and other on-site infrastructure) will have no impact on PRoWs.
- Ecology:
 - The Teesmouth and Cleveland Coast SPA/ Ramsar site is located approximately 240 m north of the SSI site (at its nearest point). The site includes a range of coastal habitats (sand- and mud-flats, rocky shore, saltmarsh, freshwater marsh and sand dunes) on and around the Tees Estuary. Natural England is currently consulting on an extension to the SPA designation to include additional areas of the estuary and nearshore waters for feeding tern species; this is referred to as the 'potential' or pSPA. This pSPA extension is considered to have the same level of designation as the current SPA/ Ramsar in the planning process, and therefore the entire Teesmouth and Cleveland Coast SPA/ pSPA/ Ramsar will be considered as a single entity.
 - A further three European sites are located within 15 km of the Main Site:
 - Northumbria Coast SPA/ Ramsar site (approximately 14.6 km north west);
 - Durham Coast Special Area of Conservation (SAC) (14.6 km north west); and
 - North York Moors SAC/ SPA/ National Park (11.5 km south east).
 - There are five sites of special scientific interest (SSSI) located within 5 km of the Main Site:
 - the South Gare and Coatham Sands SSSI underpins the Teesmouth and Cleveland Coast SPA/ pSPA/ Ramsar site designation and, to the north/ east of the indicative site boundary, small areas extend to the boundary of the SSI site;
 - Seal Sands SSSI (approximately 2.9 km west);
 - Seaton Dunes and Common SSSI (2.9 km north west);

- Redcar Rocks SSSI (3 km east); and
- Tees and Hartlepool Foreshore and Wetlands SSSI (4.1 km south west).
- Hydrology/ Flood Risk, Geology and Hydrogeology:
 - The River Tees is approximately 1.6 km to the west of the Main Site. The River Tees is tidal at the location, with the normal tidal limit approximately 14 km upstream (at the Tees Barrage);
 - The North Sea is approximately 0.6 km to the north of the Main Site.
 - There are a number of surface water features in the vicinity of the SSI site:
 - The Dabholm Gut flows to the River Tees approximately 0.8 km south of the Main Site. The Dabholm Gut is tidal and accepts water from:
 - The Fleet (that runs from Coatham Marsh, to the west of Redcar);
 - The Mill Race (from east of the Wilton International complex); and
 - Dabholm Beck (from the west of the Wilton International complex).

The Northumbrian Water Bran Sands sewage treatment plant (to the immediate south of the SSI site) discharges into the Dabholm Gut, as does effluent from the Wilton complex.

- The Environment Agency 'Flood map for planning' indicates that the whole of the Main Site is located within Flood Zone 1 that is defined as, "*land having a less than 1 in 1,000 [less than 0.1%] annual probability of river or sea flooding.*"
- The Main Site is not located near any Groundwater Source Protection Zone.
- Cultural Heritage:
 - There are no scheduled ancient monuments that are likely to be affected by the construction and operation of the Proposed Development at the Main Site. The nearest monument is the 'World War I early warning acoustic mirror 650 m north west of Bridge Farm' approximately 4.6 km east.
 - There are ten grade II listed buildings within 2 km of the Main Site:
 - The Marsh Farm House and Cottages comprise three listings approximately 500 m to the east of the Main Site;
 - The South Gare Lighthouse is approximately 2 km north of the Main Site.
 - The remainder of the listings are located at Dormanstown and to the west of Redcar.
- Landscape:
 - The Main Site is located within the Tees Lowlands National Character Area (NCA);
 - There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees.

Gas Connection Corridors

- 2.23 The corridors currently under consideration for the development of the gas connection as part of the Proposed Development are shown on Figure 2 (Appendix A). The gas connection route will be designed to avoid, wherever possible, residential areas, designated ecological sites, woodland and other major technical and environmental constraints.
- 2.24 Both the identified indicative gas connection corridors comprise land within the industrial areas of the north and south banks of the River Tees. The corridors are bounded to the east by the Tees Valley Railway Line and it is not intended that a crossing of this line would be required. A description of the environmental constraints for both route options is outlined below.
- 2.25 The following environmental receptors have been identified within the vicinity of the Gas Connection corridors:
- Residential:
 - The town of Dormanstown (approximately 1.0 km east).
 - Traffic and Transport:
 - The following PRowS are located within the corridors, to the east:
 - Bridleway 116/9;
 - Footpath 116/31;
 - Footpath 102/2; and
 - Footpath 102/2A.
 - The corridors cross Tees Dock Road.
 - Ecology:
 - The Gas Connection could potentially affect Teesmouth and Cleveland Coast SPA/ pSPA/ Ramsar site (adjacent, north west).
 - In addition, the following non-European designations could be affected:
 - Seal Sands SSSI (adjacent, west); and
 - Tees and Hartlepool Foreshore and Wetlands SSSI (approximately 100 m south west).
 - Hydrology/ Flood Risk, Geology and Hydrogeology:
 - The Gas Connection corridors cross the River Tees to the south of Dabholm Gut. As discussed, the intention would be to use existing crossing where practicable subject to capacity within the utilities tunnels.
 - The corridors pass through Flood Zone 1, 2 and 3.
 - Cultural Heritage:
 - There are no scheduled monuments, world heritage sites or listed buildings within the Gas Connection corridors.
 - Landscape:
 - There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees.

Electrical Connection Corridors

- 2.26 The corridors currently under consideration for the development of the electrical connection as part of the Proposed Development are shown on Figure 3 (Appendix A).
- 2.27 The following environmental receptors have been identified within the vicinity of the corridors:
- Residential:
 - The town of Dormanstown (adjacent, east).
 - Traffic and Transport:
 - The corridor crosses the A1058 and the A1056 along the western branches whilst crossing the A1058 along the eastern branch.
 - There are a number of rail lines within the western branches of the Electrical Connection corridor;
 - The following PRowWs are located within the Electrical Connection corridors, to the east:
 - Bridleway 116/9;
 - Bridleway 116/10;
 - Bridleway 124/179; and
 - Footpath 102/193.
 - Ecology:
 - There are no European designations or SSSI within or are likely to be affected by the Electrical Connection Corridors.
 - Hydrology/ Flood Risk, Geology and Hydrogeology:
 - The corridors cross:
 - The Fleet (that runs from Coatham Marsh, to the west of Redcar);
 - The Mill Race (from east of the Wilton International complex); and
 - Dabholm Beck (from the west of the Wilton International complex).
 - In addition, a number of drains have been identified within the corridors.
 - The corridors pass through Flood Zone 1 only.
 - Cultural Heritage:
 - A number of listed buildings/ structures are located in the vicinity of the Electrical Connection corridors, whilst seven are located within the corridors (to the south at Lazenby and Lackenby):
 - Old Hall Farmhouse and Garden Wall (Grade II*);
 - 9, Chapel Street (Grade II);
 - 11, Chapel Street (Grade II);
 - Village Hall and Gatepiers (Grade II);
 - Stables Byre Barn and Fold-Yard, circa 10 metres west of Old Hall Farmhouse (Grade II);
 - Grange Farmhouse and Farm Cottage (Grade II); and

- Stable Range adjoining South Side of Old Hall Farmhouse (Grade II).
- Landscape:
 - There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees.

Water Connection Corridors

2.28 The corridors currently under consideration for the development of connections for the supply and discharge of water are based on the reuse/ refurbishment of such existing infrastructure, are shown in Figure 4 (Appendix A). The following environmental receptors have been identified in the vicinity of the identified corridors:

- Residential:
 - There are no residential receptors that are likely to be impacted by the construction and operation of water abstraction and discharge infrastructure within the corridors.
- Traffic and Transport:
 - There are no specific receptors identified within or likely to be affected by the construction and operation of water abstraction and discharge infrastructure within the corridors;
- Ecology:
 - The corridor lies within:
 - The Teesmouth and Cleveland Coast SPA/ pSPA/ Ramsar; and
 - the South Gare and Coatham Sands SSSI that underpins the Teesmouth and Cleveland Coast SPA/ pSPA/ Ramsar site designation
- Hydrology/ Flood Risk, Geology and Hydrogeology:
 - The corridor comprises a number of localised pools/surface water bodies within marshy ground to the north of the Main Site;
 - The corridors cover parts of the North Sea beyond the High Mean Water Springs level and the River Tees;
 - The corridor passes through Flood Zones 1 and 3.
- Cultural Heritage:
 - There are no scheduled monuments, world heritage sites or listed buildings within the corridors.
- Landscape:
 - There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees.
 - 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.”

Onshore CO₂ Transport Pipeline Corridor

2.29 The corridor currently under consideration for the development of the onshore CO₂ pipeline, as part of the Proposed Development, is shown on Figure 4 (Appendix A). The following environmental receptors have been identified in the vicinity of the identified corridor:

- Residential:
 - The towns of:
 - Dormanstown (approximately 1.1 km southeast); and
 - Redcar (approximately 1.6 km east).
- Traffic and Transport:
 - There are no specific receptors identified within the corridor;
 - Bridleway 116/32 lies to the east of the corridor.
- Ecology:
 - The corridor lies within:
 - The Teesmouth and Cleveland Coast SPA/ pSPA/ Ramsar; and
 - the South Gare and Coatham Sands SSSI that underpins the Teesmouth and Cleveland Coast SPA/ pSPA/ Ramsar site designation
- Hydrology/ Flood Risk, Geology and Hydrogeology:
 - The corridor comprises a number of localised pools/surface water bodies within marshy ground to the north of the Main Site.
 - The corridor passes through Flood Zones 1 and 3.
- Cultural Heritage:
 - There are no scheduled monuments, world heritage sites or listed buildings within the corridor.
- Landscape:
 - There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees.
 - 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.”
- Other:
 - There is an existing offshore gas pipeline running to the south of the corridor through to the CATS gas terminal at Seal Sands;
 - There is an existing offshore wind farm located to the north of the corridor.

CO₂ Gathering Network Corridors

- 2.30 The corridors currently under consideration for the development of the CO₂ gathering network pipelines to be included as part of the Proposed Development, are shown on Figure 4 (Appendix A). As shown, there is a large overlap between these corridors and those for the Gas Connection Corridors and the Electrical Connection Corridors. As such, the constraints identified within this section are additional to those identified above, and relate to the three potential routes that extend to the west, towards Billingham.
- 2.31 The following environmental receptors have been identified in the vicinity of the identified corridors:
- Residential:
 - The areas of:
 - Billingham (approximately 700 m west); and
 - Port Clarence (adjacent, north of southwest branch).
 - Traffic and Transport:
 - The corridors cross the A178 and follow the routes of the A1046 and, partially, the A1185 and B1275;
 - The corridors cross the Stockton to Hartlepool railway line;
 - There are no PRowS crossing or adjacent to the corridors.
 - Ecology:
 - The corridor routes have been selected to follow existing pipework that passes through ‘gaps’ in the designation of the Teesmouth and Cleveland Coast SPA/ pSPA/ Ramsar site (west and central branches).
 - The eastern branch has been selected as a further option that passes around (adjacent to in some locations) the above designation.
 - Hydrology/ Flood Risk, Geology and Hydrogeology:
 - The west and central corridors bound or pass a number of localised pools/surface water bodies within marshy ground; the Saltholme Brone Reservoirs are located to the north of the west corridor.
 - The west corridor follows the route of Belasis Beck.
 - The corridors pass through Flood Zones 1, 2 and 3 and include some land that benefits from flood defences.
 - Cultural Heritage:
 - There is one listed building within the corridors:
 - Haverton Hill and Port Clarence War Memorial (Grade II).
 - Landscape:
 - There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees.

3. Proposed Development

The Proposed Development

- 3.1 The Proposed Development comprises the construction and operation of a gas-fired CCGT generating station with a net electrical output of up to 2,100 MW. It will incorporate equipment required for the capture of carbon dioxide (CO₂) emissions from the generating station with a design removal efficiency of up to 90%. In addition, there is a need for supporting infrastructure and connections to facilitate the Proposed Development and to integrate it to the wider industrial carbon capture network. Further details on the key elements of the Proposed Development are discussed in this section.

Generating Station

- 3.2 The generating station will comprise up to three CCGT units each with a generating capacity of approximately 700 MW following application of carbon capture and compression equipment. It is expected that the generating station will be designed on a modular basis such that each 'power island' will be the same, comprising:
- One gas turbine;
 - One steam turbine;
 - One heat recovery steam generator (HRSG);
 - Selective catalytic reduction (SCR) equipment for the removal of nitrogen oxides from the flue gas;
 - One or two stacks for the discharge of emissions to air;
 - Natural gas conditioning equipment;
 - One or more auxiliary boilers and/ or diesel generators;
 - Transformers (for the import and export of electricity); and
 - Ancillary equipment (e.g. air compressors, pumps, chemical storage, fan coolers)
- 3.3 Natural gas (conditioned to the required temperature, pressure, etc.) will be combusted in the gas turbine. The hot combustion product gases expand across the blades within the gas turbine causing it to rotate and drive an electrical generator. The gas turbine exhaust gases are passed through the HRSG to recover the useful heat within them in order to produce steam (at various pressure levels) for use within the steam turbine, or to serve other steam requirements within the generating station or wider Proposed Development. Emissions from the HRSG, in a traditional CCGT plant, would then be released from a stack dedicated to each power island.
- 3.4 Spent steam from the steam turbine will be cooled and condensed with the resultant condensate returned to the HRSG for reuse. Water used within this steam/ water cycle will need to be of extremely high purity. Nevertheless, the continuous evaporation and condensing of water within the cycle can cause a build-up of residual dissolved solids within the pipe work. It is, therefore, necessary to purge a small amount of the recirculating water (known as boiler blowdown). Any blowdown removed from the cycle will need to be made-up with fresh demineralised water.

- 3.5 A water treatment plant (WTP) will therefore be used to treat raw water in order to remove (almost) all of the dissolved solids present and provide make-up water to the steam/ water cycle. The design of the Proposed Development may include individual WTPs for each power island or include for a larger WTP serving the whole generating station.
- 3.6 There are a number of options for the provision of the cooling duty for the condensation of steam exiting the steam turbine:
- Wet Cooling:
 - once-through (direct);
 - draft:
 - Natural;
 - Forced;
 - Dry Cooling:
 - Air-cooled condensers.
 - Hybrid Cooling, representing a combination of both wet and dry cooling.
- 3.7 The cooling technology for the Proposed Development is subject to on-going feasibility studies and the decision on the preferred technology will be determined through a determination of Best Available Techniques (BAT), which appraises a range of factors including: environmental impact, plant efficiency and capital and operating costs. Water availability and the effects of any discharge of used cooling water will be key considerations in determining BAT for the choice of cooling technology. The feasibility studies will also determine how the cooling technology for the Proposed Development as a whole will be installed (e.g. on a modular basis for each element or as a 'block' providing all of the cooling duty for the whole plant).
- 3.8 Auxiliary boilers and/ or diesel generators would be installed at the site in order to provide heat/ steam and a source of electricity (if not externally available) during start-up or shutdown.

