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15. Ornithology

15.1 Introduction

15.1.1 This chapter of the Environmental Statement (ES) identifies the potential impacts to ornithology that are to be considered as part of the Environmental Impact Assessment (EIA) of the Proposed Development. The assessment has been undertaken in accordance with best practice guidance published by the Chartered Institute of Ecology and Environmental Management (the CIEEM guidance) (2019).

15.1.2 The purpose of this chapter is to assess the potential impacts and effects of the Proposed Development on all ornithological designations, populations of birds and bird species regardless of their habitat associations. The Proposed Development is sited predominantly onshore (i.e. within terrestrial habitats), however some elements of the Proposed Development are sited beneath, through or within estuarine habitats including intertidal habitat and some of the infrastructure extends a short distance offshore within the marine environment. Furthermore, some of the species of interest for which sites are designated forage offshore and this is reflected in the boundaries of some designated sites. This chapter therefore includes an assessment of the effects of the Proposed Development on the species identified as receptors, including within terrestrial and freshwater habitats, intertidal habitats and in some cases where habitats and species below Mean Low Water Springs (MLWS), on which the identified ornithological receptors rely, may be affected. The Proposed Development does not extend offshore far enough to affect species that are primarily pelagic (i.e. using open sea away well from the land), or sites designated for such species.

15.1.3 A detailed description of the Site, the Surrounding Area and the Proposed Development is provided in Chapter 3: Description of the Existing Environment, Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2) and the associated Figures 3-1 to 3-4 (ES Volume II, Document Ref. 6.3). Construction and Management details can be found in Chapter 5: Construction Programme and Management (ES Volume I, Document Ref. 6.2).

15.1.4 Potential impacts to marine water quality have been considered within Chapter 9: Surface Water, Flood Risk and Water Resources (ES Volume I, Document Ref. 6.2). Chapter 12: Terrestrial Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2), considers potential impacts to land-based ecological receptors but also considers linkages with wider receptors (such as ornithology). Chapter 13: Aquatic Ecology (ES Volume I, Document Ref. 6.2), considers impacts to freshwater ecological receptors including those within land-locked freshwaters and non-tidal freshwaters. Chapter 14: Marine Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2), considers impacts to marine ecology and fisheries.

15.1.5 This chapter addresses the potential temporary and permanent impacts of the Proposed Development on ornithology receptors.

15.1.6 This chapter is supported by the following technical appendices, provided in ES Volume III, Document Ref. 6.4:

- Appendix 12A: Legislation and Planning Policy Relevant to Ecology and Nature Conservation;
- Appendix 12B: Ecological Impact Assessment (EcIA) Methods;
- Appendix 12C: Preliminary Ecological Appraisal (PEA) Report;
- Appendix 12H: Supplementary Habitat Information Report for Coatham Sands;
- Appendix 15A: Baseline Ornithology Report; and
- Appendix 15B: Confidential Ornithology Baseline Report.

15.1.7 This chapter is also supported by the Habitats Regulations Assessment Report (Document Ref. 5.13).

15.2 Legislation and Planning Policy Context

Legislation

15.2.1 The following legislation is potentially relevant to the scope of this chapter:

- The Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations);
- Wildlife and Countryside Act 1981 (as amended) (the WCA);
- Countryside and Rights of Way (CRoW) Act 2000; and
- Natural Environment and Rural Communities (NERC) Act 2006.

15.2.2 European Union (EU) legislation as it applied to the UK on 31 December 2020 is now a part of UK domestic legislation as 'retained EU legislation'. Changes have been made to parts of the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 so that they effectively continue the legislation which implemented the EU Habitats and Species Directive and parts of the Wild Birds Directive. Most of these changes involve transferring functions from the European Commission to the appropriate authorities in England. All other processes or terms of the 2017 Regulations remain unchanged. Internationally designated wetlands 'Ramsar Sites' are protected under the CRoW Act (2000) and are not affected by the exit from the EU. Further information on legislation relevant to ornithology and other ecology topics is provided in Appendix 12A: Legislation and Planning Policy Relevant to Ecology and Nature Conservation (ES Volume III, Document Ref. 6.4).

Planning Policy

15.2.3 The Government's policy for delivery of major energy infrastructure that is of relevance to this chapter is set out in the following relevant National Policy Statements (NPS) from the Department of Energy and Climate Change (DECC):

- Overarching NPS for Energy (EN-1; DECC, 2011d);

- Fossil Fuel Electricity Generating Infrastructure (EN-2; DECC, 2011b); and
- Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4; DECC, 2011c).

15.2.4 Together the above NPS require that, where the development concerned is subject to EIA, the applicant should:

- ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of biodiversity conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity (paragraph 5.3.3, NPS EN-1);
- show how the project has taken advantage of the opportunities to conserve and enhance biodiversity interests (paragraph 5.3.1, NPS EN-1);
- include appropriate mitigation measures as an integral part of the Proposed Development. Where the applicant cannot demonstrate that appropriate [integral] mitigation measures will be put in place then appropriate requirements should be attached to any consent and/or planning obligations entered into (paragraph 5.3.18 to 19, NPS EN-1);
- take account of likely environmental impacts resulting from air emissions (paragraph 2.5.6, NPS EN-2);
- include an assessment of the biodiversity effects of proposed gas supply pipeline routes and of the main alternative routes considered, and include proposals for reinstatement of the pipeline route as close to its original state as possible (paragraph 2.21.3, NPS EN-4); and
- where the habitat to be crossed contains ancient woodland, trees subject to a Tree Preservation Order, or hedgerows subject to the Hedgerows Regulations 1997, consider whether it would be feasible to use trenchless technologies under the ancient woodland or thrust bore under the protected tree or hedgerow (paragraph 2.21.6, NPS EN-4).

15.2.5 The policies set out in the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2019a) are also likely to be important and relevant matters to the determination of the Application. The NPPF sets out the Government's planning policies for England and how these are to be applied, and identifies overarching objectives, including the protection and enhancement of the natural environment and improving biodiversity. For additional information, see Appendix 12A (ES Volume III, Document Ref. 6.4) or Chapter 7: Legislative Context and Planning Policy (ES Volume I, Document Ref. 6.2).

15.2.6 The Proposed Development includes infrastructure located within the administrative boundaries of Redcar and Cleveland Borough Council (RCBC) and Stockton-on-Tees Borough Council (STBC). Therefore, the following local planning policies are relevant to the Proposed Development:

- Sustainable Development Policies SD1 and SD4 of the Redcar and Cleveland Local Plan, adopted May 2018. These policies to relate to

requirements for sustainable development, respecting and enhancing biodiversity features and protecting the integrity of Natura 2000 sites;

- Local Spatial Strategy Policy LS4 of the Redcar and Cleveland Local Plan, adopted May 2018. The South Tees Spatial Strategy requires measures to protect European sites, to safeguard and improve sites of biodiversity interest particularly along the River Tees and the estuary, and to encourage integrated habitat creation and management;
- Natural Environment Policies N2 and N4 of the Redcar and Cleveland Local Plan adopted May 2018. These require the protection and enhancement of the Borough's green infrastructure network and green wedges, and biodiversity and geological resources, including avoidance of adverse impacts to internationally and nationally statutory nature conservation designations;
- Sustainable Development Policies SD5 and SD8 of the Stockton-on-Tees Local Plan, adopted January 2019. These set out requirements for the conservation and enhancement of the natural environment, including designations, green infrastructure, priority habitats, ecological networks, woodland and priority species;
- Natural Environment Policy ENV5 and ENV6 of the Stockton-on-Tees Local Plan adopted January 2019. These set out requirements for the protection and enhancement of biodiversity, including maximising biodiversity gains within identified Biodiversity Opportunity Areas (BOAs) in the River Tees Corridor and Teesmouth; and
- Development Principle STDC7 of the Redcar and Cleveland South Tees Area Supplementary Planning Document (SPD) adopted May 2018 sets out expectations for natural environment protection and enhancement, including the requirement to comply with Redcar and Cleveland Local Plan Policy N4 (see above).

15.2.7 Additional planning policy and guidance of potential relevance to the scope of this chapter and/or for interpretation of the above planning policy is given in the following documents:

- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (Department for Environment, Food and Rural Affairs (Defra), 2011);
- Planning Practice Guidance: Natural Environment (Ministry of Housing, Communities and Local Government, 2019b);
- Standing Advice issued by Natural England and Department for Environment, Food and Rural Affairs: Protected species and development (Natural England and Defra, 2014);
- SPD 1: Sustainable Design Guide (STBC, 2011);
- Tees Valley Green Infrastructure Strategy (Tees Valley Joint Strategy Unit, 2008);
- Redcar and Cleveland's Green Space Strategy 2006-2016 (Redcar and Cleveland Partnership, 2006);

- The Tees Lowlands National Character Area (NCA) Profile (Natural England, 2013);
- A Biodiversity Audit of the North East (Brodin, 2001); and
- Priority Habitats and Species in the Tees Valley (Tees Valley Nature Partnership, 2012).

15.2.8 The UK Biodiversity Action Plan (BAP) was withdrawn in March 2011, the lists of Priority Species and Habitats being superseded by those within Section 41 of the NERC Act (2006). Local Biodiversity Action Plans (LBAPs) are no longer used as a formal expression of delivery of biodiversity targets but identify sub-regional priorities for nature conservation and propose agreed actions to conserve/maintain/enhance/increase local Priority Species and Habitats.

15.2.9 Tees Valley Nature Partnership (2012) identify 10 species that can be regarded as LBAP Priority Species on this basis. These are barn owl (*Tyto alba*), ringed plover (*Charadrius hiaticula*), grey partridge (*Perdix perdix*), tree sparrow (*Passer montanus*), corn bunting (*Emberiza calandra*), shelduck (*Tadorna tadorna*), little tern (*Sternula albifrons*), bittern (*Botaurus stellaris*), swift (*Apus apus*) and yellow wagtail (*Motacilla flava*).

15.2.10 Further information on the planning policy and guidance outlined above is provided in Appendix 12A: Legislation and Planning Policy Relevant to Ecology and Nature Conservation (ES Volume III, Document Ref. 6.4).