Selective Catalytic Reduction (SCR)

- 3.9 Natural gas is an inherently clean fuel and its combustion is highly efficient. As such the combustion gases from a typical CCGT plant contain negligible amounts of sulphur dioxide (SO₂) and particulate matter. In addition, the optimisation of combustion within a gas turbine is well understood such that the emissions of oxides of nitrogen (NO_x) and carbon monoxide (CO) are carefully controlled by design and through the implementation of primary control measures.
- 3.10 However, in July 2017, revised BAT Conclusions for Large Combustion Plants were published, which set out the Achievable Emission Levels for combustion plant including new CCGTs, and those levels may not be achievable for high efficiency CCGTs when using primary control measures alone.
- 3.11 In addition, the Proposed Development will capture the CO₂ from the exhaust gases from the gas turbine/ HRSG before their release to air. The capture plant is described below, but will use an absorption process with a regenerable media that may be degraded in the presence of NO_x. Therefore additional NO_x control measures may be required for the Proposed Development.

- 3.12 SCR is a secondary abatement technique involving the injection of ammonia into the flue gas to react with the NO_x present in the presence of a catalyst. The SCR equipment, if required, will be installed within the HRSG, as is typical practice within the power industry and space will be made within the plant footprint to accommodate SCR if required.
- 3.13 The level of NO_x removal (if any) required by the Proposed Development is the subject of on-going technical studies regarding the capture plant and emission limits that will be required to be met from the generating station and will be dependent upon (amongst other matters) the sensitivity of the carbon capture absorbent to NO_x. These studies will seek to optimise the operation of a plant as whole in order to maximise efficiency and minimise emissions/ wastes from the Proposed Development.

Capture Plant

- 3.14 The capture plant will be designed to capture approximately 90% (w/w) of the CO₂ emitted from the generating station. At full load, this could equate to a capture of 1.7 to 2 million tonnes of CO₂ per power island (5.1 to 6 million tonnes, total) per year, dependent upon the turbine equipment chosen.
- 3.15 As with the generating station, it is expected that the capture plant will be designed such that each power island will be served by a dedicated 'capture facility' (as one train). Each capture facility will be the same, comprising primarily of:
- flue gas pre-treatment, including cooling/ scrubbing;
 - CO₂ absorption column (absorber);
 - CO₂ removal column (stripper);
 - one or more auxiliary boilers and/ or diesel generators; and
 - ancillary equipment (e.g. air compressors, pumps, chemical storage, external pipework).
- 3.16 Prior to their introduction into the absorber column, the flue gases from the generating station will be cooled to the required design temperature (c.45°C) possibly by using a large gas/ gas heat exchanger in conjunction with a fine water spray in a column. The design of the cooling system will be made in order to achieve the optimum level of heat transfer.
- 3.17 Once cooled, the flue gases from the generating station will be introduced to an absorber column. In the column, the flue gases will be treated with an absorption solvent that will remove the CO₂ from the gas stream. The solvent to be used is the subject of on-going technical studies, but will likely be an aqueous solution of ammonia, amines and amino acid salts. The alkaline nature of the solvent will mean that it will selectively absorb acidic gases such as CO₂.
- 3.18 The CO₂-lean flue gases will then exit from the top of the absorber column from where they will be routed to the base of the generating station stack for dispersion to atmosphere. Dependent upon the solvent to be used in the absorber (and, particularly, its volatility), a flue gas washing unit may be installed to remove entrained solvent from the flue gases prior to their release to the atmosphere.
- 3.19 CO₂-rich solvent will leave the absorber column and pass to a stripper column for regeneration. The stripper column uses heat to release the CO₂ from the solvent. The hot CO₂-lean solvent leaves the stripper column and is recirculated, likely via a heat exchanger, back to the top of the absorber column.

- 3.20 As discussed above, the performance of the solvent may degrade in the presence of NO_x . NO_x is also an acidic gas that will bind to the alkaline solvent. Absorption of non- CO_2 gases will reduce the 'capacity' of the solvent for the absorption of CO_2 . In addition, the absorption of NO_x into the solvent could create salts which would mean that the NO_x would not be released from the solvent. Therefore the SCR abatement system is likely to be required to minimise NO_x levels entering the carbon capture system, although it will not be possible to entirely remove NO_x or other impurities from the flue gases from the generating station, therefore, some solvent will need to be purged and made-up with fresh solvent.
- 3.21 The CO_2 stream exiting the top of the stripper column will be passed through a condenser in order to remove any water and solvent vapours present in the stream for return to the stripper column. The CO_2 stream will then pass to the CO_2 conditioning/ compressor station.
- 3.22 The electrical, steam, water and air circuits of the generating station and the capture plant will be integrated as far as is technically practicable in order to minimise the use of energy at the Proposed Development. For example, steam will be able to be provided to the capture plant from the HRSG of the generating station and, once used, returned to the HRSG for re-use.
- 3.23 Similarly, the on-going feasibility studies are examining the preferred solution in respect of any cooling requirements for the capture plant and how these will be implemented on-site (i.e. modular basis or otherwise).
- 3.24 As per the generating station, auxiliary boilers and/ or diesel generators may be used for the controlled start-up and shutdown of the capture plant. However, the current design basis is that an electrical start-up heater would be installed (for fuel gas treatment) and that power would be available to the Proposed Development for start-up.

Fuel

- 3.25 Natural gas will be used as the sole fuel for operation of the CCGT. Subject to agreement with NGG, natural gas will be supplied via a tie-in to the high-pressure gas transmission network in the area. It is currently anticipated that this will be at the feeder from the Central Area Transmission System (CATS) gas processing terminal to the north of the River Tees, approximately 3.7 km west of the SSI site. An Above Ground Installation (AGI) will be required at the connection point to the transmission system and a gas receiving station will be required on Site.
- 3.26 The route corridor being considered for connection to the high-pressure transmission system is shown in Figure 2 (Appendix A).

Electrical Connection

- 3.27 The existing electrical infrastructure in the area comprises 275 kilovolt (kV) and 400 kV overhead lines as well as lower voltage underground cables that serve, amongst others, three substations within the wider SSI site.
- 3.28 In order to export electricity from the Proposed Development, engagement is ongoing with National Grid to identify the preferred connection option. It is anticipated that the Proposed Development will require a direct connection to the 400 kV system, due to its total electrical generation capacity.

- 3.29 A 400 kV overhead line runs approximately northwest/ southeast approximately 3.5 km southwest of the SSI site, at its nearest point (Lackenby Substation). The Lackenby Substation steps down the voltage to 275 kV along an overhead line that runs northeast to a point approximately 500 m south of the SSI site.
- 3.30 The size, timing and location of any connection to the NETS will be determined in consultation with National Grid. At this stage several options are under consideration and the potential route corridors being considered are shown in Figure 3 (Appendix A).

Water Connections

- 3.31 As per Paragraph 3.8, water may be used to provide all (or part) of the cooling duty of the generating station, and the associated equipment for CO₂ capture, receipt (from off-site industrial users), treatment and compression. The former Redcar Power Station, that is located to the west of the Main Site, benefitted from an extant abstraction licence for cooling water from the River Tees.
- 3.32 The cooling technology for the Proposed Development is subject to on-going feasibility studies, including an analysis of water requirements and availability. As part of these studies, the Applicant is currently examining the potential for utilising the existing abstraction infrastructure and licence to supply water to the Proposed Development. If determined to be feasible, it is likely that works would be required in order to upgrade the existing abstraction infrastructure (e.g. to comply with the Eels (England and Wales) Regulations 2009, as amended). If reuse is not possible, replacement of such infrastructure is anticipated, along the same or a similar route within the Water Connection Corridors.
- 3.33 Similarly, there are two existing water discharge outfalls within the Water Connection Corridors. These outfalls were for the separate discharges of water from the coke ovens and the Redcar Power Station. As with the abstraction infrastructure, the Applicant is examining the potential for the reuse of these existing assets which, if possible, would likely require upgrading works. Again, if reuse is not possible, replacement of such infrastructure is anticipated, along the same or similar route(s) within the Water Connection Corridors.
- 3.34 Cooling water would represent the largest proportion of water use within the Proposed Development. Small amounts of process water will be required, e.g. in order provide make-up to the steam/ water cycle of the generating station and associated CO₂ equipment within the Main Site. There will also be a requirement for water for domestic/ sanitary use within the Main Site.
- 3.35 The comparatively smaller water demands could be served by water abstracted from the River Tees, following suitable pre-treatment, and/ or may be provided from the local potable water supply. Pre-treatment would still be required where such water is to be used as make-up to the steam/ water cycle.
- 3.36 Discharge of waste water, particularly domestic/ sanitary effluent, could be to the local sewerage system or adjacent Northumbrian Water Bran Sands sewage treatment plant.
- 3.37 The Proposed Development also has the potential for direct connections to the Bran Sands sewage treatment plant for the direct supply of treated water (that would otherwise discharge to the River Tees) to the Main Site. This, as above, is the subject of on-going technical studies and may be considered, following appropriate consultation with Northumbrian Water.

CO₂ Transport

- 3.38 The CO₂ stream from the capture plant will be saturated with water and contain traces of oxygen. In order to maximise the efficiency of the Proposed Development, whilst maximising the CO₂ storage capacity of the selected storage site, the CO₂ will need to be conditioned prior to its export from the Site.

Conditioning/ Compressor Station

- 3.39 The conditioning/ compressor station will purify the CO₂ stream prior to its export through the CO₂ pipeline. The conditioning equipment/ processes are the subject of on-going technical studies, however, it is envisaged that the captured CO₂ stream will be cooled and partly compressed before the trace oxygen and water are removed.
- 3.40 Once treated, the CO₂ stream will be compressed to the order of 120 to 160 barg (liquid, 'dense phase') before cooling and its subsequent introduction into the CO₂ pipeline.

Industrial CO₂ Connectivity

- 3.41 It is recognised that the area identified for the Proposed Development has been actively engaged in the development of industrial CCS solutions for some time, led by the Teesside Collective. It is also recognised that the UK Government recently published its Clean Growth Strategy which included CCUS as part of the strategy for decarbonisation.
- 3.42 It is therefore intended that the Proposed Development facilitates future third party industrial carbon capture connections to the offshore storage site. The technical evaluation of this is ongoing and may require the use of a compression booster station on land within the Main Site, together with a CO₂ gathering network to allow different users to connect carbon dioxide streams of different pressures into the pipeline system.
- 3.43 The CO₂ gathering network will have a design capacity of the order of 4 million tonnes of CO₂ per annum that will feed to the compression booster station for subsequent export of the industrial CO₂, in addition to the CO₂ captured from the generating station.

CO₂ Transport Pipeline

- 3.44 CO₂ captured from the generating station and any industrial emitters connected to the CO₂ Gathering Network will be transported offshore via a new onshore pipeline that will pass the dense phase liquid to a subsea pipeline for onward transportation to the storage site. The onshore pipeline will have a diameter of up to 800 millimetres and will be installed below ground, with the depth increasing for areas below key receptors or infrastructure. The pipeline route will need to cross the Teesmouth and Cleveland Coast Special Protection Area (SPA), an internationally designated ecological site for the conservation of wild birds. Appropriate consideration will therefore be given to the construction of the pipeline through the SPA so as to minimise disturbance and impacts.
- 3.45 The Pipeline Safety Regulations 1996 do not consider an on-shore high pressure CO₂ pipeline is a Major Accident Hazard Pipeline (MAHP). However, given the volume of CO₂ to be exported, the CO₂ pipeline will be designed, installed and operated as if it were a MAHP, and the high pressure CO₂ were to be classified as a 'dangerous fluid'. A Major Accident Prevention Document (MAPD) will be produced during the design process and the Health and Safety Executive (HSE) will be fully consulted during the design and planning processes.
- 3.46 The route corridor considered for the onshore section of the CO₂ pipeline is shown in Figure 4 (Appendix A).

- 3.47 Offshore, the pipeline route determination and assessment of impact will be addressed through separate consent supported by a separate EIA.

Material Storage on Site

- 3.48 At this stage it is not considered that on-site storage of compressed carbon dioxide will be required. However, a number of chemicals will be required to be stored and used on Site in the CCGT and capture plant. Some of these materials will be classed as Hazardous. Where any substance could pose a risk to the environment through its uncontrolled release (e.g. surface water drains), the substance will be stored within appropriate containment facilities including (but not limited to) impermeable concrete surfaces and appropriately designed and sized bunds.
- 3.49 The inventory of materials to be stored on Site will be developed through the design process. However, where storage of hazardous materials – individually or in-combination – exceeds the relevant thresholds, separate permissions will be sought from the Health and Safety Executive (HSE) and local planning authority as appropriate for their storage, under the Hazardous Substance Consent and Control of Major Accident Hazards (COMAH) regimes.

4. Consideration of Alternatives

Introduction

- 4.1 The EIA Regulations require that an ES should include an outline of the main 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 actually been considered.
- 4.2 For the Proposed Development only alternative development sites have been considered, at this stage. It is also anticipated that alternatives will be considered regarding:
- the layout of the Proposed Development including the choice and configuration of the CCGT units;
 - the capture plant technology to be selected;
 - the cooling technology to be implemented;
 - the route corridor for the connection to the high-pressure gas network;
 - the route corridor for the connection to the NETS; and
 - the route corridor for the on-shore portion of the CO₂ transport pipeline.
- 4.3 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. 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 approach outlined in PINS Advice Note 9.

Site Selection

Overview

- 4.4 A wide site selection process was undertaken for the Proposed Development, considering potential brownfield sites available for redevelopment that met key project criteria, including land area availability, proximity to the east coast of the UK, proximity to gas and grid transmission systems, water availability and minimising impacts on identified sensitive receptors.
- 4.5 This process resulted in a shortlist of sites being identified. Further refinement of the shortlist has taken place taking into account additional considerations such as opportunities to connect industrial carbon dioxide streams into the pipeline infrastructure, local planning policy and stakeholder engagement. Through this process, the SSI site was identified as the preferred site for the Proposed Development.

- 4.6 The Applicant has since consulted with the South Tees Development Corporation (STDC) regarding the siting of the Proposed Development within the wider landholding, and four potential plots were identified. A multi-criteria analysis (MCA) of the four plots was undertaken in order to rank them in order of preference and through this process, the plot identified in Figure 1 (Appendix A) was selected.
- 4.7 The preferred plot for the Proposed Development is the land encompassed within the indicative site boundary (subject to finalising the boundary within the SSI site, although reorientation is unlikely to change this conclusion). The site balances the proximity to the coast with the former land use and the distances required for electrical, gas and water connections.

5. Planning Policy

- 5.1 This section details the main planning and energy policy documents taken into account in terms of defining the scope of the EIA.
- 5.2 The application for a DCO for the Proposed Development will be accompanied by a Planning Statement that will identify national and local planning policies relevant to the construction and operation of the Proposed Development. The Planning Statement will discuss each policy in detail and provide an assessment as to how the Proposed Development accords with each one.

Clean Growth Strategy

- 5.3 The 'Clean Growth Strategy' (BEIS, 2017) sets out the aims of the UK Government to deliver increased economic growth whilst decreasing emissions. As such, in order to deliver on these aims, the Strategy recognises that, *"the UK will need to nurture low carbon technologies, processes and systems..."*
- 5.4 The Strategy provides policies and proposals that are anticipated to drive emissions down throughout the next decade, with a focus on the achievement of the fifth carbon budget through domestic action in the UK. Of these proposals, the UK Government intends to:
- Publish joint industrial decarbonisation and energy efficiency action plans with seven of the most energy intensive industrial sectors;
 - Demonstrate international leadership in carbon capture usage and storage (CCUS), by collaborating with global partners; and
 - Work in partnership with industry, through a new CCUS Council, to put the UK on a path to meet its ambitions of having the option of deploying CCUS at scale in the UK, and to maximise its industrial opportunity.
- 5.5 The Strategy states:
- "There is a broad international consensus that carbon capture, usage and storage (CCUS) has a vital future role in reducing emissions. This could be across a wide range of activities such as producing lower-emission power, decarbonising industry where fossil fuels are used and/or industrial processes as well as providing a decarbonised production method for hydrogen which can be used in heating and transport. This makes CCUS a potentially large global economic opportunity for the UK."*
- 5.6 The UK Government is committed, *"to maximise innovation to develop world leading technologies and to seek the maximum possible benefits from investment for improving the productivity of the UK economy."*
- 5.7 The Strategy re-affirms the commitment to deploying CCUS in the UK, highlighting on-going work with the Teesside Collective (amongst others) to test the potential for the development of CCUS industrial decarbonisation clusters, such as may be realised by the Proposed Development

National Planning Policy

Planning Act 2008

- 5.8 As per Section 1, Under Section 31 of the PA2008, a DCO is required to authorise a NSIP. Development consent may also be granted for associated development, as defined by Section 115 of the PA2008.
- 5.9 The PA2008 requires new policy to inform decisions on NSIPs in England and Wales. Policy for such infrastructure is set out in National Policy Statements (NPS). Section 104 of the PA2008 requires the Secretary of State to determine applications for NSIPs in accordance with the relevant NPSs.
- 5.10 In making decisions on applications for NSIPs, Section 104 also states that the Secretary of State must also have regard to any other matters that they consider to be both 'important and relevant' to their decision. Paragraph 4.1.5 of '*Overarching National Policy Statement for Energy (EN-1)*' (2011) provides some clarification on the other matters that the Secretary of State may consider both important and relevant. It confirms that these may include development plan documents or other documents in the local development framework.
- 5.11 EN-1 is clear (reflecting the terms of the PA2008), however, that in the event of a conflict between these and any other documents and a NPS, the latter prevails for the purposes of Secretary of State decision-making given the national significance of the infrastructure concerned.

National Policy Statements

- 5.12 In July 2011, the Secretary of State for the Department of Energy and Climate Change (DECC)² designated a number of NPSs relating to nationally significant energy infrastructure. The NPSs that are considered to be of relevance to the Proposed Development include:
- '*Overarching National Policy Statement for Energy (EN-1)*' (2011);
 - '*National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2)*' (2011);
 - '*National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)*' (2011); and
 - '*National Policy Statement for Electricity Networks Infrastructure (EN-5)*' (2011).
- 5.13 These documents, from a planning policy perspective, have been the main focus in terms of scoping the EIA.
- 5.14 Part 3 of EN-1 sets out the 'need' that exists for nationally significant energy infrastructure. Paragraph 3.1.1 states that the UK needs all the types of energy infrastructure covered by EN-1. This covers a range of electricity generating capacity, including fossil fuel power stations that are either carbon capture ready (CCR) or, as will be the case with the Proposed Development, fitted with carbon capture plant and the means to transport the CO₂ to a suitable geological feature. Paragraph 3.1.2 goes on to state that it is for industry to propose new energy infrastructure and that the Government does not consider it appropriate for planning policy to set targets for or limits on different technologies.

² In July 2016, DECC became part of BEIS. BEIS now has responsibility for ensuring the provision of secure energy supplies in the UK.

- 5.15 Part 4 of EN-1 sets out a number of ‘assessment principles’ that must be taken into account by applicants and the Secretary of State in preparing and determining applications for nationally significant energy infrastructure. General points include (paragraph 4.1.2) the requirement for the Secretary of State, 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 PA2008 (noted above) apply.
- 5.16 Paragraph 4.1.3 goes on to state that in considering any project, and in particular, when weighing its adverse impacts against its benefits, the Secretary of State should take into account of:
- its potential benefits, including its contribution to meeting the need for energy infrastructure, job creation and any long-term or wider benefits; and
 - its potential adverse impacts, including any long-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts.
- 5.17 Paragraph 4.1.4 continues by stating that within this context, the Secretary of State should take into account environmental, social and economic benefits and adverse impacts, at national, regional and local levels.
- 5.18 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’; consideration of combined heat and power (CHP); consideration of CCS; climate change adaptation; and grid connection, amongst others.
- 5.19 Part 5 of EN-1 lists a number of ‘generic impacts’ that relate to most types of energy infrastructure, which both applicants and the Secretary of State should take into account when preparing and considering applications. These include air quality and emissions; biodiversity; landscape and visual; and flood risk impacts, amongst others. 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. In relation to each of the generic impacts listed within Part 5 of EN-1, guidance is provided on how the applicant should assess these within their application and also the considerations that the Secretary of State should take into account in decision-making.
- 5.20 The other NPSs (EN-2, EN-4 and EN-5) set out the factors that may influence site selection and a number of technology-specific considerations to be taken into account in preparing and determining application.

National Planning Policy Framework

- 5.21 The National Planning Policy Framework (NPPF) was adopted in March 2012 and replaced the majority of Planning Policy Statements and Planning Policy Guidance Notes. The policies contained within the NPPF are expanded upon and supported by the ‘Planning Practice Guidance’, which was published in March 2014 (and most recently updated in July 2018).

- 5.22 The NPPF sets out the Government planning policies for England and how these are to be applied. It is a material consideration in planning decisions. Paragraph 5 of the NPPF makes it clear that the document does not contain specific policies for NSIPs and that applications in relation to NSIPs are to be determined in accordance with the decision making framework set out in the Planning Act 2008 and relevant NPSs, as well as any other matters that are considered both important and relevant. However, paragraph 5 goes on to confirm that matters that can be considered to be both important and relevant to NSIPs may include the NPPF and the policies within it.
- 5.23 Policies of particular relevance to the scope of the EIA include promoting sustainable transport; requiring good design; promoting healthy communities; conserving and enhancing the natural and historic environment; and meeting the challenge of climate change and mitigating its effects.

Planning Practice Guidance

- 5.24 The policies contained within the NPPF are expanded upon and supported by the 'Planning Practice Guidance', which was published in November 2016. The guidance has been revised and updated (most recently in October 2018).

Local Planning Policy

- 5.25 The land considered for the Proposed Development is located within the administrative boundaries of RCBC and STBC. This section provides an overview of the current status of local planning policy together with future changes that have been identified as having a potentially material effect on the consideration of an application for development consent for the Proposed Development.
- 5.26 The Proposed Development site is located within the administrative boundaries of both RCBC and STBC. This section provides an overview of the current status of local planning policy together with future changes that have been identified as having a potentially material effect on the consideration of an application for development consent for the Proposed Development.
- 5.27 The Local Development Plan (LDP) for RCBC consists of:
- the Redcar & Cleveland Local Plan & Proposals Map (adopted May 2018); and
 - the Tees Valley Joint Minerals and Waste Development Plan Document (DPD) (adopted September 2011), comprising of:
 - Minerals and Waste Core Strategy DPD; and
 - Mineral and Waste Policies and Sites DPD.
- 5.28 The Joint Minerals and Waste DPD is of limited relevance to the Proposed Development.
- 5.29 RCBC has also produced a South Tees Area Supplementary Planning Document (SPD), which was also adopted in May 2018.
- 5.30 The LDP for STBC consists of:
- the Stockton-on-Tees Local Plan & Policies Map (adopted January 2019); and
 - the Tees Valley Joint Minerals and Waste Development Plan Document (DPD) (adopted September 2011)

Redcar & Cleveland Local Plan

- 5.31 The Redcar & Cleveland Local Plan was adopted in May 2018. The Plan sets out the vision and overall development strategy for RCBC's area and how it will be achieved for the period until 2032.

South Tees SPD

- 5.32 The South Tees SPD was also adopted in May 2018. Figure 2 of the SPD shows indicative clusters/areas for key industries and processes. The SSI site is identified for manufacturing and energy.
- 5.33 SPD Development Principle STDC6 'Energy Innovation' supports new energy generation within the South Tees Area, including the promotion of innovative energy projects. Paragraph 3.49 encourages the provision, not only of nationally significant energy projects within the South Tees Area, but also on-site energy generation that is capable of meeting the needs of the planning development zones and regenerated land.

Stockton-on-Tees Local Plan

- 5.34 The Stockton-on-Tees Local Plan was adopted in January 2019. The Plan sets out the detailed vision for the Borough up to 2032.

Other Documents Considered

South Tees Regeneration Master Plan

- 5.35 The STDC '*South Tees Regeneration Master Plan*' (2017, "RMP") presents the vision, strategy and ideas for the transformational regeneration of the STDC area to be delivered in accordance with ten core principles that underpin the strategy. The RMP seeks to bring new opportunities for investment into the area in addition to maximising the economic/ development opportunities for existing major operators within the area and neighbouring industry.
- 5.36 The RMP has been based on, "*extensive desk based research and preliminary physical investigations, together with key stakeholder consultations and early investor interest,*" and seeks to provide flexible framework for regeneration of the South Tees area. It is noted that the RMP is published as a 'live' document that may be revised in response to a number of different factors including; changing local and national policies, economic and market conditions responses to consultation.
- 5.37 Although STDC has an independent board and has been constituted with wide-ranging powers, it is not the Planning Authority. The responsibility for planning within the STDC area remains with RCBC. It is anticipated that the RMP will be adopted as a supplementary planning document (SPD) under the RCBC Local Plan. A separate, but related, 'South Tees Master Plan SPD' has been published for consultation by RCBC.

Tees Valley Combined Authority (TVCA)

- 5.38 The overall aim of TVCA is to maximise investment in the Tees Valley, to achieve its ambitions for the region's economic growth and to take advantage of any opportunity to create more jobs and success for the area. The TVCA has published a suite of 'key strategies' that include:
- Strategic Economic Plan;

- Investment Plan; and
- Infrastructure Plan.

6. Potentially Significant Environmental Issues

- 6.1 The following sections present a discussion of the potential environmental impacts associated with the Proposed Development that it is proposed will be considered as part of the EIA. The methodology and assessment criteria that will be used to assess the potential significance of identified impacts are also outlined alongside potential mitigation measures for implementation following assessment.

Air Quality and Climate

Baseline Conditions

- 6.2 The Environment Act 1995 requires local authorities to review air quality within their district or borough in order to determine where pollutant levels identified in the Air Quality Framework Directive may be in excess of the standards.
- 6.3 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 Action Plan 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.
- 6.4 The most recent publications within the above framework is the '*Annual Report 2016 Air Quality in the Tees Valley 2012 – 2015*' (Tees Valley Environmental Protection Group, July 2016) and the '*2018 Air Quality Annual Status Report*' (RCBC, June 2018).
- 6.5 There are no AQMAs designated within the administrative boundary of RCBC or the adjoining local authority areas of Hartlepool Borough Council and STBC.
- 6.6 RCBC has one continuous monitoring station at Dormanstown focusing on the emissions from the industrial complexes located along the River Tees. The monitor is located in school grounds, in an area of relevant public exposure, and is regarded as a key site within the Tees Valley for monitoring industrial pollution and coastal ozone levels.
- 6.7 In 2014, RCBC implemented a network of 28 diffusion tubes in order to monitor nitrogen dioxide (NO₂) levels within the borough. In 2016 the network was reduced to 20. Of the monitoring undertaken by RCBC, only NO₂ is relevant to the emissions anticipated from the Proposed Development (that will emit NO_x, a source of atmospheric NO₂). CO (that will also be emitted by the Proposed Development) is not monitored by RCBC. Environmental concentrations of amines are, similarly, not monitored by RCBC.
- 6.8 The available monitoring data for 2014 and 2015 indicates that the recorded annual mean concentrations are, generally, less than half of the annual mean objective of NO₂, with the exception of areas to the south of Redcar and at Grangetown. It is also noted that these sites are 'roadside' monitors where the ambient concentrations can be expected to be principally influenced by emission from road traffic.
- 6.9 No exceedances of the short-term (1-hour average) air quality objective for NO₂ were recorded by the Dormanstown automatic monitor.

6.10 Baseline, or existing, background air quality for the area in the vicinity of the Proposed Development will be determined from available monitoring data and Defra background air quality maps (UK-AIR) (Defra, 2016). A summary of currently available data is provided in Table 6.1.

Table 6.1: Background Air Quality Data

Source	Site Type	Averaging Period	Pollutant		
			NO ₂	NO _x (as NO ₂)	CO
Redcar Dormanstown	Suburban industrial	Annual	11.4	15.2	-
		1-hour (max)	99.5	-	-
Background mapping	Estimated (max)	Annual (2018)	19.8	30.1	-
		Annual (2025)	18.8	28.3	-

Source: http://www.airqualityengland.co.uk/site/data?site_id=RED3 ; <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2013>

6.11 The existing air quality concentrations at designated habitat sites in the vicinity of the Proposed Development, and the existing acid and nutrient nitrogen deposition rates at those sites, will be obtained from the UK Air Pollution Information System (APIS), supplemented by data from UK-AIR.

Scope of the Assessment

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

- emission of pollutants to air from the stacks and other emission sources on the plant during operation;
- emission of pollutants to air from vehicles associated with construction, operation and decommissioning of the generating station, capture plant, gas connection and electrical connection; and
- construction dust and mobile plant exhaust emissions generated during construction and decommissioning of the generating station, capture plant, gas connection and electrical connection.