Guidance

15.2.11 Eaton *et al.* (2015), summarised by the Royal Society for the Protection of Birds[1], have published lists of Birds of Conservation Concern (BoCC). Red List species are those that have declined in numbers and/or range by at least 50% over the last 25 years, those that have shown an historical population decline between 1800 and 1995; and species that are of global conservation concern. The species on the Red List are of the most urgent conservation concern.

15.2.12 Amber List species include those that have shown a moderate decline in numbers and/or range (25%-49%) over the last 25 years and those with total populations of less than 300 breeding pairs. Also included are those species which represent a significant proportion (greater than 20%) of the European breeding or wintering population, those for which at least 50% of the British population is limited to 10 sites or less, and those of unfavourable conservation status in Europe.

15.2.13 The remaining species are placed on the Green List, indicating that they are of low conservation priority. These species still receive full protection through the provisions of the WCA. Certain introduced non – native species such as Canada goose (*Branta canadensis*) are not listed and for the purposes of this report are classed as having no conservation status in the UK.

15.2.14 These lists confer no legal status. However, they are useful when assessing the significance of predicted impacts and determining the level of mitigation

[1] https://www.bto.org/sites/default/files/shared_documents/publications/birds-conservation-concern/birds-of-conservation-concern-4-leaflet.pdf

that may be required when birds are affected by development or any other activity. Furthermore, inclusion on the Red List is a factor in determining the species for which national or Local Biodiversity Action Plans (BAPs) were developed.

15.3 Assessment Methodology and Significance Criteria

15.3.1 This section presents the methodology for assessing the impacts of the Proposed Development on ornithological receptors.

Use of the Rochdale Envelope

15.3.2 In accordance with the Planning Inspectorate (PINS) Advice Note 9 (PINS, 2018), the ES presents a robust yet reasonable worst case assessment of the potential impacts of the Proposed Development on terrestrial ecology, using Rochdale Envelope principles where a degree of flexibility needs to be maintained for certain aspects of the design. This is addressed case by case, as relevant, within the following ecological impact assessment (EcIA).

15.3.3 The exact nature of the Proposed Development and the scope of the necessary construction works is dependent, in some cases, on the condition of existing infrastructure. Investigations into the feasibility of using the existing infrastructure are ongoing and so for the purpose of the assessments presented in this chapter, the reasonable worst-case scenario has been assumed. Further information can be found in Chapter 5: Construction Programme and Management and Table 4.1 of Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2).

Impact Assessment and Significance Criteria

15.3.4 EcIA is the process of identifying, quantifying and evaluating potential effects of development-related or other proposed actions on habitats, species and ecosystems and forms the ecological component of the wider EIA.

15.3.5 The EcIA detailed in this chapter has been undertaken in accordance with the CIEEM guidance (2019). Full details of this approach are provided in Appendix 12B: EcIA Methods (ES Volume III, Document Ref. 6.4), with an abridged overview provided below. The aims of the ornithology assessment are to:

- identify relevant ecological features (i.e. designated sites, habitats, species or ecosystems) which may be impacted;
- provide a scientifically rigorous and transparent assessment of the likely ecological impacts and resultant effects of the Proposed Development. Impacts and effects may be beneficial (i.e. positive) or adverse (i.e. negative);
- facilitate a scientifically rigorous and transparent determination of the consequences of the Proposed Development in terms of national, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and

- set out what steps would be taken to adhere to legal requirements relating to the relevant biodiversity and geological features concerned.

15.3.6 The principal steps involved in the CIEEM guidance can be summarised as:

- ecological features that are both present and could be affected by the Proposed Development are identified (both those likely to be present at the time works begin, and for the sake of comparison, those predicted to be present at a set time in the future) through a combination of targeted desk-based study and field survey work to determine the relevant baseline conditions;
- the importance of the identified ecological features is evaluated to place their relative nature conservation value into geographic context, and this is used to define the relevant features that need to be considered further within the impact assessment process;
- the changes or perturbations predicted to result as a consequence of the Proposed Development (i.e. the potential impacts), and which could potentially affect relevant ecological features are identified and their nature described. Established best-practice, legislative requirements or other incorporated design measures to minimise or avoid impacts are also described and are considered;
- the likely effects (beneficial or adverse) on relevant ecological features are then assessed, and where possible quantified;
- measures to avoid or reduce any predicted significant effects, if possible, are then developed in conjunction with other elements of the design (including mitigation for other environmental disciplines). If necessary, measures to compensate for effects on features of nature conservation importance are also included; and
- any residual effects of the Proposed Development are reported.

15.3.7 It is not necessary in the assessment to address all habitats and species with potential to occur in the Study Area, and instead the focus should be on those that are 'relevant'. The CIEEM guidance (2019) makes clear that there is no need to "*carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and would remain viable and sustainable*". This does not mean that efforts should not be made to safeguard wider biodiversity, and requirements for this have been considered throughout the design evolution process, for example by avoiding impacts to ponds and watercourses, regardless of whether protected species have been recorded in these waterbodies.

15.3.8 Further detail on how the design evolution has had regard to the safeguarding of biodiversity and how wider biodiversity matters will be managed is provided in Chapter 6: Alternatives and Design Evolution (ES Volume I, Document Ref. 6.2) and within the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12) respectively. Additional measures for environmental protection during construction are included in the Framework Construction Environmental Management Plan (CEMP) (Appendix 5A, ES Volume III, Document Ref. 6.4).

15.3.9 To support focussed EcIA, there is a need to determine the scale at which the relevant ecological features, identified through the desk studies and field surveys undertaken for the Proposed Development, are of value. The value of each relevant biodiversity and geological feature has been defined with reference to the geographical scale at which it matters. The frames of reference used for this assessment, and based on the CIEEM guidance, are:

- International (generally this is within a European context, reflecting the general availability of good data to allow cross-comparison);
- National (Great Britain, but considering the potential for certain ecological features to be more notable (of higher value) in an English context relative to Great Britain as a whole);
- Regional (North East);
- County (North Yorkshire, County Durham);
- Borough (RCBC and STBC);
- Local (biodiversity features that do not meet criteria for valuation at a borough or higher level, but that have sufficient value to merit retention or mitigation e.g. for purposes of ensuring no net loss of biodiversity); and
- Negligible (common and widespread biodiversity features of such low priority that they do not require retention or mitigation at the relevant location to otherwise maintain a favourable nature conservation status).

15.3.10 In line with the CIEEM guidance the terminology used within the EcIA draws a clear distinction between the terms ‘impact’ and ‘effect’. For the purposes of the EcIA, these terms are defined as follows:

- Impact – actions resulting in changes to ecological features. For example, demolition activities leading to the removal of a building utilised as a nesting site by barn owls; and
- Effect – outcome resulting from an impact acting upon the conservation status or structure and function of an ecological feature. For example, if there were losses of barn owl nest sites that could reduce opportunities for breeding and could potentially have an adverse effect on the conservation status of the population at Local scale.

15.3.11 When describing potential impacts (and where relevant the resultant effects) consideration is given to the following characteristics likely to influence this:

- Beneficial/adverse - i.e. is the change likely to be in accordance with nature conservation objectives and policy;
- Beneficial (i.e. positive) - a change that improves the quality of the environment, or halts or slows an existing decline in quality e.g. increasing the extent of a habitat of conservation value;
- Adverse (i.e. negative) - a change that reduces the quality of the environment e.g. destruction of habitat or increased noise disturbance.
- Magnitude - the ‘size’, ‘amount’ or ‘intensity’ of an impact - this is described on a quantitative basis where possible;

- Spatial extent - the spatial or geographical area or distance over which the impact/effect occurs;
- Duration - the time over which an impact is expected to last prior to recovery or replacement of the resource or feature. Consideration has been given to how this duration relates to the relevant biodiversity and geological characteristics, for example a species' lifecycle. However, it is not always appropriate to report the duration of impacts in these terms. The duration of an effect may be longer than the duration of an activity or impact;
- Reversibility - i.e. whether the impact is temporary or permanent. A temporary impact is one from which recovery is possible, or for which effective mitigation is both possible and enforceable. A permanent effect is one from which recovery is either not possible, or cannot be achieved within a reasonable timescale (in the context of the feature being assessed); and
- Timing and frequency - i.e. consideration of the point at which the impact occurs in relation to critical life-stages or seasons.

15.3.12 For each ecological feature, only those characteristics relevant to understanding the effect and determining the significance are described. The determination of the significance of effects has been made based on the predicted effect on the structure and function, or conservation status, of relevant ecological features, as follows:

- Not significant - no effect on structure and function, or conservation status; and
- Significant - structure and function, or conservation status, is affected.

15.3.13 For significant effects (both adverse and beneficial) this is qualified with reference to the geographic scale at which the effect is significant (e.g. an adverse effect significant at a national level).

15.3.14 The CIEEM guidance described in Appendix 12B: EcIA Methods (ES Volume III, Document Ref. 6.4) broadly accords with the EIA methodology described in Chapter 2: Assessment Methodology (ES Volume I, Document Ref. 6.2). However, the matrix has not been used to classify effects as this would deviate from CIEEM guidance. In order to provide consistency of terminology in the final assessment, the findings of the CIEEM assessment have been translated into the classification of effects scale used in other chapters of the ES as outlined in Table 15-1. The category of 'Negligible' effects, defined in Chapter 2: Assessment Methodology (ES Volume I, Document Ref. 6.2), as an "*imperceptible effect to an environmental resource or receptor*", is analogous to the category of 'Neutral' as set out below.

Table 15-1: Relationship Between CIEEM Assessment Terminology and Those Used in Other ES Chapters

CIEEM assessment terminology	Equivalent terminology used in other ES chapters (as set out in Table 2-1 of Chapter 2, ES Volume I, Document Ref. 6.2)	
Beneficial effect on structure/ function or conservation status at regional, national or international level.	Significant (beneficial)	Major beneficial
Beneficial effect on structure/ function or conservation status at County level.		Moderate beneficial
Beneficial effect on structure/ function or conservation status at Site or Local level.	Not significant	Minor beneficial
No effect on structure/ function or conservation status.	Not significant	Neutral
Adverse effect on structure/ function or conservation status at Site or Local level	Not significant	Minor adverse
Adverse effect on structure/ function or conservation status at County level.	Significant (adverse)	Moderate adverse
Adverse effect on structure/ function or conservation status at Regional, National or International level.		Major adverse

Study Area

15.3.15 The Study Areas used in this assessment were defined with reference to the likely Zone of Influence (ZoI) over which the Proposed Development may have potential to result in significant effects on relevant ornithological features, but also with regard to the precautionary principle to ensure sufficient data was gathered to meet worst case needs for impact assessment and ongoing design iterations.

15.3.16 These ZoI are feature specific, for example the ZoI for assessment of potential impacts and effects on localised assemblages of breeding birds is much smaller than that for assessment of air quality impacts or on species with large breeding, home or foraging ranges. The feature-specific ZoI are identified within the relevant method statements set out in Appendix 15A: Baseline Ornithology Report (ES Volume III, Document Ref. 6.4).

15.3.17 It is important to recognise that the potential ZoI of the Proposed Development may vary over time (e.g. the construction ZoI may differ from the operational ZoI) and/ or depending on the individual sensitivities and the spatial extent of the core areas within which individual species are active. For this reason, the largest potential ZoI has been presented in Figure 15-1: Study Areas (ES Volume II, Document Ref. 6.3) at up to 15 km from the Site boundary; this was used for the consideration of species that breed at locations distant from the Proposed Development but that may nevertheless be affected when foraging close to the Proposed Development. In addition to the ornithological features considered within the Study Area, some transient species from other designated sites may enter the ZoI for the Proposed

Development. This is considered further within the Habitats Regulation Assessment Report (Document Ref. 5.13).

15.3.18 The extent of the Study Areas applied during the desk study and field surveys are set out in further detail within "Sources of Information" below.

Sources of Information

15.3.19 The ornithological baseline has been determined through a combination of desk study and field survey, the scope and spatial extent of which are set out in detail in the baseline reports appended to this chapter (i.e. Appendix 12C: PEA Report and Appendix 15A and 15B: Baseline Ornithology Reports (ES Volume III, Document Ref. 6.4), and summarised below. The approach to baseline development and the wider EcIA has been discussed with Natural England and other relevant stakeholders throughout the process of Proposed Development design and EIA to date.

Desk Study

15.3.20 A desk study was undertaken throughout 2018/2019 and updated in 2020 to identify sites designated specifically for their ornithological interest, as well as protected and notable species of potential relevance to the Proposed Development. Ongoing gathering of third-party data enabled the baseline to be updated in line with changes to the design and extent of the Proposed Development and to ensure that the data remained contemporary. The desk study was carried out using the data sources summarised in Table 15-2 and is described further in Appendices 12C: PEA Report and 15A: Baseline Ornithology Report (ES Volume III, Document Ref. 6.4).

15.3.21 Protected and notable species include those listed on Annex I of the European Wild Birds Directive, Schedule 1 of the WCA; and species and habitats of principal importance for nature conservation in England listed under Section 41 (S41) of the NERC Act. Other species have also been considered and assessed on a case by case basis, e.g. those included in national, regional or local Red Data Books and Lists but not protected by legislation.

15.3.22 Alongside ongoing engagement with Natural England, further species–specific data have been requested from several organisations to help provide a contemporary baseline to underpin the finalised impact assessments, as well as mitigating limitations to survey scope arising from limited access to privately owned land.

Table 15-2: Desk Study Area and Data Sources

Data Source	Accessed	Data Obtained (Figure 15-1 ES Volume II, Document Ref. 6.3)
Multi-Agency Geographic Information for the Countryside (MAGIC) website https://magic.defra.gov.uk/	March 2018	• International and national statutory nature conservation designations within 15 km of the CCGT power station (due to requirements for air quality impact assessment) or otherwise within an Impact Risk Zone (IRZ) identified by Natural England and relevant to the wider Proposed Development (i.e. within an IRZ for 'infrastructure development');

Data Source	Accessed	Data Obtained (Figure 15-1 ES Volume II, Document Ref. 6.3)
		• Local statutory designations within 2 km; and • Notable habitats within 1 km.
Joint Nature Conservation Committee (JNCC) Website (UK Protected Sites) http://jncc.defra.gov.uk/	March 2018, December 2020	• Citations and data sheets for international nature conservation designations (SPA and Ramsar sites).
Archived Natural England Website https://designatedsites.naturalengland.org.uk/SiteSearch.aspx	March 2018, December 2020	• Citations for national nature conservation designations: SSSI and National Nature Reserves (NNR). • Details on LNRs.
Environmental Records and Information Centre (ERIC) North-East	March 2018, updated January 2021	• Non-statutory designations within 2 km (LWS); • Protected and notable species records within 1km (records for the last 10 years only); and • Priority habitats within 1 km.
Ordnance Survey 1:25,000 Pathfinder maps and aerial photography	Throughout EIA process	• Information on habitats and habitat connections (based on aerial photography) relevant to interpretation of planning policy and assessment of potential protected and notable species constraints.
Industry Nature Conservation Association (INCA)	April and May 2020	Species data for the Teesside Area as far north as Hartlepool and south to Marske and all terrestrial habitats within the Hinterland of the tidal River Tees: • Records of notable species • Roost and colonial breeding site locations for selected species. • Species monitoring reports and baseline ornithology reports.
British Trust for Ornithology Wetland Birds Survey	September 2018, updated December 2020 and January 2021	• Core count 5-year synopsis tables for 7 Core Count[2] Sectors (Coatham Sands North; Redcar and Coatham Sands South; Quarries and Lagoons; Bran Sands North; Bran Sands South; Coatham Marsh; and Haverton Hole North[3]). The data cover the count years 2012/13 – 2016/17[4].

[2] The Wetland Bird Survey (WeBS) is the long-term monitoring scheme for non-breeding waterbirds in the UK, which aims to provide the principal data for the conservation of their populations and wetland habitats. WeBS is a partnership between the British Trust for Ornithology, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee (the last on behalf of Natural England, Natural Resources Wales, NatureScot and the Department of the Environment Northern Ireland) in association with the Wildfowl and Wetlands Trust. Core counts are synchronised monthly counts undertaken at wetlands throughout the UK.
[3] WeBS count sectors in the Teesside area have recently changed in connection with the confirmation of the proposed extension to the SPA/Ramsar. Haverton Hole North, Cowpen Marsh, Saltholme Central and Saltholme Pools have been sub-divided and renamed. However, the data acquired by AECOM remain spatially relevant.
[4] A BTO WeBS count year runs for 12 months from July through to the following June inclusive.

Data Source	Accessed	Data Obtained (Figure 15-1 ES Volume II, Document Ref. 6.3)
		• Low Tide count data for all available count sectors (21 count sectors) for the Tees Estuary counted over winter 2018-19 inclusive. Available sectors: DT001 – 010, DT016 and DT021 – 030.
Teesmouth Bird Club	April 2020	• Bird Reports for 2016-2018 (Joynt, 2017; Joynt, 2018; and Brown, 2019).
Tees Valley Nature Partnership Website	March 2018	• General information on Local Biodiversity Action Plan Priority Species.

Field Surveys

15.3.23 The scope of works necessary for ornithological surveys was determined through early consultation with Natural England (see Section 15.3) and an initial programme of Phase 1 Habitat survey (as access became available), PEA and ornithology surveys as described respectively in Appendix 12C: PEA Report; and Appendix 15A: Baseline Ornithology Report (ES Volume III, Document Ref. 6.4). The initial survey effort was informed by the design of the Proposed Development when the surveys were commissioned. This was modified and updated over time to reflect changes to the Site boundary and the outcome of consultation, leading to additional surveys in 2020.

15.3.24 The ornithological field surveys undertaken to inform the EcIA are summarised in Table 15-3 and the areas surveyed are shown on Figure 15-2 (ES Volume II, Document Ref. 6.3). Preliminary ecological surveys, as described above, are summarised in Table 12-3 of Chapter 12: Terrestrial Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2). Full details of the scope and methodology for each ornithological survey are provided in the relevant technical appendices (ES Volume III, Document Ref. 6.4), which are cross referenced in Table 15-3 as appropriate.

15.3.25 In summary, the following surveys were carried out prior to 2020:

- Through-the-tide counts of shoreline birds for a period of 12 months (September 2017 – August 2018, inclusive), using a method consistent with the BTO WeBS survey amended to cover the entire tidal range. Counts were undertaken across all intertidal habitat up to approximately 500 m from the Proposed Development where possible;
- High tide counts of wetland birds within pools and areas of brownfield land adjacent to/ within the Proposed Development and up to 500 m where access restrictions were not prohibitive, using a method consistent with the WeBS Core (high tide) Count, over the same calendar period as the intertidal counts and with the same frequency; and
- Surveys of breeding terrestrial birds in 2018, using the Common Birds Census method described by Marchant (1983) and Gilbert *et al.* (1998) across several areas agreed with Natural England that support semi-natural habitat within and adjacent to (up to a maximum of 500 m from the PCC Site and up to 50 m from all other proposed infrastructure) the Proposed Development.

15.3.26 Changes to the design of the Proposed Development necessitated further surveys in 2020 to capture data across a wider area where impacts were expected to occur. The outbreak of the Coronavirus Disease (COVID-19) in spring 2020 and the subsequent governmental advice regarding workplace health and safety protocols influenced the scope and approach to the surveys planned for 2020. The approach taken was consistent with the advice provided by Natural England within their 'Guidance on implications for Natural England's development management advice' (Natural England, 2020). This approach was also discussed on a site-specific basis and confirmed with Natural England throughout April 2020. A revised plan to undertake targeted surveys was finalised in May 2020 and surveys commenced soon after.

15.3.27 Further Common Birds Census (CBC) surveys undertaken in 2020 targeting those parts of the Proposed Development that had not been surveyed previously and that:

- were expected to support infrastructure that required new land take / the building of new infrastructure above ground (i.e. that could not utilise existing infrastructure such as overhead power lines or pipe racking);
- could not be avoided through design of the Proposed Development's layout;
- could not be avoided by installing infrastructure underground using direct drilling (or similar) methods or by adopting existing underground or above-ground infrastructure;
- were accessible safely for survey; and
- may be subjected to significant levels of noise and disturbance during construction.

15.3.28 Barn owl surveys were carried out in September 2020 in response to the identification of suitable nesting and roosting habitat within 500 m of the Proposed Development. The suitable nesting and roosting habitat was identified during bat surveys earlier in 2020 following the methods for surveying suspected and known nest and roost sites in Shawyer (2012).