6.13 The Proposed Development, when operational, will emit NO_x and CO, via the stacks that will form part of the generating station. These will include the combustion products NO_x and CO, for which limit values are set by the Air Quality Standards Regulations 2010 (as amended) (AQS). Other pollutants such as amines and amine degradation products may also be emitted from the carbon capture plant.

6.14 The Proposed Development will be designed and operated to comply with the relevant provisions of the Industrial Emissions Directive 2010/75/EU (the IED) and also the July 2017 best available techniques (BAT) conclusions for large combustion plants (LCP BAT Conclusions). The requirements of the IED are transposed into English law via the Environmental Permitting (England and Wales) Regulations 2016 (as amended) (the EPR).

- 6.15 The LCP BAT Conclusions specify Achievable Emissions Levels (AELs) for NO_x and CO that are considered to be achievable through the implementation of BAT within a generating station. The EPR requires that a combustion plant with a thermal input of greater than 50 MW must operate in accordance with an environmental permit issued by the Environment Agency. As part of the permit application process, an operator is required to demonstrate that BAT will be implemented and during permit determination, the EA will set Emission Limit Values (ELVs) for pollutant releases, based on the IED ELVs and the BAT AELs as appropriate.
- 6.16 The potential for the use of SCR and the use of absorption solvent to be used within the capture plant may also result in small emissions of ammonia ('ammonia slip') and/ or amines and amine degradation products. These pollutants will be assessed for potential human health and habitats effects, recognising the nitrogen deposition potential of ammonia and also the lessons learned from the previous carbon capture projects in England and Scotland. Environmental Assessment Levels will be used to assess the potential impact of amine and amine degradation product emissions to atmosphere. It is expected that air monitoring will be undertaken to establish the baseline concentration of such species in the receiving environment in order to establish an acceptable maximum emission level from the plant.
- 6.17 An atmospheric impact assessment will be undertaken for the main point source emissions, utilising air dispersion modelling to assess the process contributions and predicted environmental concentrations of emitted pollutants.
- 6.18 The atmospheric dispersion modelling study of operational emissions will be undertaken using the Atmospheric Dispersion Modelling System (ADMS) model, currently version 5.2. ADMS is widely used by industry and the regulatory authorities.
- 6.19 The modelling will be based on Emission Limit Values set by the IED where available and at full operating load, thereby presenting a worst-case scenario in the ES. Should it be deemed appropriate to model lower loads (e.g. less than all three units operating), justification for this will be provided and the load clearly stated in the assessment. Modelling will be undertaken in accordance with the Environment Agency '*Air emissions risk assessment for your environmental permit*' (2016, "AERA Guidance"). A range of capture scenarios will be considered to evaluate the impacts of the plant running in full capture mode or on bypass. This in turn will be used to establish whether separate bypass stacks are required or not.
- 6.20 The dispersion modelling study will be used to determine the most appropriate height for the generating station stacks based on the resultant maximum short-term and long-term ground level concentrations predicted.
- 6.21 Potential impacts on ecological receptors will be assessed, including statutorily designated habitat sites within 15 km of the proposed stacks and non-statutory habitat sites within 2 km, in accordance with the EA Air Emissions Risk Assessment (AERA) Guidance.
- 6.22 An air quality impact assessment will also be undertaken on the effects of road traffic on the local road network associated with the construction of the Proposed Development (generating station, capture plant, gas connection and electrical connection), in accordance with the Defra '*Local Air Quality Management Technical Guidance LAQM.TG(09)*' (2009). The Highways Agency '*Design Manual for Roads and Bridges*' (DMRB) screening model will be used. Based on the anticipated traffic volumes, it is not currently considered that more detailed modelling would be required. However, should the screening model determine that road traffic could cause potentially significant concentrations of NO_x or CO, more detailed assessment will be undertaken using the ADMS-Roads dispersion model. Both tools have been specifically designed to assess the impact of road traffic emissions in the UK.

- 6.23 In addition, potential impacts and nuisance from site clearance, construction dust and mobile plant exhaust emissions generated during the construction phase of the Proposed Development (generating station, capture plant, CO₂ gathering network, gas connection and electrical connection) and any associated development will be considered using a screening assessment (Institute for Environmental Management and Assessment (IEMA), 2016) and the Institute of Air Quality Management (IAQM) *'Assessment of dust from demolition and construction'* (2014), supplemented by case studies where appropriate. Similar effects during the decommissioning stage will also be considered. Where necessary, mitigation measures will be recommended for the control of dust and site plant emissions during site preparation and construction works to minimise the potential effects.
- 6.24 Given the subjectivity that can occur when attempting to assign a level of significance to a given air quality impact, AECOM has produced a set of quantitative significance criteria for air quality matters. These are based on the regulatory and expert guidance identified above, together with the IAQM *'Guidance on land-use planning and development control: Planning for air quality'* (2017).

Climate Change

- 6.25 It is considered that the Proposed Development will represent a step forward in the implementation of large-scale CCS for power stations that could make a significant contribution to reducing the CO₂ emissions from the power industry and other industry.
- 6.26 A discussion of the greenhouse gas emissions from the power sector in the UK will be provided. The greenhouse gas emissions from traditional CCGT with the same capacity of the Proposed Development will be described and compared with those from the Proposed Development.
- 6.27 This section will draw on the IEMA *'Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance'* (2017) such that it will provide discussion and, where relevant, assessment of:
- Baseline greenhouse gas 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) CO₂ emissions savings throughout the operational life of the Project.

Hydrology & Water Resources

Baseline Conditions

- 6.28 The River Tees is approximately 1.6 km to the west of the indicative DCO site boundary, with the North Sea approximately 0.6 km to the north. The River Tees is tidal at the location, with the normal tidal limit approximately 14 km upstream (at the Tees Barrage).
- 6.29 There are a number of surface water features in the vicinity of the SSI site. The Dabholm Gut flows to the River Tees approximately 0.8 km south of the indicative DCO site boundary. The Dabholm Gut is tidal and accepts water from:

- The Fleet (that runs from Coatham Marsh, to the west of Redcar);
 - The Mill Race (from east of the Wilton International complex); and
 - Dabholm Beck (from the west of the Wilton International complex).
- 6.30 The Northumbrian Water Brand Sands sewage treatment plant (to the immediate south of the SSI site) discharges into the Dabholm Gut, as does effluent from the Wilton complex.
- 6.31 The Environment Agency 'Flood map for planning' indicates that the whole of the SSI site is located within Flood Zone 1 that is defined as, "*land having a less than 1 in 1,000 [less than 0.1%] annual probability of river or sea flooding.*"
- 6.32 The STDC RMP states that, within the SSI site, "*surface water flooding is isolated and not widespread but mechanisms for conveying surface water should be reviewed dependent on the final land usage designation.*"
- 6.33 There are narrow areas around the Dabholm Gut, Fleet and Mill Race that are designated as Flood Zone 2 and 3, which relate to localised flooding of these watercourses.
- 6.34 The Bran Sands Lagoon has a footprint of approximately 24 ha and is located to the north of the Dabholm Gut and west (i.e. on the south bank) of the River Tees.

Scope of the Assessment

- 6.35 The following potential impacts may be associated with the Proposed Development:
- potential temporary changes to surface water flows within Flood Zones 2 and 3 (including functional floodplain) during the construction phase (subject to the preferred route corridors of the connections to the high-pressure gas transmission network and the NETS, and the CO₂ gathering network pipeline(s));
 - Given the tidal nature of the River Tees in this location, the application for a DCO for the Proposed Development may include provisions for a deemed Marine Licence³ to address the following aspects:
 - whilst it is currently being considered as to whether the gas connection and CO₂ gathering network pipeline(s) can be routed via one of the two existing utilities tunnels beneath the River Tees, subject to consultation and available capacity, a new crossing may be required.
 - potential impacts relating to the abstraction of water from the River Tees and/or the North Sea. The proposals for the works at the point of abstraction will include consideration and how these proposals accord with the Eels (England and Wales) Regulations 2009 (as amended);
 - construction and operation of a CO₂ transport pipeline between the Main Site and the proposed storage site in the North Sea (through Flood Zone 3);
 - change to the impermeable area within the indicative DCO site boundary and associated changes to surface water flows during operation;
 - pollution of surface watercourses within or near the Proposed Development (including associated development) 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

³ Consultations regarding the deemed Marine Licence and any associated assessment requirements will be held with the Marine Management Organisation as the EIA/DCO application progresses.

- pollution of surface watercourses within or near the Proposed Development during operation, due to:
 - direct discharge of effluent from any proposed Effluent Treatment Plant (ETP) and/ or water used for cooling water; and
 - spillages or polluted surface water run-off entering the watercourse (if materials are not appropriately stored at the Proposed Development in accordance with the environmental permit and an appropriate environmental management plan/ system, and/or appropriate drainage systems are not implemented and maintained).
- 6.36 There will be no direct discharges to groundwater, however, the potential for fugitive emissions from the Proposed Development and the resultant impacts to groundwater will be considered with the Geology and Hydrogeology assessments.
- 6.37 In accordance with the NPPF and NPS EN-1, applications for energy projects of 1 ha or greater in Flood Zone 1 are to be accompanied by a flood risk assessment (FRA). The FRA will be undertaken based on a surface water drainage strategy for the site that is the subject of on-going studies, 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 results of the FRA will be used to inform the design of the Proposed Development (including finished ground and floor levels)
- 6.38 The assessments of the potential impacts from the direct discharge of effluents and/ or cooling water will be undertaken in accordance with the Environment Agency '*Surface water pollution risk assessment for your environmental permit*' (April 2018).
- 6.39 The direct discharge of effluents and/ or cooling water will also require assessment under the Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (Water Framework Directive, or WFD). The WFD assessment will be undertaken in accordance with the Environment Agency '*Water Framework Directive assessment: estuarine and coastal waters*' (November 2017).
- 6.40 The Environment Agency will be consulted for local water and flood data to inform the assessments.

Geology & Hydrogeology

Baseline Conditions

- 6.41 A review of the site-specific Groundsure report for the SSI site and publicly available British Geological Survey (BGS) borehole records and geological maps indicate that the SSI site is underlain by tidal flat deposits comprising of sand and silt beneath which the bedrock forms part of the Redcar Mudstone Formation. Land to the north of the SSI site comprises blown sand, underlain by the Mercia Mudstone Group.
- 6.42 The superficial geology beneath the SSI site is classified as a secondary A aquifer comprising permeable layers capable of supporting water supplies at a local rather than strategic scale. These are generally aquifers that were previously classified as minor aquifers.

- 6.43 The bedrock beneath the indicative DCO site boundary is classified as a secondary (undifferentiated) aquifer, such that it has not been possible to attribute a specific secondary classification to the bedrock. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type. The bedrock beneath the north-western corner of the SSI site is classified as a secondary B aquifer comprising predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
- 6.44 There are no groundwater Source Protection Zones or Drinking Water Protected Areas/ Safeguard Zones near the SSI site.
- 6.45 There are no licensed groundwater abstractions within or in the vicinity of the SSI site.
- 6.46 The ground beneath the SSI site is currently likely to contain a number of potential contaminants in certain areas of the site from former historic use, potentially including heavy metals, asbestos, sulphates and hydrocarbons relating to the previous iron/ steel making activities at the site. In addition, there is the potential for the presence of underlying steel slag which may present risk of ground heaving and/ or natural subsidence when developed upon. Areas of “potential major hazards” are identified in the STDC RMP to the north of the SSI site in areas previously used for: the coke works, the Redcar blast furnace and the iron and steel works. It is understood that the current operator of the Site intends to address any historic contamination under the Site prior to commencement of the Proposed Development.
- 6.47 The baseline conditions for the development corridors for the connections to the high-pressure transmission network and the NETS, the CO₂ transport pipeline, the CO₂ gathering network pipeline(s) and any water abstraction/ discharge infrastructure will be determined when there is greater certainty as to their routes.

Scope of the Assessment

- 6.48 The following potential impacts may be associated with the Proposed Development:
- disturbance of contaminated soils and contamination perched groundwater and 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 (including the gas connection, electrical connection and the CO₂ transport pipeline) 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 during operation, due to spillages or polluted surface water run-off entering the watercourse (if materials are not appropriately stored at the Proposed Development in accordance with the environmental permit and an appropriate environmental management plan/ system, and/or appropriate drainage systems are not implemented and maintained).

- 6.49 A Phase 1 desk-based assessment (DBA) will be completed to identify potential contaminative uses of the Proposed Development site and identify the potential for land contamination and potential pathways to sensitive receptors. The DBA will consider the potential for contaminants associated with current and historic land use in and around the Proposed Development site to be present within the DCO boundary. As part of the DBA, a conceptual site model will be developed for the land potentially affected by the Proposed Development.
- 6.50 The results of the DBA and conceptual site model 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 will be discussed and agreed in advance with the Environment Agency, RCBC and STBC, as appropriate.
- 6.51 An assessment of potential impacts on existing ground conditions and sterilisation of potential mineral deposits will be undertaken as part of the EIA, including the potential for the Proposed Development to result in land contamination, as defined in the Environment Act 1995 Part 2A (HMSO, 1995). Consideration will also be given to potential impacts associated with the construction and operation of the Proposed Development and how these will be prevented or minimised.
- 6.52 As appropriate, the EIA will inform the design as to where mitigation measures may be required during Proposed Development construction, operation or decommissioning. These 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 Site will undertake appropriate site clean-up prior to commencement of the Proposed Development. It 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.

Noise & Vibration

Baseline Conditions

- 6.53 The Proposed Development will be located within the SSI site, which is remote from larger areas of residential receptors, although it is noted that there are areas of public/ private amenity close to its boundary.
- 6.54 The nearest residential settlements are the town of Redcar (approximately 1.6 km east), including the borough of Dormanstown (approximately 1.1 km southeast).
- 6.55 In addition, the Teesmouth and Cleveland Coast SPA/ Ramsar site and the South Gare and Coatham Sands SSSI are located immediately north of the SSI site.
- 6.56 Consultation with RCBC, Natural England and other key stakeholders will be undertaken in order to determine specific noise sensitive receptors (NSR) and/ or representative locations at which noise surveys will be undertaken in order to establish the baseline noise conditions within the vicinity of the Proposed Development site.

Scope of the Assessment

- 6.57 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);
 - operational noise impacts from the new plant; and
 - operational noise impacts from road traffic on public roads.
- 6.58 Based on the distance between the indicative DCO site boundary and the nearest receptors, significant vibration impacts associated with operational activities are considered unlikely, although they will still be considered as part of the EIA.
- 6.59 The scope of the noise and vibration assessment will be:
- identification of nearest noise sensitive receptors;
 - liaison with local planning authorities and Natural England to agree scope and methodology of noise assessment, including baseline noise monitoring locations and measurement protocol;
 - establishment of baseline noise levels in the locality; and
 - assessment of the impact of predicted noise levels at the nearest noise sensitive receptors from the construction, operation and decommissioning of the proposed power station and associated connections, including:
 - construction noise and vibration (including construction traffic on public roads); and
 - operational noise and vibration (including site traffic on public roads).
- 6.60 The noise and vibration assessment will be carried out in accordance with the following guidance:
- ‘*Noise Policy Statement for England*’ (2010); and
 - Planning Practice Guidance for ‘*Noise*’ (2014).
- 6.61 Additionally, reference will be made, but not be 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 ‘*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”); and
 - DMRB Volume 11 Section 3 Part 7 HD213/11 ‘*Noise and Vibration*’ (Highways England, 2011).

- 6.62 Baseline noise monitoring requirements will be agreed in advance with RCBC. The monitoring procedures will conform to BS 7445: 2003 '*Description and Measurement of Environmental Noise*', and monitoring will be undertaken in close proximity to NSRs at both weekend and weekday times, ideally (subject to adequate security and access) over a minimum five day unmanned monitoring period (Thursday to Monday suggested).
- 6.63 Noise levels associated with enabling and construction works will be calculated (at chosen sensitive receptors) using the data and procedures given in BS 5228. The need for prediction of vibration levels will be further considered depending upon the types of activities required. Additionally, noise increases at sensitive receptors due to any construction traffic on public roads will be calculated according to the methods given in CRTN. The assessment of construction works will include the electrical, water and gas connections.
- 6.64 The operational noise impact of the Proposed Development will be predicted using computer noise modelling software (SoundPLAN or Cadna-A), based on information on plant layout, and the operating conditions and the levels of noise generated by plant items and vehicles, as provided by the client. 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.
- 6.65 The significance of the noise impact of the Proposed Development during operation will be assessed using the method given in BS 4142 and World Health Organisation (WHO) guidance (WHO, 2009). BS 4142 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.
- 6.66 Additionally, the tonal, impulsive and irregular characteristics of the noise emissions from the proposed generating station and carbon capture plant will be considered and assessed against the prevailing noise climate to the sensitive receptors.
- 6.67 The construction of the Proposed Development may have a potentially significant impact on traffic flows on local roads around the 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 traffic and transport assessment (see Traffic and Transport).
- 6.68 The significance of changes in road traffic noise levels will be assessed based on a range of relevant guidance including the DMRB.

Ecology & Nature Conservation

Baseline Conditions

- 6.69 The Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations') provide for the ecological designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites.

- 6.70 The Teesmouth and Cleveland Coast SPA/ pSPA/ Ramsar site is located approximately 240 m north of the SSI site (at its nearest point). The site includes a range of coastal habitats (sand- and mud-flats, rocky shore, saltmarsh, freshwater marsh and sand dunes) on and around the Tees Estuary. Together, these habitats provide feeding and roosting opportunities for important numbers of waterbirds in winter and during passage periods. In summer Little Tern (*Sterna albifrons*) breed on beaches within the site, while Sandwich Tern (*Sterna sandvicensis*) are abundant on passage.
- 6.71 There are no other European sites within 5 km of the SSI site. However, as discussed in 'Air Quality and Climate' (above), the prevailing guidance for air quality impacts to European sites requires that all such sites within 15 km of the emissions source are considered. The following sites are within 15 km of the Main Site:
- Northumbria Coast SPA/ Ramsar site (14.6 km);
 - Durham Coast Special Area of Conservation (SAC) (14.6 km); and
 - North York Moors SAC/ SPA/ National Park (11.5 km).
- 6.72 There are five sites of special scientific interest (SSSI) within 5 km of the indicative DCO site boundary; the South Gare and Coatham Sands SSSI underpins the Teesmouth and Cleveland Coast SPA/ Ramsar site designation and, to the north/ east of the indicative site boundary, small areas extend to the boundary of the SSI site.

Ecological Surveys and Data Collection

- 6.73 Data has been collated to inform this Scoping Report, as described above. An Extended Phase 1 Habitat survey of the Proposed Development was undertaken in order to establish more detail regarding the baseline conditions and the requirements for further, more detailed ecological survey works. Third party data was obtained to further inform the scope of the Phase 2 surveys and the Ecological Impact Assessment (EclA), provided from the following sources:
- Environmental Records Centre North East (ERIC) – biological records for all taxa, habitats and designated sites; and
 - British Trust for Ornithology (BTO) Wetland Birds Survey (WeBS) – specialist ornithological records of wetland birds gathered during regular organised counts across coastal count areas (termed “sectors”) in the immediate vicinity of the Proposed Development.
- 6.74 The scope of the ecology surveys has been developed in consultation with Natural England, based on the consideration of potential impacts arising from terrestrial elements of the Proposed Development, including the CO₂ export corridor up to Mean Low Water (MLW) at Coatham Sands. The DCO application for the Proposed Development does not include any marine works beyond MLW (consent for the off-shore elements will be sought separately). Coastal bird surveys have been included on the basis that SPA/ pSPA/ Ramsar species and SSSI species may use both terrestrial and intertidal habitats.
- 6.75 Following a high level walkover survey undertaken by an ecologist in June 2017, an initial assessment of the likely potential scope of ecological surveys which would be required to support the EclA was determined. The initial survey was followed up by a more detailed Extended Phase 1 Habitat Survey undertaken on 21-22 February 2018, the results of which were used to refine the need for and scope of a number of additional baseline (Phase 2) surveys, including:

- Otter and water vole surveys – surveys were undertaken for both species in September 2018. The surveys covered the River Fleet, Railway Channel, the Mill Race, Steelhouse Pond and the Power Station Pond in the adjacent to proposed power station, gas and electricity connections
- Bat surveys – assessments of the roost potential of appropriate features and subsequent bat activity surveys were undertaken in August and September 2018 within and adjacent to habitats which could be impacted by the Proposed Development. Surveys were undertaken in accordance with the '*Bat Surveys for Professional Ecologists: Good Practice Guidelines*' (Collins, 2016)
- Reptile surveys – Surveys were carried out between 8th August and 9th October 2018, during which time artificial refugia placed strategically across the footprint of the proposed development were checked seven times at approximately regular intervals. in accordance with standard guidance (Froglife, 1999; Gent and Gibson, 2003; and Natural England, 2011).
- Phase 2 botanical surveys of complex or sensitive habitat types were carried out in May 2018. The remit of the survey included inspection of Plots within the SSI, Teardrop and Steel House areas to determine the relevant botanical interest features and associated plant species; and a general walk-over of all habitats to validate and supplement the Phase 1 Habitat survey data gathered in February 2018. The botanical surveys focused on the following key areas: the SSI and Teardrop plots; the Fleet River between the minor road (NZ575244) and southwest at the channel's terminus at NZ568235; a number of; and the habitats within the ornamental gardens immediately surrounding the Steel House Pond.
- Great crested newt surveys – eDNA Survey for GCN was carried out on 18th May 2018. Water samples were taken from each of the four ponds within the SSI Site, Teardrop and Steel House areas of the site and sent to Nature Metrics Ltd for analysis in accordance with approved field and laboratory protocols (Briggs *et al.*, 2014) The presence or absence of great crested newt from each of the surveyed waterbodies was determined based on the results of the eDNA analysis and thus the requirement for additional surveys was determined using this initial assessment. The analyses for each water body were negative.
- Terrestrial invertebrate surveys – The Main Site and Corridors include habitats (e.g. brownfield mosaic habitats) which suitable for invertebrates. Furthermore the the sand dune systems to the north of the study site, abutting the steelworks themselves, but separate from the survey area were formally designated as part of the South Gare and Coatham Sands Site of Special Scientific Interest (SSSI) in part for their invertebrate interest. An initial site scoping visit was conducted in May 2018, following which three further survey visits were conducted in June and July during which the terrestrial invertebrate assemblages were sampled using a variety of standard survey techniques as per Drake *et al.* (2007).
- Breeding Bird Surveys – Five survey visits were conducted between April and July (inclusive) 2018 following a Common Birds Census (CBC) protocol for field recording (Marchant, 1983; Gilbert *et al.*, 1998). Surveys were carried out in the following key areas of suitable habitat adjacent to the proposed development: SSI and Teardrop; Steelhouse pond and gardens; Coatham Sands; Lackenby substation and Saltholme substation.

- 6.76 In addition to the above, wintering / passage bird surveys were undertaken basis using an adapted WeBS count methodology on a monthly basis over a full 12 month period between and including September 2017 and August 2018. Surveys covered Coatham Sands and the adjacent sand dune system, Coatham Marsh; Redcar Steelworks, the Teardrop and semi-natural habitats immediately adjacent to it such that all habitats potentially attractive to wetland birds within a minimum of 500 m of the Main Site and connection corridors were covered.
- 6.77 The specific scope and extent of the Phase 2 surveys took into account the layout/ location of the Proposed Development as well as the proposed construction methods which may be employed and the land take required for such work. Survey work was undertaken on all land within the Zone of Influence of the proposed works.
- 6.78 The Applicant will consult with RCBC and Natural England regarding the results of the Extended Phase 1 Habitat survey. The need and nature of further ecological survey work will be agreed during this consultation.
- 6.79 The results of these surveys will inform the evaluation of the Proposed Development for ecological receptors and support a robust baseline to support the EclA, within which opportunities for ecological mitigation and enhancement will be explored fully.
- 6.80 In August 2017, Natural England was consulted regarding the potential scope of ecological survey likely to be required to inform the EIA/EclA. Once the results of the survey works have been interpreted and assessed, further consultation will be sought with RCBC and Natural England on: the scope and initial findings of ecological work being conducted; the possible significant impacts; and, as appropriate, measures for impact avoidance and/ or mitigation.

Ecological Impact Assessment Methodology

- 6.81 The EclA will be undertaken in accordance with the '*Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater and Coastal*' (CIEEM, 2nd edition January 2016) (the 'CIEEM Guidelines'). This guidance sets out the process of identifying the value of ecological receptors, characterising effects upon them and assessing whether these effects are significant. The EclA will also be undertaken in accordance with BS42020:2013 Biodiversity – Code of practice for planning and development (BSI, 2013).
- 6.82 This guidance follows a 'biodiversity' approach to impact assessment (rather than solely relying on the legal protection of a habitat or species to characterise ecological value other factors such as local abundance and rarity are also considered).
- 6.83 Although the new guidelines do not advocate a matrix style approach to assessment this methodology has been based on a hybrid approach which utilises matrices where they will be useful in providing certainty to the means by which valuations have been made. For a complex project such as the proposed scheme at this site this was judged to be the most appropriate approach. The assessment method uses a process of assigning ecological values to the identified ecological receptors, predicting and characterising potential ecological impacts and mitigation measures and, through this process, determining the significance of residual effects on ecological receptors.
- 6.84 Any likely significant adverse effects will be mitigated or compensated for and a number of ecological enhancements will also be recommended where appropriate, in accordance with relevant NPS. Following the implementation of mitigation and compensation, any residual effects on ecological receptors will be identified.

- 6.85 The results of the surveys, the desk study, consultation responses and the Extended Phase 1 Habitat survey will be used to undertake an ecological impact assessment. Once the ecological baseline for the Proposed Development has been fully described, any ecological receptors that are likely to be significantly impacted by the Proposed Development will be identified and appropriate and proportionate mitigation will be described where necessary. Mitigation and enhancement proposals will consider wider strategic aims and options for mitigation of development in the South Tees/ Redcar and Cleveland area.

Habitats Regulations Assessment

- 6.86 Given the proximity of the Teesmouth and Cleveland Coast SPA/ pSPA/ Ramsar site to the Proposed Development, a signposting report to inform a Habitats Regulations Assessment (HRA) will be undertaken and informed by the EclA. It is likely that an assessment under the Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations) will be required.
- 6.87 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.
- 6.88 The relevant matrices from the PINS '*Advice Note Ten: Habitat Regulations Assessment relevant to Nationally Significant Infrastructure Projects*' (2017) will be completed.

Scope of the Assessment

- 6.89 The following potential impacts may be associated with the Proposed Development:
- permanent loss of habitats during construction;
 - disturbance of ecological receptors (including noise, dust and light impacts) during construction, operation and decommissioning;
 - temporary impacts on habitats during construction of the connections to the high-pressure gas transmission network, the NETS, the CO₂ gathering network pipeline(s) and the CO₂ transport pipeline;
 - temporary and permanent impacts on aquatic habitats and water quality in the River Tees and/ or the North Sea (as appropriate) due to construction works at the abstraction and outfall points; and
 - air quality and deposition impacts on ecological receptors during operation.
- 6.90 Potential impacts on ecological receptors will be assessed using the Institute for Ecology and Environmental Management (IEEM) Ecological Impact Assessment Guidelines (2006) (IEEM, 2006). For the assessment of the potential deposition impacts, the assessment will be undertaken in accordance with the Environment Agency '*AQTAG 06 - Technical Guidance on detailed modelling approach for an appropriate assessment for emissions to air*' (2010) and the associated methodologies/ tools provided by APIS.
- 6.91 Any likely significant adverse effects will be mitigated or compensated for and a number of ecological enhancements will also be recommended where appropriate, in accordance with relevant NPS. Following the implementation of mitigation and compensation, any residual effects on ecological receptors will be identified.

- 6.92 The results of the surveys, the desk study, consultation responses and the Extended Phase 1 Habitat survey will be used to undertake an ecological impact assessment. Once the ecological baseline for the Proposed Development has been fully described, any ecological receptors that are likely to be significantly impacted by the Proposed Development will be identified and appropriate and proportionate mitigation will be described where necessary. Mitigation and enhancement proposals will consider wider strategic aims and options for mitigation of development in the South Tees/ Redcar and Cleveland area.

Traffic & Transportation

Baseline Conditions

- 6.93 The main route to the site will be via existing access roads from the A1085 trunk road between Redcar and the A1053 Tees Dock Road, north of Grangetown and approximately 4 km south of the SSI site. From here, the A19 will be accessed from either the A66, passing north of Middlesbrough, or the A174, passing to the south.
- 6.94 There are no PRowWs crossing or adjacent to the SSI site therefore development of the generating station and capture plant will have no impact on PRowWs. The following PRowWs are located to the south of the Bran Sands Sewage Treatment Plant:
- Bridleway 116/9;
 - Footpath 116/31;
 - Footpath 102/2; and
 - Footpath 102/2A.
- 6.95 These PRowWs may be affected by the final routes of the connections to the high-pressure gas transmission network and the NETS, together with the route(s) for the CO₂ gathering network pipeline(s).
- 6.96 The proposed Electrical Connection corridors cross the Tees Valley Railway Line. The gas connection and the CO₂ gathering network pipeline(s) are currently not expected to require the crossing of this line, however industry service rail lines may require crossing.
- 6.97 Consultation will be undertaken with Network Rail and Northern Rail (and other rail operators as appropriate) regarding the potential crossings of rail lines by either of the gas or electrical connections.