15.3.29 During 2020 and early 2021 further refinements were made to the Proposed Development, with the removal of some works, such as a water abstraction site, and modifications of methods for others, such as adoption of Horizontal Direct Drilling (HDD) as a method to avoid open-cut trenching through Coatham Dunes and Coatham Sands, which are part of Teesmouth and Cleveland Coast SSSI. The iterative process of EcIA and design development has allowed the ZoI to be reduced from the wide extent of the original study area to the environs of the Proposed Development. This design development and impact avoidance is discussed in Section 15.5. Hence, whilst some of the contextual survey in Table 15-3 is from 2017-2018, this in combination with the surveys in 2020 is considered to provide suitable and proportionate ornithological data for the EcIA of the Proposed Development.

Table 15-3: Ornithological Field Surveys Completed to Date

Ecological survey (and method followed)	Technical appendix (ES Volume III, Document Ref. 6.4)	Survey area (Figure 15-2 ES Volume II, Document Ref. 6.3)	Survey date(s)
Common Bird Census (CBC) (Marchant, 1983)	15A	• Former Redcar Steelworks and land to the east ("Teardrop"); • Steel House Loop; • Coatham Sands and Gare Road; • Saltholme Substation/ Laydown and Access; and • Lackenby Substation[1].	17th April 2018 23rd April 2018 22nd May 2018 12th June 2018 12th July 2018
Intertidal and High Tide Bird Counts (using methodology consistent with BTO WeBS)	15A	• The sand dunes adjacent to Coatham Sands to the north (Count Sectors A-C); • Coatham Marsh to the east of the former Redcar Steelworks and land to the east ("Teardrop") (Count Sectors D & E); • The Teardrop (Count Sectors F & G); • Former Redcar Steelworks and the Teesside works immediately to the south and west of the former Redcar Steelworks (Count Sectors H-L); and • Steel House Pond (Count Sector SHP1)	11th September 2017 25th September 2017 10th October 2017 24th October 2017 14th November 2017 27th November 2017 7th December 2017 19th December 2017 8th January 2018 20th January 2018 1st February 2018 19th February 2018 8th March 2018 19th March 2018 3rd April 2018 10th April 2018 25th May 2018 19th June 2018 27th July 2018 10th August 2018 20th August 2018
Common Bird Census (Marchant, 1983)	15A	• PCC Site; • Haverton Hill Laydown/Welfare; • Navigator Terminal; and • Connection corridors east of the River Tees.[2]	21 May 2020 22 May 2020 3 June 2020 4 June 2020 5 June 2020 15 June 2020 16 June 2020 17 June 2020 1 July 2020
Barn Owl Nest and Roost Surveys	15A	• Several disused industrial buildings within and adjacent to the PCC Site.	15 September 2020

[1] Surveyed to inform assessment of an older Proposed Development Design. Data not used for assessment.

Ecological survey (and method followed)	Technical appendix (ES Volume III, Document Ref. 6.4)	Survey area (Figure 15-2 ES Volume II, Document Ref. 6.3)	Survey date(s)

[2] Including survey areas west, south and east of the Wilton Industrial Estate surveyed to inform assessment of an older Proposed Development Design. Only data for the survey areas between Teesport and Tees Dock Road taken forward for assessment.

Consultation

15.3.30 Pre-application engagement has been ongoing with Natural England since 2017, as summarised below:

- July – August 2017 (Pre-Application engagement consultation);
- September 2017 (Methodology and scope review in response to pre-application engagement);
- March 2019 (Pre-Application engagement meeting);
- April 2019 (Pre-Application engagement meeting;
- February 2020 (Pre-Application engagement meeting);
- July 2020 (Stage 2 consultation – Preliminary Environmental Information (PEI) Report); and
- December 2020 (Update meeting with Natural England).

15.3.31 In July 2017 Natural England were contacted to discuss options for site selection and survey methods appropriate to each site, to which they responded in August 2017. AECOM provided further information on proposed methods and survey areas in September 2017. This resulted in the early adoption of a plot referred to as “Teardrop”, which includes unmanaged grasslands immediately east of the PCC Site as far as Coatham Marsh, and the consideration of a plot referred to as the “Main Site”, which is the same as the PCC Site that has been adopted for the PCC facility within the current iteration of the Proposed Development. The Teardrop Site was subsequently reduced in size to exclude Coatham Marsh.

15.3.32 Natural England recommended that intertidal and high tide bird counts (including counts of all SSSI and SPA interest features, including gulls) and CBC surveys be undertaken within suitable habitats up to 500 m from the Proposed Development. It was agreed that overflying birds would be recorded during surveys to assist in determining any regularly used flight paths over areas where significant infrastructure is proposed. Some recommendations to include certain months in the survey schedule, for individual species (common redshank *Tringa totanus* and ringed plover) were accommodated by adopting a 12-month survey programme. Recommendations to consider impacts on supporting habitats from noise, dust deposition and water abstractions/discharges were acknowledged. The impacts on supporting habitats are primarily addressed in Section 12.6 of Chapter 12: Terrestrial Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2).

15.3.33 The EIA Scoping Opinion Report which was submitted in February 2019 and a Scoping Opinion was received from the Planning Inspectorate in April 2019. The Applicants also undertook a formal Section 42 and Section 47 consultation, which commenced at the same time as the publication of the PEI Report in early July 2020 and ended in September 2020. The issues that have been raised through consultation, and how these have been considered and addressed within the design evolution of the Proposed Development and the EIA is set out where relevant in each of the topic chapters in the ES and in Chapter 6: Alternatives and Design Evolution (ES Volume I, Document Ref. 6.2). A summary of all comments relevant to ecology and how they have been considered and actioned is provided in Chapter 12: Terrestrial Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2). Table 15-4 presents a summary of PINS comments and responses specific or relevant to ornithology.

15.3.34 The scope of the ornithological inputs into the wider HRA was discussed with Natural England (February 2020). This is reported in further detail within the Habitats Regulation Assessment Report (Document Ref. 5.13). Further consultation with Natural England in December 2020 confirmed the acceptance of an appropriate upper limit of 70 dB for noise emissions, to which birds are able to habituate. This noise level is used by Natural England as an appropriate threshold for the Tees and Humber areas, however relative changes in sound level should be assessed as appropriate, focusing on relative changes of 3 dB, 5 dB and 10 dB above existing sound levels.

15.3.35 A consultation meeting was held with representatives of the Royal Society for the Protection of Birds (RSPB) in March 2020 with a follow up meeting in February 2021. Key outcomes of consultations with Natural England and RSPB are presented in Table 15-4.

Table 15-4: Summary of Responses Related to Ornithological Baseline and Assessment

Key Issue Raised / By Whom / Page No.	Response and Action, if appropriate
Receptors, PINS Scoping Opinion p 31 The Scoping Report identifies the Teesmouth and Cleveland Coast SPA, SPA extension and Ramsar site as being in proximity to the Proposed Development. The Inspectorate advises that Natural England is also proposing to extend the Teesmouth and Cleveland Coast Ramsar site (now a Ramsar extension site) and to enlarge the Teesmouth and Cleveland Coast SSSI. The ES should assess the potential impacts to these sites including the proposed extensions.	These extensions, which now form part of the relevant designations, have been fully considered within the EIA. Aspects of the extended designations which are of relevance to birds are considered within this chapter. Chapter 12: Terrestrial Ecology (ES Volume I, Document Ref. 6.2) assesses impacts and effects on terrestrial habitats within these sites and Chapter 14: Marine Ecology (ES Volume I, Document Ref. 6.2) assesses impacts and effects on the marine ecology features of these designations. Details of the relevant terrestrial interest features of the Teesmouth and Cleveland Coast SSSI are provided in Appendices 12C, 12H and 12I (ES Volume III, Document Ref. 6.4).
Study area, PINS Scoping Opinion p31-32	It is confirmed that this is the approach to be taken. Detailed air quality modelling has been completed and is reported in Chapter 8: Air Quality (ES Volume I, Document Ref. 6.2)

Key Issue Raised / By Whom / Page No.	Response and Action, if appropriate
Paragraph 6.21 of the Scoping Report proposes to assess impacts from emissions to air on statutory designated ecological sites within 15 km of the proposed stacks, which is in line with Environment Agency (EA)/ Defra guidance. However, paragraph 6.72 only identifies SSSIs within 5 km of the application site. For the avoidance of doubt, the Inspectorate considers that a study area of 15 km should be applied for all statutory designated sites in line with the EA/ Defra guidance. The ES should identify all types of potential impact pathways to ecological receptors, including water, soil and air. The ES should justify the chosen study areas relevant to the ecological impact assessment, with reference to relevant guidance and the extent of the likely impacts. The Applicant should make effort to agree these study areas with relevant consultation bodies.	and its supporting Appendices (ES Volume III, Document Ref. 6.4). The relevant findings of the assessment are presented within this chapter. Any air quality effects on habitats are primarily assessed in Chapter 12: Terrestrial Ecology (ES Volume I, Document Ref. 6.2).
National and Local designations, PINS Scoping Opinion p 32 The Scoping Report identifies European sites and SSSIs in proximity to the Proposed Development. However, no National Nature Reserves (NNR) or locally designated ecological sites have been identified. The Inspectorate notes that the Teesmouth NNR, a number of local wildlife sites and the Saltholme Royal Society for the Protection of Birds (RSPB) Reserve are located within or in proximity to the application site. The ES should identify any such sites which could be impacted by the Proposed Development and assess any likely significant effects.	All relevant LNR and NNR have now been identified and those relevant for birds are included in this chapter.
CIEEM Guidelines, PINS Scoping Opinion p34 The Applicant proposes to undertake the ecology assessment in accordance with the 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (CIEEM, January 2019) ('the CIEEM guidelines'). The Inspectorate notes that the CIEEM guidelines were updated in 2019 and advises that the most up-to-date version of the guidelines are utilised in the ES.	This chapter considers the CIEEM guidance 2019 updates, as described in more detail in Appendix 12B: EcIA Methods (ES Volume III, Document Ref. 6.4).
Air Quality, PINS Scoping Opinion p35 The assessment of impacts to ecological receptors from changes in air quality should address any likely significant effects from dust and plant during construction and decommissioning, particularly on the designated ecological sites in proximity to the Proposed Development.	The air quality assessment is provided as Chapter 8: Air Quality (ES Volume I, Document Ref. 6.2) and supporting appendices (ES Volume III, Document Ref. 6.4) which assess the impacts of emissions associated with both construction and operation. The findings of these assessments have informed the assessment of effects on ornithological receptors within this chapter.
Supporting data and consultation, Natural England (meeting held 3rd April 2019) • Natural England GIS data is currently being updated and is expected to be available in May	The advice received has been considered during baseline data gathering and within the impact assessments and associated content presented within the final ES (ES Volume I, Document Ref. 6.2).

Key Issue Raised / By Whom / Page No.	Response and Action, if appropriate
• The area of focus for Natural England is along the 'river channel', north of the A66 (south bank) and the Saltholme area (north bank) that is almost all designated as a SSSI/ RSPB reserve. • Biodiversity in the area is subject to a master planning approach across the banks of the River Tees involving four local planning authorities • The Tees Estuary Partnership has a MOU between the EA, NE, MMO and INCA as well as the local authorities and mapping for opportunities for gain (based on Defra metrics) has been undertaken. • The GI layer for these opportunities is available from INCA • The South Gare was identified as an area of risk of UXO being present. This drove the Breagh pipeline to be constructed using open cut methods. This was accepted by Natural England on the basis that they had a restoration plan already in place before the works were undertaken. The area is noted to have recovered well. • NE advised that Tees Valley Wildlife Trust operates locally, manages Coatham Marsh and works with INCA. • It was agreed that the Phase 1 of the areas previously not surveyed would be undertaken and shared with Natural England to agree the need and nature of further survey work. INCA should also be consulted. • The approach to assessing noise impacts on birds should be based on a 70 dB threshold at the receptor for construction impacts.	The Proposed Development no longer includes an option for the use of open cut methods to cross Teesmouth and Cleveland Coast SSSI. Instead, trenchless methods will be used to install connection infrastructure beneath the SSSI.
Teesmouth and Cleveland Coast SSSI, Natural England, letter response to Stage 2 Consultation dated 17th September 2020 The proposal will directly impact the Teesmouth and Cleveland Coast Site SSSI during construction and operation. We note and welcome the commitment to ensure that a fully detailed Environmental Management Plan and Restoration Scheme will be developed and implemented to ensure no long-term detriment to the designated site interest features	A Framework Construction Environmental Management Plan (CEMP) is included as Appendix 5A (ES Volume III, Document Ref. 6.4) and an Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12) is included as part of the Application.
Protected species, Natural England, letter response to Stage 2 Consultation dated 17th September 2020 Based on the information provided Natural England advises that the proposal has the potential to impact species protected by UK and EU legislation. We note that further species-specific surveys are being undertaken and will be used to inform the EIA, as well as any required protected species licence applications.	All relevant surveys have been completed, as detailed in Appendices 15A and 15B (ES Volume III, Document Ref. 6.4), to permit a robust ornithological impact assessment. Potential impacts on relevant protected species are addressed in Section 15.6: Likely Significant Effects of this chapter.

Key Issue Raised / By Whom / Page No.	Response and Action, if appropriate
Teesmouth and Cleveland Coast SSSI, Teesmouth Environmental Trust, email response to Stage 2 Consultation dated 21st July 2020 Must minimise potential detrimental effect on the SSSI and any important ecological features.	No construction works are now proposed within the boundary of the SSSI. The SSSI will be bypassed through the use of trenchless construction methods. Any Potential impacts on designations and species have been considered and avoided or mitigated when developing the development design.
North York Moors National Park Authority, letter response to Stage 2 Consultation dated 17 August Alterations in levels of air pollution during construction, operation and decommissioning of the site could impact North York Moors SAC/SPA.	This has been assessed and no significant adverse effects are predicted. Detailed assessment is provided in Chapter 8: Air Quality (ES Volume I, Document Ref. 6.2) and its supporting Appendices (ES Volume III, Document Ref. 6.4), and Habitats Regulations Assessment Report (Document Ref. 5.13).
Ornithological receptors including Saltholme RSPB Reserve, RSPB (meeting held 18th February 2021) • Updates to Proposed Development design and noise modelling for construction of the CO_2 Gathering Network corridor was presented based on L_{Aeq} values. RSPB expressed greater interest in L_{AFmax} values at these locations. • Key mitigation was summarised (CEMP, ECoW, phasing of works around wintering/breeding bird sensitivities.) RSPB stated that other works in the area have aimed for commencement in late August and completion by end of October to minimise impacts. Consideration of impacts on the SPA/SSSI is key priority and it was confirmed that discussion is ongoing with NE. • Easement and access track, currently owned by Sembcorp, alongside the existing pipe racking along the edge of the Reserve is to be used for installation of CO_2 Gathering Network in this area. • An issue affecting Saltholme currently is flooding, especially north of the pipe racking corridor. An ongoing initiative to address this is the Tees Tidelands Project, partly administered by the EA. Land to the south of the easement is grass fields where numbers of breeding birds are small (especially adjacent to the existing corridor and access track), including small numbers of lapwing. RSPB stated there are unlikely to be any issues with using this easement and this has been done recently for work associated with a power plant to the west. RSPB suggested there is an opportunity to phase work to coincide with the Tees Tidelands project to minimise impacts.	All items discussed and suggestions from RSPB will be looked at and further information provided where required. Phasing/timing of works and tying into goals of Tees Tidelands Project will be investigated for the construction phase.

15.4 Baseline Conditions

Existing Baseline

15.4.1 The ornithological features relevant to the Proposed Development are summarised in Table 15-5. Full details of the findings of desk and field-based studies and detailed accounts of the ornithological features within the Study Area are provided in Appendix 15A: Ornithology Baseline Report and Appendix 15B: Confidential Ornithology Baseline Report (ES Volume III, Document Ref. 6.4). Appendix 12C: PEA Report (ES Volume III, Document Ref. 6.4) includes further information on habitats and the wider ecological (i.e. non-ornithological) reasons for designation of sites of nature conservation. These appendices should be referred to where more information is required on the grounds for scoping ornithological receptors in and out of impact assessment.

15.4.2 The HRA, which is informed in part by the Ornithological assessment within this chapter, is included as the Habitats Regulations Assessment Report (Document Ref. 5.13).

15.4.3 In accordance with the assessment methods summarised in Section 15.3 and provided in more detail in Appendix 12B: EcIA Methods (ES Volume III, Document Ref. 6.4), relevant ornithological features are all of those considered to be of borough or higher nature conservation value, as well as features of local value where they considered important for purposes of ensuring no net loss of biodiversity.

15.4.4 Ornithological receptors can be coarsely divided into ornithological features of designated sites, individual species and species assemblages. The key ornithological features, and their characteristics, identified as contributing to the baseline are summarised in Table 15-5. Broader ecological features for which the sites are designated are set out in Table 12-5, Chapter 12: Terrestrial Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2).

15.4.5 Birds are highly mobile, therefore the species for which sites are designated are presented separately in order that the baseline for each species, and by default the baseline for each designated site as a whole can be clearly defined.

15.4.6 Designated sites considered in this chapter are restricted to those designated specifically for their ornithological interest. These are shown on Figures 15-3: Statutory Designated Sites and 15-4: Non-statutory Designated Sites (ES Volume II, Document Ref. 6.3). For the consideration of air quality impacts only these are:

- Northumbria Coast SPA;
- Durham Coast SSSI;
- North York Moors SPA; and
- North York Moors SSSI.

15.4.7 For all potential impacts, the designated sites considered in this chapter are:

- Teesmouth and Cleveland Coast SPA;

- Teesmouth and Cleveland Coast Ramsar;
- Teesmouth and Cleveland Coast SSSI;
- Teesmouth NNR;
- RSPB Saltholme Reserve; and
- Coatham Marsh LWS.

15.4.8 There are no LNRs notified for ornithological interest features within the Study Area.

15.4.9 Species identified as receptors in Table 15-5 include those that are reasons for the designation of sites such as SPAs and SSSIs and those that are entirely separate from and do not contribute to any designation. However, some species contribute both to the interest features of designated sites and also occur in an individual capacity not related to those designations. For example, ringed plover is part of the non-breeding assemblage feature of the Teesmouth and Cleveland Coast SSSI, however it is also present in the wider area as a breeding species and its importance for conservation at local scale is also considered in the assessment. Species that contribute to the interest features of a designated site are therefore valued at the level of the designation. However, they have also been valued separately so that occurrences of such species can be assessed where this does not contribute to the interest features of a designated site and the scale of importance of the population for nature conservation in the study area is less than national or regional scale.

15.4.10 All other relevant species are valued as part of broader assemblages except where individual species are identified that meet one or more of the following criteria, in which case they are valued separately from the assemblage in which they were recorded:

- Contribute disproportionately to the nature conservation value of an assemblage; or
- Are afforded elevated levels of protection under the WCA (Schedule 1 species) and can be identified as occurring at a specific location.

15.4.11 Values have been assigned to relevant species receptors occurring within the Study Area based on the geographic scale at which that population is important. In doing so, consideration has been given to the perceived importance, rarity of vulnerability of the species with reference to:

- Inclusion on the RSPB Red and Amber Lists of Conservation Concern;
- Inclusion on the Priority Species List for Teesside (Tees Valley Nature Partnership, 2012);
- The known abundance of the species within the Teesmouth Bird Club reporting area, which includes the Boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool (Joynt, 2017; Joynt, 2018; and Brown, 2019);

- The known abundance of the species stated in the relevant County avifaunas for Durham (Bowey and Newsome, 2012) and Yorkshire (Dobbs, 2020);
- Inclusion as a notified feature of a designated site;
- Inclusion on the lists of nationally rare or scarce species in Brown (2019); and
- Rare breeding species monitored by the Rare Breeding Birds Panel (RBBP: https://rbbp.org.uk/list-of-species-currently-reported-on-by-rbbp/, accessed January 2021).