Scope of the Assessment

- 6.98 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;
 - generation of traffic during operation affecting the local and strategic road network; and
 - construction of gas pipeline, electrical grid connection and the CO₂ gathering network pipeline(s) affecting road and rail links and PRowWs.
- 6.99 A preliminary assessment has been undertaken to establish the level of traffic that is likely to be associated with the Proposed Development.

- 6.100 During the operational phase of the development, it is anticipated that there will be a work-force of approximately 100 people 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. Fuel will be delivered by pipeline and other operational and maintenance consumables will be managed to be kept as low as is reasonably practicable. Therefore, it is considered that the effects of operational traffic would be negligible and a detailed assessment of the operational phase of the development is not proposed for the ES.
- 6.101 The principal vehicle movements are anticipated to be associated with the construction phase of the development. The volume of construction vehicles associated with the delivery of plant and the labour force has not been determined at this stage, but based on other similar sized CCGT power station construction projects is likely to be between 600 and 1200 two-way vehicle movements per day during the peak construction period. It is expected that construction works would be staged such that work on successive CCGT trains would be separated by perhaps 6 months or more. As such, the above peak may be expected to occur three times over the total construction period.
- 6.102 To fully address the impacts of the construction phase on the transport network, a Transport Assessment (TA) will be produced (though this will be confirmed following determination of the number of construction movements, in liaison with RCBC⁴, as the highways authority, and Highway England). The scope for the TA will follow the guidelines set out in the Planning Practice Guidance for '*Travel Plans, Transport Assessments and Statements*' (2014). RCBC and Highways England will be consulted so that their specific requirements can be accommodated within the TA scope.
- 6.103 The traffic and transport chapter in the ES will summarise the salient points from the TA. It will also relate the magnitude and significance of potential impacts to criteria contained in the IEMA '*Guidelines for the Environmental Assessment of Road Traffic*' (1993) and the DMRB Volume 11 '*Environmental Assessment*'.
- 6.104 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;
 - 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 abnormal loads such as the delivery of generators and transformers;
 - 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 for leisure and commuting uses, and whether their use would be affected by the Proposed Development;

⁴ Traffic generation within the jurisdiction of STBC is not anticipated to be such that a TA would be required; for development within Stockton on Tees, a Transport Statement will be prepared.

- construction of gas pipeline and electrical grid connection affecting road and rail links;
 - cumulative impact assessment – including consideration of the traffic likely to be generated by any decommissioning and demolition of existing infrastructure within the SSI site, which is likely to be concurrent with the Proposed Development construction phase; and
 - the formulation of mitigation measures, such as a Construction Worker Travel Plan 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 to seek to control the routing and impact that HGVs will have on the local road network during construction.
- 6.105 Consultation with RCBC and Highways England 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.
- 6.106 As described earlier, it is considered that traffic and transport impacts are more likely to occur during the construction phase of the development. 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.

Landscape & Visual Amenity

Baseline Conditions

- 6.107 The Tees Lowlands National Character Area (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. Ecological European designated sites 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. Industrial installations form a dramatic skyline when viewed from the surrounding hills.
- 6.108 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees however, the RCBC '*Landscape Character Supplementary Planning Document*' (March 2010) notes that this industry has a strong influence on neighbouring landscape character areas.
- 6.109 Immediately north of the SSI 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."

Scope of the Assessment

- 6.110 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 during construction and decommissioning; and

- permanent changes to landscape character and views from sensitive receptors in the vicinity of the Proposed Development during operation.
- 6.111 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*’ (IEMA, 2013, “GLVIA3”);
 - ‘*An Approach to Landscape Character Assessment*’ (Natural England, 2014); and
 - ‘*Photography and photomontage in landscape and visual impact assessment*’ (Landscape Institute, Advice Note 01/11, 2011).
- 6.112 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.
- 6.113 The assessment of impacts on built heritage, including impacts on the setting of listed buildings and structures, will be addressed by the archaeology and cultural heritage assessment.
- 6.114 A detailed study of the existing landscape components, character and views of the site and an identified study area will be carried out in consideration of the following:
- site context (including industrial heritage);
 - topography;
 - vegetation including green infrastructure;
 - roads, public rights of way and access;
 - settlement and land-use;
 - landscape character; and
 - representative views.
- 6.115 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.
- 6.116 Up to ten representative views will be identified within the Zone of Theoretical Visibility (ZTV) for the main building envelope and the potential stacks and absorber columns, as well as around the AGI for the gas connection. 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 site;

- topography and elevation;
 - degree and period of exposure;
 - designation of the viewing place; and
 - distribution of receptors.
- 6.117 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 site. Technical details regarding the height of the tallest elements of the Proposed Development will then enable the definition of a study area within which landscape or visual impacts have the potential to be significant.
- 6.118 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.
- 6.119 The location of representative views and photomontages will be agreed in consultation with RCBC, STBC and other key stakeholders.
- 6.120 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.

Archaeology & Cultural heritage

Baseline Conditions

- 6.121 There are no scheduled ancient monuments that are likely to be affected by the construction and operation of the Proposed Development. The nearest monument is the 'Eston nab hill fort' approximately 800 m south of Lackenby (where the 275 kV substation that is currently considered as the connection point to the NETS).
- 6.122 There are ten grade II listed buildings within 2 km of the SSI site. The Marsh Farm House and Cottages comprise three listings approximately 500 m to the east of the SSI site. The South Gare Lighthouse is approximately 2 km north of the SSI site. The remainder of the listings are located at Dormanstown and to the west of Redcar.
- 6.123 More detail regarding the baseline conditions, such as non-designated heritage assets, will be determine through consultation with RCBC, including the Redcar and Cleveland HER, and supplemented by a site visit.

Scope of the Assessment

- 6.124 The following potential impacts may be associated with the Proposed Development:
- physical impacts and/ or impacts on the setting on non-designated heritage assets, including historic landscape character areas, within the main site and along the gas connection during construction; and
 - impacts on the setting of designated and non-designated heritage assets, including historic landscape character areas, in the vicinity of the main site and along the gas connection during construction and operation.

- 6.125 A desk-based archaeological assessment will determine, as far as is reasonably possible from existing records (including the Redcar and Cleveland Historic Environment Records (HER), Historic England Archive and the National Heritage List) and visits to relevant archives and local studies libraries, the nature of the archaeological resource within a study area of 1 km for non-designated assets. A larger study area of 5 km, or larger if appropriate, will be used to identify designated heritage assets and the results will be used to identify any impacts that the Proposed Development may have on the receptors. An inventory of all heritage assets will be cross-referenced to drawings (base maps) and the report narrative. This baseline collation of data will be supported by site visits to identify any unknown archaeological assets, the potential for survival of archaeology and to establish the setting of identified archaeological assets.
- 6.126 Due to the scale of the Proposed Development there is the potential for the setting of these heritage assets to be impacted; therefore potential setting impacts upon designated and non-designated assets will be assessed. The ZTV (to be undertaken as part of the landscape and visual impact assessment as discussed in Section 6.7) will be used as a tool of assessment to identify areas of visibility, however as the setting of a heritage asset is not a solely visual concept, other aspects such as aural intrusion and historical associations must also be taken into account. The assessment will follow current professional good practice and guidance including that produced by the Chartered Institute for Archaeologists (CIfA) and Historic England (HE) (formerly English Heritage (EH)):
- *'Standard and Guidance for historic environment desk-based assessment'* (CIfA, 2014);
 - *'Conservation Principles: Policies and Guidance for the Sustainable Management of the Historic Environment'* (EH, 2008);
 - *'Seeing History in the view'* (EH, 2011);
 - *'Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment'* (HE, 2015);
 - *'Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets'* (HE, 2015); and
 - *'Historic England Advice Note 4: Tall Buildings'* (HE, 2015).
- 6.127 It is expected that sufficient heritage information is presently available to provide an adequate baseline assessment for the EIA. Further archaeological evaluation such as geophysical survey is not anticipated, but this will be discussed and agreed with RCBC.
- 6.128 The purpose of the EIA will be to assess the potential impacts of the Proposed Development upon the significance of the heritage resource and to understand the level of harm to that resource. The aim will then be to propose appropriate mitigation to resolve the harm caused, where possible.
- 6.129 Once all of the potential heritage receptors have been identified, they will be assigned a 'value'. This is not solely a reflection of their designated or non-designated status but is determined through a number of factors including their values which can be expressed as artistic, archaeological, architectural or historic. The impact from the Proposed Development upon the significance of the heritage assets will then be quantified and expressed within the EIA. This will produce an initial significance of effect of the Proposed Development upon the heritage resource, taking into account any design or embedded mitigation.

- 6.130 Following the impact assessment process, any potential mitigation strategies required will be considered and recommendations made. The significance of residual effects remaining after mitigation will be assessed according to accepted criteria for assessing heritage assets.

Socio-economics & Tourism

Baseline Conditions

- 6.131 The Main Site is within the SSI site that has, historically, been used for coking and iron-making. In October 2015, SSI, who previously owned and operated the site, went into liquidation. As a result, the SSI site was amongst a number of local sites closed, resulting in a significant negative impact on the local economy.

- 6.132 The RCBC Core Strategy (see Section 0) states:

“The steel industry also remains important to the local economy, despite its decline over recent years, employing 3,000 people directly and 14,000 indirectly.”

- 6.133 The liquidation of SSI brought to an end 170 years of iron and steel making on Teesside.

- 6.134 The Local Plan states:

“The traditional employment base of Redcar and Cleveland has been manufacturing based on steel, chemicals and heavy engineering. However, over recent decades, there has been a decline in these industries which has impacted upon many communities in the borough and the north east, resulting in areas of urban deprivation and a declining population. The chemical industry, mainly based at Wilton International, is a vitally important part of the local, regional and national economy.”

Scope of the Assessment

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

- creation of direct and indirect employment during construction, operation and decommissioning;
- temporary disruption to traffic on the local and strategic road networks during construction;
- temporary disruption to PRowS within the areas envisaged for the connections to the high-pressure gas transmission network and the NETS during construction; and
- nuisance and health and safety.

- 6.136 Potential traffic, noise, air quality/ dust and visual impacts on residential and other sensitive receptors will be assessed as part of the traffic and transport, noise and vibration, air quality, and landscape and visual amenity assessments described above.

- 6.137 The methodology for assessing land use and socio-economic impacts will follow standard EIA guidance and will involve:

- review of relevant baseline conditions across the land to be used by the Proposed Development, including its utilities connections, and locality;

- assessment of socio-economic policy justification for the Proposed Development and the contribution of these activities to the socio-economic policy objectives of RCBC, TVCA and STDC;
 - estimate of employment generated during the construction, operational and decommissioning phases;
 - assessment of the impact on local businesses, and PRowWs, that may be affected by the Proposed Development;
 - consideration will also be given to whether there are any impacts that are not assessed in other ES chapters that might affect recreational activities and land use in the immediate surrounds; and
 - assessment of the likely scale, permanence and significance of effects.
- 6.138 The social and economic policy context review will consider relevant policy local, regional and national levels. The assessment will be carried out using a number of recognised data sources including, but not limited to, the following:
- Office of National Statistics Labour Force and Neighbourhood Statistics;
 - Annual Business Inquiry;
 - Annual Population Survey;
 - Census 2011; and
 - Travel to Work Data.
- 6.139 The Applicant will consult with RCBC and other key stakeholders to determine the best sources for the data/ statistics that will be required for the assessment.
- 6.140 Wherever possible the impacts of the socio-economic assessment will be appraised against relevant national standards such as those provided by HM Treasury and Homes and Communities Agency (HCA). Where no standards exist, professional experience and judgement will be applied and justified.
- 6.141 A summary will be provided of key residual impacts of the Proposed Development and how the Proposed Development fits into local and regional socio-economic objectives, as well as its overall impact on the contribution to the local economy and community.

Population and Human Health

- 6.142 All of the previously discussed environmental aspects that are or are partially relevant to population and human health are proposed to be assessed against criteria that have been established for the protection of human health (e.g. air quality standards). Therefore, no specific human health impact assessment is proposed for the EIA.
- 6.143 The ES for the Proposed Development will draw on the assessments of environmental aspects where there is a potential for a significant impact on population and human health (e.g. air quality). A dedicated section will be provided to summarise the results of the assessment of each environmental aspect, as relevant in order to determine the potential overall (in-combination) impact to identified population and human health receptors.
- 6.144 The consultations undertaken in defining the methodology, identifying receptors, etc. for the assessment of each environmental aspect will include consideration of population and human health.

Cumulative Effects

- 6.145 A number of other proposed developments have already been identified in the vicinity of the Proposed Development that could potentially result in cumulative impacts during its construction and operation – these are listed below. However, consultation with RCBC will be undertaken in respect of identifying additional proposals and planning applications submitted under the Town and Country Planning Act 1990 that may also have the potential to produce significant cumulative environmental impacts.
- 6.146 An assessment of potentially significant cumulative effects with other proposed developments in the vicinity of the Proposed Development will be undertaken for each of the topics described above, and reported in the ES.
- 6.147 The Applicant will consult with RCBC and neighbouring local authorities in order to define the full list of current and future developments/ projects to be considered for the potential cumulative impacts.

Other Developments

Tees Combined Cycle Power Plant (CCPP)

- 6.148 A gas-fired CCGT generating station with a maximum generating capacity of up to 1,700 MW is proposed on approximately 15 ha of land formerly used as a gas-fired generating station within the southwest part of the Wilton International Complex.
- 6.149 The project will require a DCO to enable its construction and operation. PINS published its scoping opinion in April 2017 and formal consultations, under Section 42 of the PA2008, were undertaken between June - July 2017. The examination has closed and a decision is expected in April 2019.

York Potash Harbour Facilities

- 6.150 In July 2016, the Secretary of State 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).

Tees Renewable Energy Plant (REP)

- 6.151 The Tees REP will be a c.295 MW biomass-fired generating station to be located on the south bank of the River Tees within the PD Ports Teesport landholding.
- 6.152 Construction of the project commenced in August 2016 and is expected to be completed in 2019 with commercial operation commencing in early 2020.

7. Environmental Impact Assessment

EIA Methodology and Reporting

- 7.1 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.
- 7.2 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 the formal Scoping Report.
- 7.3 The EIA is based on a number of related activities, as follows:
- establishing existing baseline conditions;
 - consultation with statutory and non-statutory consultees throughout the DCO 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.
- 7.4 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 not significant).
- 7.5 Where likely significant environmental effects are identified in the assessment process, measures to mitigate these effects will be put forward in the form of recommendations to be undertaken as part of the project development.