Table 15-5: Summary of Relevant Ornithology Features Requiring Further Assessment of Impacts and Effects

(C = construction, O = operation[2], n/r = not relevant)

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
International Statutory Designated Sites[5] (Figure 15-3, ES Volume II, Document Ref. 6.3)							
Teesmouth and Cleveland Coast SPA	Internationally important numbers of marine and shore birds, including: • *Recurvirostra avosetta*; (Pied) avocet (Breeding) • *Calidris canutus*; (Red) knot (Non-breeding) • *Calidris pugnax*; Ruff (Non-breeding) • *Tringa totanus*; (Common) redshank (Non-breeding) • *Thalasseus sandvicensis*; Sandwich tern (Non-breeding) • *Sterna hirundo* Common tern (Breeding); • *Sternula albifrons* Little tern (Breeding); • Waterbird assemblage of 26,014 individual waterfowl, major components of which include gadwall (*Mareca stepera*), shoveler (*Spatula clypeata*), sanderling	The PCC Site is immediately south of the SPA. The CO_2 Export Pipeline, Water Discharge Connection corridor; and CO_2 Gathering Network are located within the SPA.	International, statutory protected	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources Chapter 11: Noise and Vibration; Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report; Chapter 14: Marine Ecology; Appendix 15A: Baseline Ornithology Report; and	C, O	C, O	**Scoped in.** Indirect construction and/or operational impacts possible as a result of changes in air quality and effects on habitats used by ground nesting and roosting birds; and noise disturbance of roosting and nesting birds during construction and operation.

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development: PCC Site	Relevance to assessment of the Proposed Development: Connection Corridors[3]	Summary of Scoping (signposting to evidence)[4]
	(*Calidris alba*), wigeon (*Mareca penelope*), lapwing (*Vanellus vanellus*), herring gull (*Larus argentatus*) and black-headed gull (*Chroicocephalus ridibundus*) and • In addition to breeding sites the SPA includes areas designated for marine foraging habitats for little tern (Sternula albifrons) and common tern (*Sterna hirundo*) that extend several kilometres out to sea and along the tidal River Tees; and terrestrial and intertidal foraging areas for avocet (Recurvirostra avosetta) and ruff (*Calidris pugnax*).			Habitats Regulations Assessment Report (Document Ref. 5.13).			
Teesmouth and Cleveland Coast Ramsar	Internationally important numbers of marine and shore birds, including: • Peak winter count of 9,528 waterfowl (5-year peak mean 1998/99-2002/03) • Peak spring/autumn count of common redshank (*Tringa totanus*); 883 individuals	The PCC Site is immediately south of the Ramsar. The CO_2 Export Pipeline, Water Discharge Connection Corridor and CO_2 Gathering Network are located within the Ramsar.	International, statutory protected	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources	C, O	C, O	**Scoped in.** Indirect construction and/or operational impacts possible as a result of changes in air quality and effects on habitats used by ground nesting and roosting birds; and noise disturbance of roostin and nesting birds during

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
	representing an average of 0.7% of the GB population (5-year peak mean 1998/9-2002/3) • Peak winter count of red knot (*Calidris canutus*); 2,579 individuals representing an average of 0.9% of the GB population (5-year peak mean 1987-1991) Other features include a broad range of freshwater, marsh, intertidal and dune habitats.			Chapter 11: Noise and Vibration; Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report; Appendix 15A: Baseline Ornithology Report; and Habitats Regulations Assessment Report (Document Ref. 5.13).			construction and operation
North York Moors SPA	Breeding golden plover (*Pluvialis apricaria*) and merlin (*Falco columbarius*).	Located 12 km south-east of the PCC Site.	International, statutory protected	Chapter 8: Air Quality; Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report;	n/r	n/r	Scoped out. The only likely impact at this distance is via emissions to air from the PCC Site and impacts on ground nesting habitats. Potential for an impact from nitrogen deposition via emissions to air from the PCC Site. Appendix 8B

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
				Appendix 15A: Baseline Ornithology Report; and Habitats Regulations Assessment Report (Document Ref. 5.13).			(ES Volume III, Document Ref. 6.4) has assessed and confirmed that levels/loads of other relevant pollutants (NOx and ammonia) would not be exceeded.
Northumbria Coast SPA	Internationally important numbers of marine and shorebirds including: • Wintering turnstone (*Arenaria interpres*); • Wintering purple sandpiper (*Calidris maritima*); • Breeding little tern (*Sternula albifrons*); and • Breeding arctic tern (*Sterna paradisaea*).	Located 14.5 km north-west of the PCC Site.	International, statutory protected	Chapter 8: Air Quality; Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report; Appendix 15A: Baseline Ornithology Report; and Habitats Regulations Assessment Report (Document Ref. 5.13).	n/r	n/r	Scoped out. Appendix 8B (ES Volume III, Document Ref. 6.4) has assessed and confirmed that levels/loads of relevant pollutants (NOx, ammonia and nutrient nitrogen) would not be exceeded.

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
National Statutory Designated Sites[5] (Figure 15-3, ES Volume II, Document Ref. 6.3)							
Teesmouth and Cleveland Coast SSSI	Nationally important features supported by a mosaic of coastal and freshwater habitats: • >20,000 Non-breeding waterbirds; • Aggregations of breeding birds – Avocet (*Recurvirostra avosetta*), common tern (*Sterna hirundo*), little tern (*Sternula albifrons*). • Aggregations of non-breeding birds – Gadwall (*Anas strepera*), knot (*Calidris canutus*), purple sandpiper (*Calidris maritima*), redshank (*Tringa totanus*), ringed plover (*Charadrius hiaticula*), ruff (*Calidris pugnax*), sanderling (*Calidris alba*), sandwich tern (*Thalasseus sandvicensis*), shelduck (*Tadorna tadorna*), shoveler (*Spatula clypeata*); and • Assemblages of breeding birds - Mixed: sand-dunes and saltmarsh, lowland open waters and their margins.	The PCC Site is adjacent to the SSSI. The CO_2 Export Pipeline; Natural Gas Connection; Water Discharge Corridor; and CO_2 Gathering Network are located within the SSSI. The designation overlaps with other internationally designated sites of the same name.	National, statutory protected	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Quality; Chapter 11: Noise and Vibration; Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report; Appendix 15C: Baseline Ornithology Report; and Habitats Regulations Assessment Report (Document Ref. 5.13).	C. O	C, O	**Scoped in.** Indirect construction and/or operational impacts possible as a result of changes in air quality and effects on habitats used by ground nesting and roosting birds; and noise disturbance of roosting and nesting birds during construction and operation.

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
Durham Coast SSSI	Designated for: • Aggregations of breeding birds – cormorant, fulmar (*Fulmarus glacialis*), kittiwake (*Rissa tridactyla*), little tern (*Sternula albifrons*); and • Aggregations of non-breeding birds - purple sandpiper (*Calidris maritima*), sanderling (*Calidris alba*).	Located 12.7 km north-west of the PCC Site.	National, statutory protected	Chapter 8: Air Quality; Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report; and Appendix 15A: Baseline Ornithology Report.	n/r	n/r	Scoped out. Appendix 8B (ES Volume III, Document Ref. 6.4) has assessed and confirmed that levels/loads of relevant pollutants (NOx, ammonia and nutrient nitrogen) would not be exceeded.
North York Moors SSSI	Designated for: • Aggregations of breeding birds – golden plover (*Pluvialis apricaria*) and merlin (*Falco columbarius*).	Located 12 km south-east of the PCC Site.	National, statutory protected	Chapter 8: Air Quality; Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report; and Appendix 15A: Baseline Ornithology Report.	O	n/r	Scoped out. The only likely impact at this distance is via emissions to air from the PCC Site. Appendix 8B (ES Volume III, Document Ref. 6.4) has assessed and confirmed that levels/loads of relevant pollutants (NOx, ammonia and nutrient nitrogen) would not be exceeded.

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
Teesmouth NNR	Designated for the following ornithological interest features: • >20,000 waterbird assemblage; • BAP breeding birds; waders, grey partridge (*Perdix perdix*), skylark (*Alauda arvensis*), linnet (*Linaria cannabina*), reed bunting (*Emberiza schoeniclus*); • Non-breeding knot (*Calidris canutus*), redshank (*Tringa totanus*) and shelduck (*Tadorna tadorna*); • Breeding little tern (*Sternula albifrons*); • Ringed plover (*Charadrius hiaticula*) in spring; and • Post-breeding Sandwich tern (*Thalasseus sandvicensis*).	Encompassed within the boundary of Teesmouth and Cleveland Coast SSSI. Located 700 m north of the Natural Gas Connection Corridor and CO_2 Gathering Network and 2.7 km west of the PCC Site	National, statutory protected	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Quality; Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report; and Appendix 15A: Baseline Ornithology Report.	O	n/r	**Scoped in**, due to the need to consider potential air quality impacts (nitrogen deposition) from the operation of the PCC Site on nesting and roosting bird habitats, otherwise too distant and separated from construction at the PCC Site (in Redcar and Cleveland) by estuary of the River Tees. As the NNR is integral to the SSSI, the potential air quality impacts and effects are considered within the assessment provided for the SSSI as a whole.
Non-Statutory Designated Sites (Figure 15-4, ES Volume II, Document Ref. 6.3)							
Saltholme RSPB Reserve	The site is one of the largest breeding colonies of common terns in the UK and breeding lapwing (*Vanellus vanellus*) (red list) are present, as well as being used by foraging peregrine (*Falco peregrinus)* and breeding	Located 1.15 km west of the PCC Site. The CO_2 Gathering Network is adjacent to the reserve at Bran Sands.	Regional, non-statutory	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Quality;	O	C	**Scoped in**. Potential for impacts of construction noise on breeding and non-breeding birds. As the Reserve lies almost entirely within the Teesmouth and Cleveland

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
	species such as marsh harrier (*Circus aeruginosus*), Cetti's warbler (*Cettia cetti*) and little ringed plover (*Charadrius dubius*). Much of the reserve lies within the Teesmouth and Cleveland Coast SPA and SSSI, within the counties of both Durham and North Yorkshire			Chapter 11: Noise and Vibration; Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report; Appendix 15A: Baseline Ornithology Report; and Habitats Regulations Assessment Report (Document Ref. 5.13).			Coast SPA and SSSI, the potential noise impacts and effects are considered within the assessment provided for the SPA and SSSI as a whole. Appendices 8A and 8B (ES Volume III, Document Ref. 6.4) have assessed and confirmed that levels/loads of relevant pollutants (NOx, ammonia and nutrient nitrogen) would not be exceeded.
Coatham Marsh LWS	Designated for a range of wetland habitats, and of interest for a range of breeding and non-breeding birds.	Located 600 m east of the PCC Site. Adjacent to the Water Connection Corridor	County, non-statutory	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Quality; Chapter 12: Terrestrial Ecology and	n/r	n/r[6]	Scoped out. The only likely impacts at this location are from construction noise and air quality impacts (during operation) on the habitats used by breeding and non-breeding birds. Appendices 8A and 8B