Structure of the Environmental Statement

- 7.6 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 residual impacts.
- 7.7 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: Environmental Statement: This will contain the full text of the EIA with the proposed chapter headings as follows:
 1. Introduction;
 2. Assessment Methodology;
 3. Description of the Site;
 4. The Proposed Development;
 5. Construction Programme and Management;
 6. Design Evolution and Alternatives Assessment;
 7. Planning Policy Context;
 8. Air Quality and Climate;
 9. Hydrology and Water Resources;
 10. Geology and Hydrogeology;
 11. Noise and Vibration;
 12. Ecology and Nature Conservation;
 13. Traffic and Transportation;
 14. Landscape and Visual Amenity;
 15. Archaeology and Cultural Heritage;
 16. Socio-economics and Tourism;
 17. Population and Human Health; and
 18. Cumulative and Combined Effects;
 19. Summary of Significant Residual Effects.
- Volume II: Figures.
- Volume III: Technical Appendices: these will provide supplementary details of the environmental studies conducted during the EIA including relevant data tables, figures and photographs. This will include the CHP Assessment, FRA and other technical reports. A table outlining the proposed mitigation measures and how they are to be secured will also be provided.

Structure of Technical Chapters

7.8 Chapters 8 - 18 will be structured based on the following sub-headings:

Introduction

7.9 The Introduction will describe the format of the assessment presented within the chapter.

Legislation and Planning Policy Context

7.10 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.

Assessment Methodology and Significance Criteria

- 7.11 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. Design Manual for Roads and Bridges and Institute of Environmental Management & Assessment guidelines) and relevant significance criteria.
- 7.12 The significance of effects before and after mitigation 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.
- 7.13 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.
- 7.14 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;
 - sensitivity of these receptors; and
 - duration of the impact.
- 7.15 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:
- 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.

- 7.16 As indicated above, for the purpose of this EIA moderate and major effects will be deemed 'significant', and where possible mitigation measures will be identified to reduce the residual effects to 'not significant'.
- 7.17 Each of the technical chapters will provide the criteria, including sources and justifications, for quantifying the different levels of residual effect. Where possible, this has been based upon quantitative and accepted criteria (for example, the National Air Quality Strategy objectives or noise assessment guidelines), together with the use of value judgement and expert interpretation to establish to the scale of an effect.

Baseline Conditions

- 7.18 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.
- 7.19 '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. In particular, consideration will be given to the potential for the demolition of the existing infrastructure within the SSI site, and how this would alter the existing baseline conditions during construction and operation of the Proposed Development.
- 7.20 For the purposes of assessment, each chapter will identify a reasonable 'worst case scenario' with regards the decommissioning and demolition project, for example the Traffic and Transport assessment will assume the peak of demolition traffic will coincide with the peak of construction traffic.

Development Design and Impact Avoidance

- 7.21 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 Construction and Operational Environmental Management Plans, and adherence of relevant legislation, guidance and best practice. The assessment of impacts and effects in the next section takes account of these measures already being in place.

Likely Impacts and Effects

- 7.22 This section will identify the likely impacts resulting from the Proposed Development. The magnitude of impacts are 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

- 7.23 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.

Residual Effects and Conclusions

- 7.24 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.

Cumulative and Combined Effects

- 7.25 In accordance with the EIA Regulations, consideration will also be given to the potential for cumulative impacts to arise.
- 7.26 Cumulative impacts are those that accrue over time and space from a number of development activities. The impact of the Proposed Development will be considered in conjunction with the potential impacts from other projects or activities which are both reasonably foreseeable in terms of delivery (e.g. have planning consent) and are located within a realistic geographical scope where environmental impacts could act together to create a more significant overall effect.
- 7.27 Combined effects will also be assessed. The combination of predicted environmental impacts resulting from a single development on any one receptor that may collectively cause a greater effect (such as the combined effects of noise and air quality/ dust impacts during construction on local residents), are referred to as combined effects.

Scoping and Consultation

- 7.28 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 project design thereby limiting adverse effects and enhancing environmental benefits.
- 7.29 Due to current uncertainties relating to the specific design of the Proposed Development, this document is not to be considered as a formal request for a scoping opinion, nor as part of any of the additional formal consultation stages required by the PA2008 and associated regulations. This document has been prepared to outline the basis on which it is anticipated that a formal request for a scoping opinion will be made to PINS. Upon receipt of the formal request for a scoping opinion, PINS will, in accordance with Regulation 10(6) of the EIA Regulations, contact all relevant consultation bodies prescribed by the PA2008 and associated regulations directly in order to seek their formal views on what should be included in its scoping opinion.
- 7.30 As required by Section 47 of the Planning Act 2008 (as amended) the Applicant will prepare 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 format and content of the SoCC will be discussed and agreed with RCBC prior to publication. Consultation will use a range of methods including public exhibitions and ongoing use of the project website.
- 7.31 Preliminary Environmental Information (PEI) will be provided for statutory consultation. As for the non-statutory consultation, this will use a range of methods including public exhibitions and ongoing use of the project website.
- 7.32 All responses received during consultation will be carefully considered and taken into account in the development of the project, 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. This Consultation Report will be submitted with the DCO application to the PINS and will be available for public review at that point.

- 7.33 The Consultation Report will demonstrate how the Applicant has reviewed and considered all representations and consultations received regarding the Proposed Development. The Consultation Report will be reviewed by PINS, both when determining whether to accept the application, and then during its examination.

8. Summary

- 8.1 This Request for a Scoping Opinion has identified the potential for significant effects to arise from the construction and operation of the Proposed Development. The following specialist assessments for inclusion in the EIA are proposed:
- Air Quality and Climate;
 - Hydrology and Water Resources;
 - Geology and Hydrogeology;
 - Noise and Vibration;
 - Ecology and Nature Conservation;
 - Traffic and Transportation;
 - Landscape and Visual Amenity;
 - Archaeology and Cultural Heritage; and
 - Socio-economics and Tourism.
- 8.2 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.
- 8.3 In addition, the ES for the Proposed Development will draw on the above assessments where there is a potential for a significant impact on population and human health (e.g. air quality). A dedicated section will be provided to summarise the relevant results in order to determine the potential overall (in-combination) impact to identified population and human health receptors.

Items Proposed for Scoping Out of EIA

Major Accidents or Disaster Vulnerability

- 8.4 An application to the Environment Agency for an environmental permit will be required, in accordance with the EPR, in order to allow for the operation of the Proposed Development.
- 8.5 Applications for an environmental permit require an environmental risk assessment (ERA) to be undertaken in order to consider the potential environmental risks from the operation of a project, including:
- any discharge, for example sewage or trade effluent to surface or groundwater;
 - accidents;
 - odour;
 - noise and vibration;
 - uncontrolled or unintended ('fugitive') emissions; and
 - visible emissions, for example smoke or visible plumes.

8.6 The Environment Agency '*Risk assessments for your environmental permit*' (February 2016) provides further guidance regarding the identification of accidents and the scope of the ERA:

"Examples of possible accidents include:

- *transferring substances, for example loading or unloading vessels*
- *overfilling vessels*
- *plant or equipment failure, for example over pressurised vessels and pipework, blocked drains, fire and contaminated water used to fight the fire escaping into the local watercourse or ground*
- *releasing an effluent before checking its composition*
- *vandalism*
- *flooding*
- *inadequate bunding around tanks*

There could also be a risk of accidents related to your specific industry."

8.7 In addition, it is likely that the amounts of process chemicals/ substances that may be stored on-site will trigger the need for the Proposed Development to accord with the Control of Major Accident Hazards Regulations 2015 (COMAH) for which, depending upon the nature of the potential hazard, the following documents may be required:

- Major accident prevention policy (MAPP); and/ or
- Safety Report.

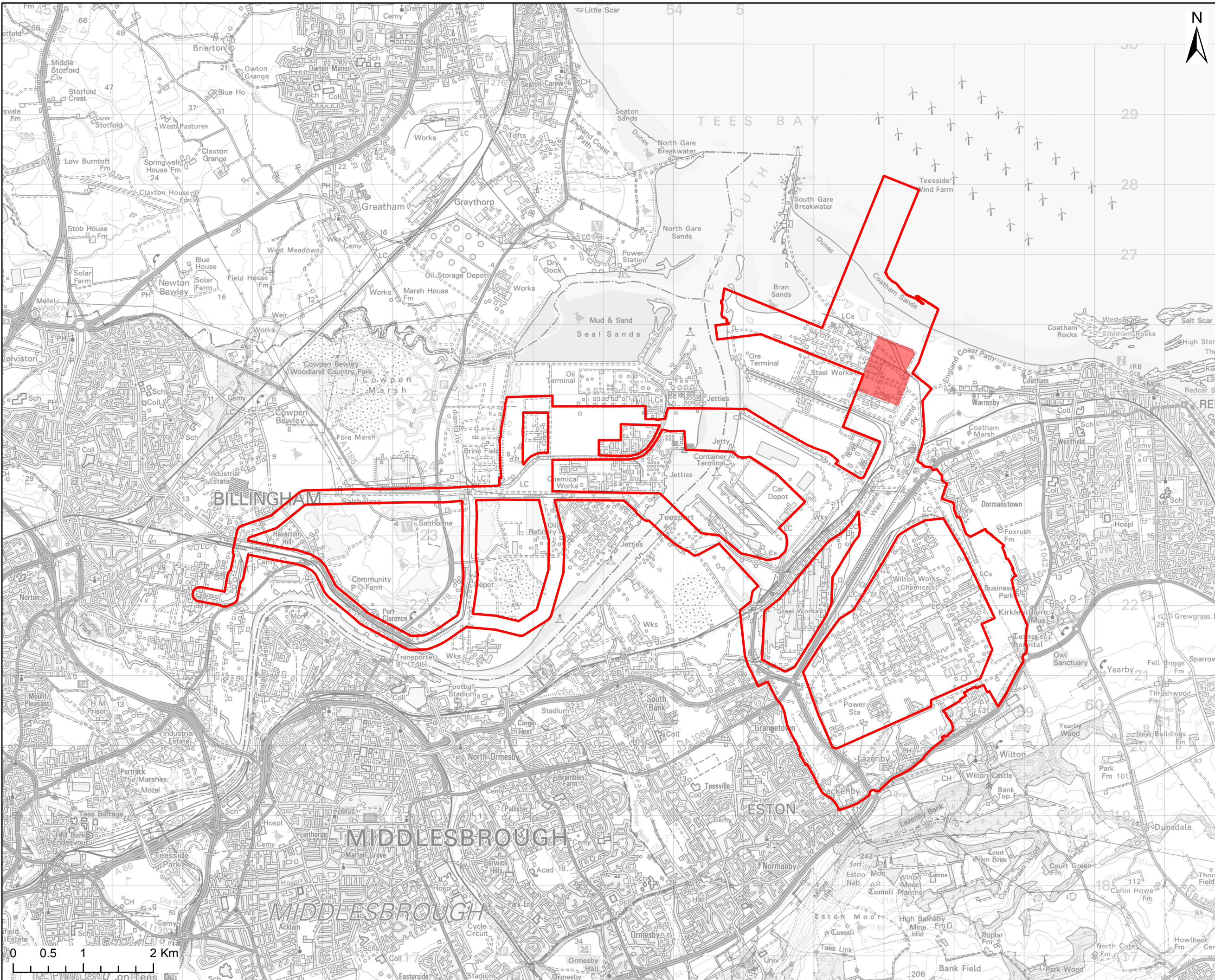
8.8 A MAPP is, by legislation, required to include details of the operator's policy regarding the aims and principles that are implemented to prevent major accidents at a site and a description of the safety management system that will be used to deliver these. Current HSE guidance on the content of a MAPP is that it should include:

- roles and responsibilities of personnel at all levels involved in the management of the major hazards
- arrangements for selecting personnel and providing training to ensure they are competent to work with a major hazard
- hazard identification and risk assessment
- procedures and instructions for safe operation
- design and modifications of installations
- identification of foreseeable emergencies and the preparation, test and review of emergency procedures
- measuring compliance
- review and audit

8.9 A safety report is required for higher risk ("upper tier") sites which builds on the provisions of the MAPP. A safety report will require assessment and acceptance by the HSE, as the competent authority for COMAH.

- 8.10 In light of the above, it is considered that the risks of major accidents are suitably assessed, regulated and controlled by other legislative frameworks, therefore, the assessment of major accidents is not proposed for specific assessment within the EIA. However, accidental events such as the potential for fuel spillages and abnormal air emissions, and how the risk of these events will be minimised, will be discussed in the relevant chapters of the ES. Accidental events will be covered by a brief risk assessment in the ES, which will include reference to the applicant's overarching principles of emergency management.