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development: PCC Site	Relevance to assessment of the Proposed Development: Connection Corridors[3]	Summary of Scoping (signposting to evidence)[4]
				Nature Conservation; Appendix 12C: PEA Report; and Appendix 15A: Baseline Ornithology Report.			(ES Volume III, Document Ref. 6.4) have assessed and confirmed that levels/loads of relevant pollutants (NOx, ammonia and nutrient nitrogen) would not be exceeded. Chapter 11 has confirmed that critical noise thresholds would not be exceeded.
Species: Teesmouth and Cleveland Coast SPA / Ramsar Annex 1 qualifying species[7]							
Little tern (*Sternula albifrons*)	Breeding and foraging species WBD Annex 1 WCA Schedule 1 RBBP less scarce Amber List LBAP	Two breeding colonies respectively within 13. and 5.3 km of PCC Site, and 4.5 km from the closest part of the Proposed Development. Forages in coastal near-shore waters and occasionally adjacent to Coatham Sands.	National	Chapter 8: Air Quality; Chapter 11: Noise and Vibration; Chapter 14: Marine Ecology Appendix 15A: Baseline Ornithology Report; Appendix 15B: Confidential Baseline Ornithology Report; and	O	C, O	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
				Habitats Regulations Assessment Report (Document Ref. 5.13).			
Common tern (*Sterna hirundo*)	Breeding and foraging species WBD Annex 1 Amber List	Two breeding colonies within 7 km of the PCC Site and within 1 km of the Connection Corridors. Regular foraging along Tidal River Tees and coastline adjacent to Water Connection Corridors and CO_2 Export Pipeline.	Borough	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; Chapter 14: Marine Ecology; Appendix 15A: Baseline Ornithology Report; Appendix 15B: Confidential Baseline Ornithology Report; and	O	C, O	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
				Habitats Regulations Assessment Report (Document Ref. 5.13).			
Avocet (*Recurvirostra avosetta*)	Breeding and foraging species WBD Annex 1 WCA Schedule 1 RBBP less scarce Amber List	Four breeding colonies within approximately 7 km of the PCC Site and between 0.5 km and 2 km of the Connection Corridors. Regular foraging areas north of the River Tees.	National	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; Appendix 15A: Baseline Ornithological Report; Appendix 15B: Confidential Baseline Ornithology Report; and Habitats Regulations Assessment Report	O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
				(Document Ref. 5.13).			
Knot (*Calidris canutus*)	Non-breeding species Amber List	Two roosts within 4 km of PCC Site. Closest is 1.1 km from Water Discharge Corridor. Forages on Coatham Sands within and adjacent to the Water Discharge Corridor and CO_2 Export Pipeline.	Local	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; Appendix 15A: Baseline Ornithology Report; and Habitats Regulations Assessment Report (Document Ref. 5.13).	n/r	C	
Ruff (*Calidris pugnax*)	Non-breeding species WBD Annex 1 WCA Schedule 1 Red List	Not recorded during surveys. Known distribution is almost exclusively at Saltholme RSPB Reserve and North Tees Marshes more than 5 km west of PCC Site	Borough	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources;	O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development: PCC Site	Relevance to assessment of the Proposed Development: Connection Corridors[3]	Summary of Scoping (signposting to evidence)[4]
		and a minimum of a few hundred metres from the CO_2 Gathering Network.		Chapter 11: Noise and Vibration; Appendix 15A: Baseline Ornithology Report; and Habitats Regulations Assessment Report (Document Ref. 5.13).			
Redshank (*Tringa totanus*)	Non-breeding species Amber List	At least 10 regularly used roosts in Study Area. Closest is 2.4 km east of the PCC Site and 1.2 km south-east of the Water Discharge Corridor. Regular occurrence in dunes and dune ponds immediately north of the PCC Site and adjacent to the Water Supply and Discharge Connection Corridors. Also Dabholm Gut and Bran Sands Lagoon.	Local	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; Appendix 15A: Baseline Ornithology Report; and Habitats Regulations	C, O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development: PCC Site	Relevance to assessment of the Proposed Development: Connection Corridors[3]	Summary of Scoping (signposting to evidence)[4]
				Assessment Report (Document Ref. 5.13).			
Sandwich tern (*Thalasseus sandvicensis*)	Non-breeding (migratory) species WBD Annex 1 Amber List	At least four roosts in Study Area including adjacent to Proposed Development.	Local	Chapter 8: Air Quality; Chapter 11: Noise and Vibration; Chapter 14: Marine Ecology; Appendix 15A: Baseline Ornithology Report; and Habitat Regulations Assessment Report (Document Ref. 5.13).	C	C, O	
Species: Teesmouth and Cleveland Coast SPA / Ramsar qualifying wintering assemblage species not already named above as qualifying features individually[7]							
Sanderling (*Calidris alba*)	Non-breeding species Amber List	Two roosts, including adjacent to Water Discharge Corridor	Local	Chapter 8: Air Quality;	C, O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development: PCC Site	Relevance to assessment of the Proposed Development: Connection Corridors[3]	Summary of Scoping (signposting to evidence)[4]
		Forages on coastal sands along most of Teesside Coast including within Water Connection and CO_2 Export Pipeline corridors and 0.5 km north of the PCC Site.		Chapter 11: Noise and Vibration; and Appendix 15A: Baseline Ornithology Report;.			
Shoveler (*Spatula clypeata*)	Non-breeding species Amber List	Mostly at Saltholme wetlands, Greatham Creek and the North Tees Marshes on fresh and brackish waters. Occasional elsewhere including Steel House Pond adjacent to the CO_2 Gathering Network.	Local	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; and Appendix 15A: Baseline Ornithology Report.	C, O	C	
Teal (*Anas crecca*)	Non-breeding species Amber List	Regular presence at Dabholm Gut and Bran Sands Lagoon from autumn to spring.	Local	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and	C, O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development: PCC Site	Relevance to assessment of the Proposed Development: Connection Corridors[3]	Summary of Scoping (signposting to evidence)[4]
		Recorded at Steel House Pond, the Fleet and a pond within Coatham Dunes		Water Resources; Chapter 11: Noise and Vibration; and Appendix 15A: Baseline Ornithology Report.			
Wigeon (*Mareca penelope*)	Non-breeding species Amber List	Small numbers at Coatham Marsh approximately 0.8 km east of the Water Supply Connection Corridor and 1.7 km east of the PCC Site. Recorded once at Steel House Pond	Local	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; and Appendix 15A: Baseline Ornithology Report.	C, O	C	
Lapwing (*Vanellus vanellus*)	Breeding and non-breeding species Red List	Roosts 5.5 km west of the PCC Site and 1.3 km north of the Natural Gas Connection Corridor.	Local	Chapter 8: Air Quality;	C, O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development: PCC Site	Relevance to assessment of the Proposed Development: Connection Corridors[3]	Summary of Scoping (signposting to evidence)[4]
	NERC S41	Breeds on North Tees Marshes including Saltholme RSPB Reserve. Other occurrences: • Coatham Dunes adjacent to the Water Connection Corridors and immediately north of the PCC Site. • Grasslands immediately east of the Electrical Connection corridors and south of the PCC Site. • Breeding pair recorded within the PCC Site.		Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; and Appendix 15A: Baseline Ornithology Report. .			
Herring gull (*Larus argentatus*)	Breeding and non-breeding species Red List NERC S41	Widespread across Teesside. At least one pair recorded breeding on industrial building within the PCC Site. Recorded regularly in industrial land immediately south and west of the PCC Site between Dabholm Gut and Coatham Sands.	Local	Chapter 8: Air Quality; Chapter 11: Noise and Vibration; and Appendix 15A: Baseline Ornithology Report.	C, O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
Black-headed gull (*Chroicocephalus ridibundus*)	Non-breeding species Amber List	Widespread across Teesside coast and estuary. Roosts and feeds at Coatham Sands adjacent to the Water Connection Corridors and immediately north of the PCC Site.	Local	Chapter 8: Air Quality; Chapter 11: Noise and Vibration; and Appendix 15A: Baseline Ornithology Report.	C, O	C	
Teesmouth and Cleveland Coast SSSI species (additional to those listed under SPA Qualifying Features)[7]							
Gadwall (*Mareca strepera*)	Non-breeding species Amber List	Closest key locations are: • Dabholm Gut and Bran Sands Lagoon adjacent to the CO_2 Gathering Network and 1.3 km south of the PCC Site; • Steel House Pond; • Coatham Marsh approximately 0.8 km east of the Freshwater Connection Corridor and 1.7 km east of the PCC Site.	Local	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; and Appendix 15A: Baseline	C, O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
				Ornithology Report.			
Purple sandpiper (*Calidris maritima*)	Non-breeding species. WCA Schedule 1 Amber List	Roosts and other occurrences within Study Area are distant from Proposed Development.	Local	Chapter 8: Air Quality; Chapter 11: Noise and Vibration; Appendix 15A: Baseline Ornithology Report; and Habitats Regulations Assessment Report (Document Ref. 5.13).	O	n/r	
Ringed plover (*Charadrius hiaticula*)	Breeding and Non-breeding species. Red List	Breeds and roosts at Seaton Carew little tern colony 5.3 km north-west of the PCC Site and 3.8 km north-west of the Water Abstraction Corridor. Forages on intertidal habitats of Coatham Sands (adjacent to Water Connection Corridors and	Borough	Chapter 8: Air Quality; Chapter 11: Noise and Vibration; and Appendix 15A: Baseline Ornithology Report.	C, O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development: PCC Site	Relevance to assessment of the Proposed Development: Connection Corridors[3]	Summary of Scoping (signposting to evidence)[4]
		immediately north of PCC Site).					
Shelduck (*Tadorna tadorna*)	Breeding and non-breeding species Amber List LBAP	Year-round presence at Dabholm Gut and Bran Sands Lagoon (adjacent to the CO_2 Gathering Network and 1.3 km south of the PCC Site). Occasionally at Bran Sands. Regular presence at sites north of the River Tees within 1 km of CO_2 Gathering Network and Natural Gas Connection corridor.	Up to Borough	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; and Appendix 15A: Baseline Ornithology Report.	C, O	C	
Teesmouth NNR species assemblage (additional to those already named as qualifying features of other designated sites)							
BAP ground-nesting birds; waders, grey partridge (*Perdix perdix*), skylark (*Alauda arvensis*), linnet (*Linaria cannabina*), reed bunting (*Emberiza schoeniclus*)	Breeding ground nesting bird assemblage: NERC S41 Red List Tees BAP	As per Teesmouth NNR	National within the NNR	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources;	O	n/r	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development: PCC Site	Relevance to assessment of the Proposed Development: Connection Corridors[3]	Summary of Scoping (signposting to evidence)[4]
				Chapter 11: Noise and Vibration; and Appendix 15A: Baseline Ornithology Report.			
Regularly Occurring Species (local or higher value only, excluding species that are reasons for designation of the above nature conservation designations)[7]							
Barn owl (*Tyto alba*)	Breeding, roosting and foraging species WCA Schedule 1 Green List Tees BAP	Several roosts and breeding sites within Study Area. Forages over Coatham Dunes, adjacent grasslands and Coatham Marsh.	Up to Borough	Chapter 8: Air Quality; Chapter 11: Noise and Vibration; Appendix 15A: Baseline Ornithology Report; and Appendix 15B: Confidential Baseline Ornithology Report.	C, O	C	
Little ringed plover (*Charadrius dubius*)	Breeding species. WCA Schedule 1 NERC S41 RBBP scarce	Breeds at several locations within Study Area	County	Chapter 8: Air Quality; Chapter 11: Noise and Vibration;	C	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
	Green List			Appendix 15A: Baseline Ornithology Report; and Appendix 15B: Confidential Baseline Ornithology Report.			
Marsh harrier (*Circus aeruginosus*)	Breeding species WCA Schedule 1 RBBP Scarce Amber List	Confirmed breeding in 2019 within Study Area	National	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise; Appendix 15A: Baseline Ornithology Report; and Appendix 15B: Confidential Baseline Ornithology Report.	O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
Cormorant	Non-breeding species Green List	Regular roost at Bran Sands Island 2.1 km west of the PCC Site. Widespread and thinly distributed across Teesside. Small numbers at ponds 0.6 km and 1 km south of the PCC site.	Local	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; Chapter 9: Surface Water, Flood Risk and Water Resources; and Appendix 15A: Baseline Ornithology Report.	C, O	C, O	
Breeding bird assemblage (PCC Site and Teesworks Laydown)	Sixteen species including five Red List, one Amber List and five NERC S41 species. This feature is assessed exclusive of any individual species named above.	Within the PCC Site.	Local	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration;	C, O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development: PCC Site	Relevance to assessment of the Proposed Development: Connection Corridors[3]	Summary of Scoping (signposting to evidence)[4]
				Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report; and Appendix 15A: Baseline Ornithology Report.			
Breeding bird assemblage within Coatham Dunes	Twenty breeding species including three Red List, six Amber List and one Tees BAP and NERC S41 species. Includes 17 pairs of skylark (*Alauda arvensis*) and a range of dabbling ducks and passerines. This feature is assessed exclusive of any individual species named above.	Adjacent to the PCC Site. Within and adjacent to Water Connection Corridors and CO_2 Export Pipeline.	Borough	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; Chapter 12: Terrestrial	C, O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development: PCC Site	Relevance to assessment of the Proposed Development: Connection Corridors[3]	Summary of Scoping (signposting to evidence)[4]
				Ecology and Nature Conservation; Appendix 12C: PEA Report; and Appendix 15A: Baseline Ornithology Report.			
Breeding bird assemblage immediately east of the PCC Site (including "Teardrop and "Steel House Loop" survey areas).	Thirty-five breeding species (4 Red List, 8 Amber List and 1 Tees BAP and NERC S41 species). Includes several species of dabbling duck and a variety of passerines. This feature is assessed exclusive of any individual species named above.	Immediately east and south-east of the PCC Site. Immediately to the east of the Natural Gas, Electrical and CO_2 Gathering Network corridors.	Local	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report; and	C, O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
				Appendix 15A: Baseline Ornithology Report.			
Breeding Bird Assemblage (Saltholme Laydown and Access)	Eight breeding species recorded (1 Red List). This feature is assessed exclusive of any individual species named above.	Partially within Laydown/Access and CO_2 Gathering Network Corridor.	Local	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report; and Appendix 15A: Baseline Ornithology Report.	O	C	
Breeding bird assemblage	Nine breeding species including 2 Amber List species	Within laydown area and immediately south of CO_2	Local	Chapter 8: Air Quality;	O	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
(Haverton Hill Laydown and Access)	This feature is assessed exclusive of any individual species named above.	Gathering Network corridor.		Chapter 9: Surface Water, Flood Risk and Water Resources; Chapter 11: Noise and Vibration; Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report; and Appendix 15A: Baseline Ornithology Report.			
Breeding Bird Assemblage (connection corridor between Tod Point Substation and A1053/A1058 south of Teesside Works Lackenby)	Includes 14 breeding species (1 Red List, 3 Amber List, and 2 NERC S41 species). This feature is assessed exclusive of any individual species named above.	Within corridor retained for site access along A1053 Tees Dock Road.	Local	Chapter 8: Air Quality; Chapter 9: Surface Water, Flood Risk and Water Resources;	n/r	C	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See Related Chapter or Appendix of ES[1] (Volume I or III)	Relevance to assessment of the Proposed Development		Summary of Scoping (signposting to evidence)[4]
					PCC Site	Connection Corridors[3]	
				Chapter 11: Noise and Vibration; Chapter 12: Terrestrial Ecology and Nature Conservation; Appendix 12C: PEA Report; and Appendix 15A: Baseline Ornithology Report.			