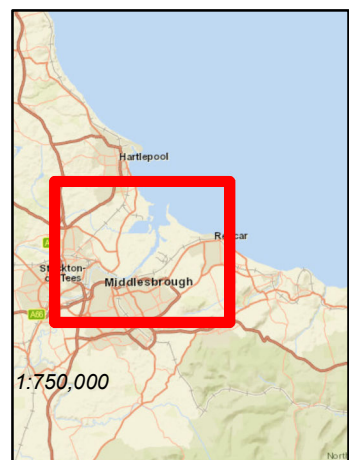
Appendix A – Figures



Project Title:
 TEESIDE CLUSTER
 CARBON CAPTURE &
 USAGE PROJECT

Client:
 OGCi CLIMATE
 INVESTMENTS
 HOLDINGS LLP

Location Inset:



LEGEND

- DCO Application Boundary
- Main Site (Generating Station including CO2 capture and CCUS booster station)

Copyright:

Source: © Crown copyright and database rights 2017
 Ordnance Survey 0100031673
 Projection: British National Grid

AECOM Internal Project No:

60559231

Drawing Title:

DCO APPLICATION BOUNDARY

Scale at A3: 1:50,000

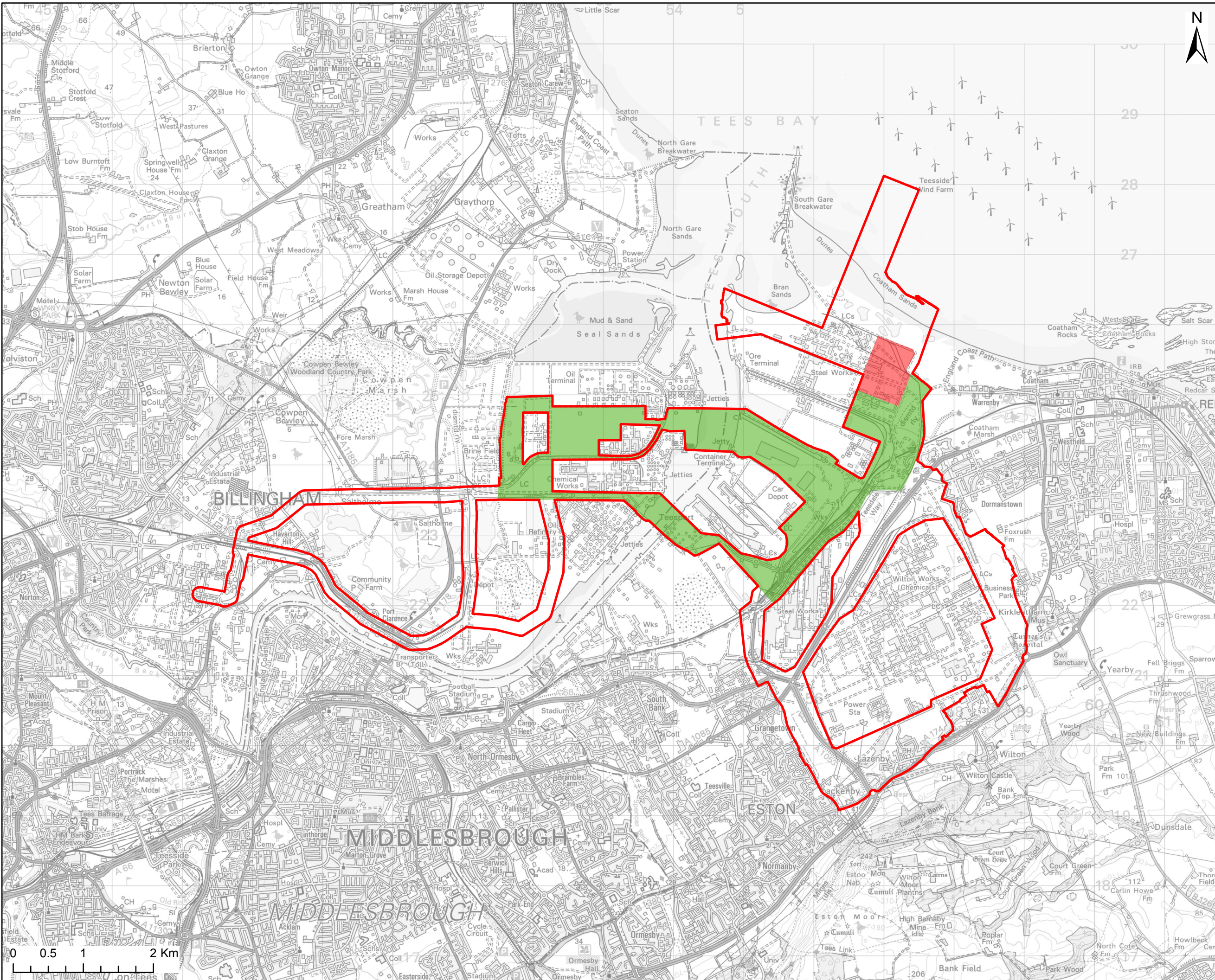
Drawing No: **Rev:**

FIGURE 1 03

Drawn: Chk'd: App'd: **Date:**

RT RT RL 13/02/19

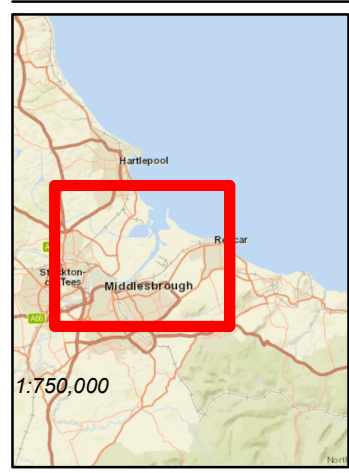
This drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the stated dimensions.



Project Title:
 TEESIDE CLUSTER
 CARBON CAPTURE &
 USAGE PROJECT

Client:
 OGCi CLIMATE
 INVESTMENTS
 HOLDINGS LLP

Location Inset:



LEGEND

- DCO Application Boundary
- The Main Site
- Gas Connection Corridors

Copyright:

Source: © Crown copyright and
 database rights 2017
 Ordnance Survey 0100031673
 Projection: British National Grid

AECOM Internal Project No:

60559231

Drawing Title:

**GAS CONNECTION
 CORRIDORS**

Scale at A3: 1:50,000

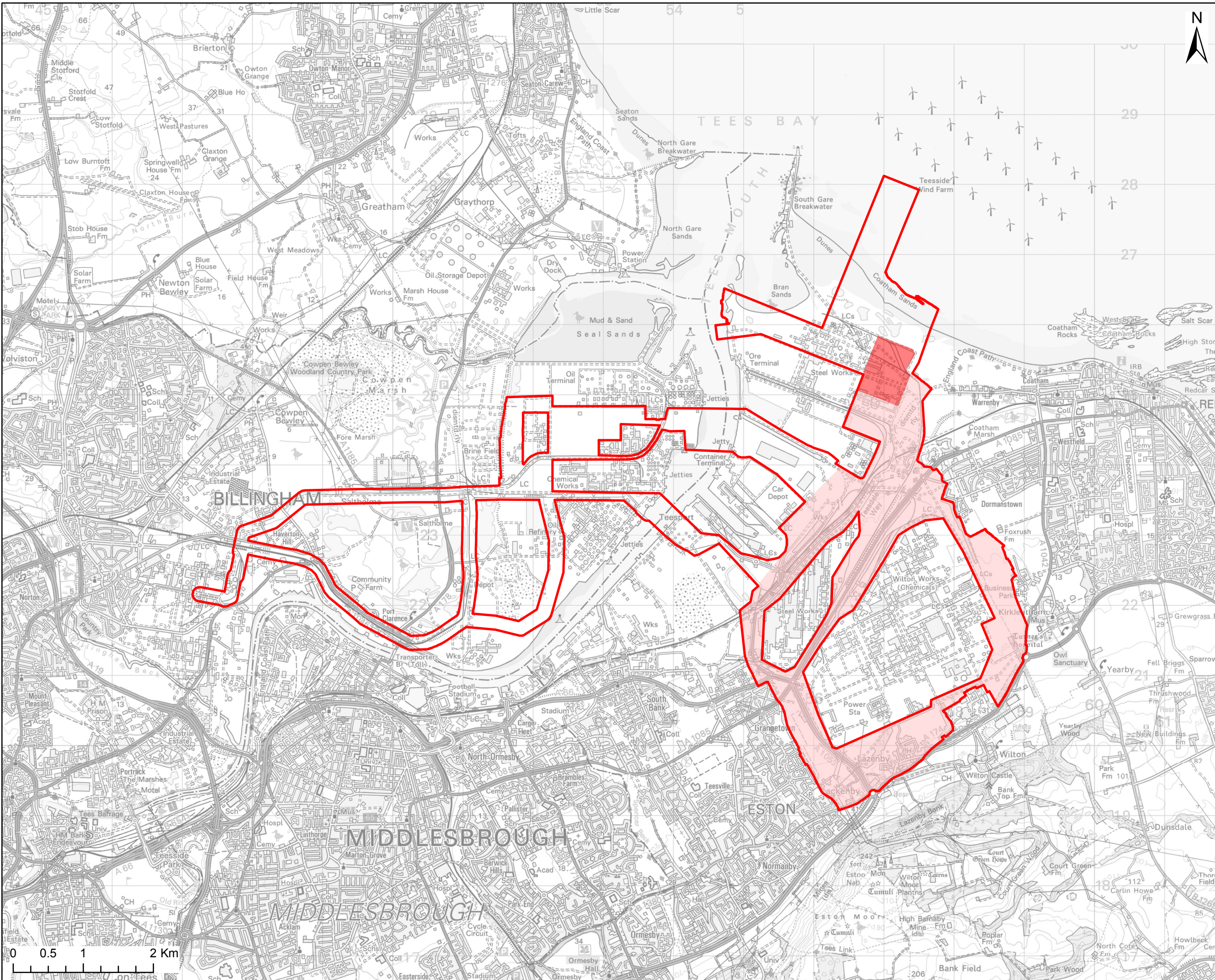
Drawing No: **Rev:**

FIGURE 2 01

Drawn: Chk'd: App'd: Date:

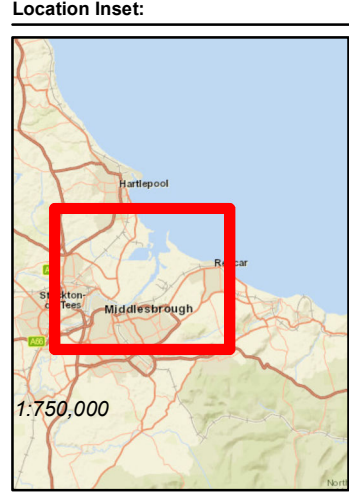
RT RT RL 13/02/19

This drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the stated dimensions.



Project Title:
 TEESIDE CLUSTER
 CARBON CAPTURE &
 USAGE PROJECT

Client:
 OGCi CLIMATE
 INVESTMENTS
 HOLDINGS LLP



- LEGEND**
- DCO Application Boundary
 - The Main Site
 - Electrical Connection Corridors

Copyright:
 Source: © Crown copyright and
 database rights 2017
 Ordnance Survey 0100031673
 Projection: British National Grid

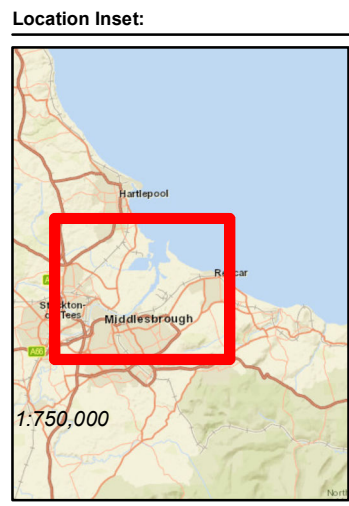
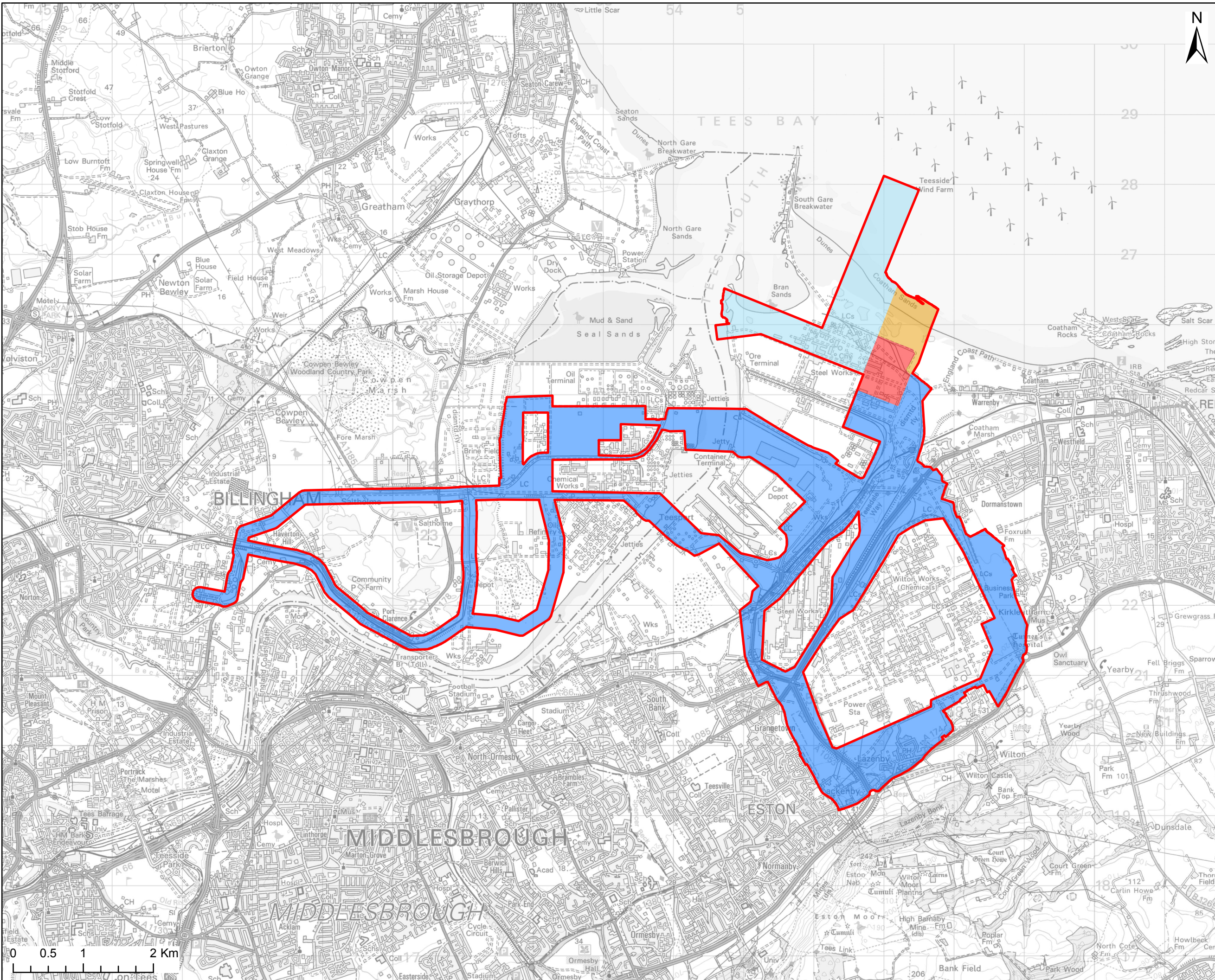
AECOM Internal Project No:
 60559231

Drawing Title:
 ELECTRICAL
 CONNECTION
 CORRIDORS

Scale at A3: 1:50,000
Drawing No: FIGURE 3
Rev: 01

Drawn: Chk'd: App'd: Date:
 RT RT RL 13/02/19

This drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the stated dimensions.



- LEGEND**
- DCO Application Boundary
 - The Main Site
 - Water Connection Corridors
 - Onshore CO2 Transport Corridor
 - CO2 Gathering Network Corridors

Copyright:
 Source: © Crown copyright and
 database rights 2017
 Ordnance Survey 0100031673
 Projection: British National Grid

AECOM Internal Project No:
 60559231

Drawing Title:
 WATER, ONSHORE CO2
 TRANSPORT AND CO2
 GATHERING NETWORK
 CORRIDORS
 Scale at A3: 1:50,000

Drawing No: FIGURE 4
Rev: 01

Drawn: Chk'd: App'd: Date:
 RT RT RL 13/02/19

This drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the stated dimensions.

AECOM Infrastructure & Environment UK Limited
5th Floor, 2 City Walk
Leeds LS11 9AR
United Kingdom

T: +44 (0)113 391 6800
aecom.com