[1] Chapters are held within ES Volume 1 (Document Ref. 6.2); Appendices are held within ES Volume III (Document Ref. 6.4).

[2] For the purposes of this assessment, Operational and Maintenance activities are considered as part of the 'Operation' category. Routine maintenance activities will be localised (largely restricted to the built footprint of the Proposed Development), small-scale and are likely to be trivial relative to the worst-case construction activities that will represent the peak in human disturbance arising from the Proposed Development. As such, if adverse disturbance effects are not predicted as a result of construction and commissioning of the Proposed Development, then it is reasonable and robust to conclude that maintenance activities will also not be adverse. Similarly, decommissioning activities are considered to be suitably enveloped by the worst-case assessment of construction effects. Decommissioning is discussed in paragraphs 15.6.69-15.6.75 supported by Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2).

[3] CO_2 Export Pipeline, Natural Gas Connection, Electrical Connection, Water Supply Connection, Water Discharge and CO_2 Gathering Network Corridors.

[4] Designated sites only. Scoping for species summarised by impact mechanism/pathway in Table 15-6.

[5] Encompasses designations with potential to experience direct effects based on proximity to the Proposed Development, and additional designations identified in Chapter 8: Air Quality (ES Volume I, Document Ref. 6.2) Habitats Regulations Assessment Report (Document Ref. 5.13) that may experience a potential air quality effect (to a maximum distance of 15 km for the operational assessment).

[6] Avoided by the Proposed Development (closest requirement of the Proposed Development is operational use of Northumbrian Water's existing water supply pipeline which is located adjacent to the LWS).

[7] All species identified as relevant in Appendices 12C: PEA Report, 15A: Baseline Ornithology Report and 15B: Confidential Baseline Ornithology Report (ES Volume III, Document Ref. 6.4), are brought forward for impact assessment. Locational information regarding species vulnerable to persecution is treated as confidential and is included only in a separate confidential baseline appendix/chapter (Appendix 15B: Confidential Baseline Ornithology Report, ES Volume III, Document Ref. 6.4).

Summary of Key Locations for Birds

15.4.12 The close association of offshore marine, intertidal, non-tidal coastal, onshore wetlands and terrestrial habitats within the Teesside area are attractive to a wide range of birds. Many of these occur in a regular capacity, while many more occur in an irregular or transient way. While the presence of sites designated for ornithological interest features is aligned with their occurrence, it is contextually important for the assessment of the Proposed Development to understand the key locations for birds more specifically within and close to the footprint of the Proposed Development, and within the wider Study Area.

15.4.13 Within and adjacent to the Proposed Development south of the River Tees, brownfield land characterised by low growing semi-natural grasslands and ephemeral/short perennial habitats between Steel House (see Figure 15A-2, ES Volume III, Document Ref. 6.4) and the PCC Site (including land within the PCC Site) support assemblages of breeding birds of local value that include a number of ground-nesting species such as skylark, linnet, meadow pipit and small numbers of wading birds such as lapwing, which breeds within the PCC Site. Small areas of open habitat west and north of Steel House are used on high tides over winter by roosting and feeding lapwing, with peak numbers recorded at 176.

15.4.14 Coastal habitats adjacent to the PCC Site, Water Discharge Corridor and CO_2 Export Pipeline (Coatham Dunes and Coatham Sands) support a range of breeding, feeding and roosting species. The dune grasslands, open habitats and dune scrub, punctuated by small open waters and ponds that have succeeded to swamp habitats support a breeding assemblage of mostly ground-nesting species (principally skylark, linnet, reed bunting, meadow pipit), warblers and a small number of breeding ducks (shelduck, gadwall and mallard) within the Dune System. Barn owls forage over the dune grasslands and Coatham Marsh LWS. The open habitats around the dune ponds are used by feeding and roosting waders (lapwing and redshank) in winter.

15.4.15 Coatham Sands is used more broadly during the non-breeding season by feeding waders (ringed plover, knot, dunlin, sanderling), although there is little to separate this section of intertidal coastline with the rest of this habitat type across Teesside in terms of the occurrence of such species. Loafing, feeding and roosting sandwich tern and common tern occur on the intertidal habitats here and these species also forage offshore. Little tern occurs less commonly here due to the effect of distance from known nest sites. A high tide roost for oystercatcher, sandwich tern and several other waders occurs above mean high water between the Water Discharge Connection corridors.

15.4.16 South of the River Tees but further from the footprint of the Proposed Development, oystercatcher and cormorant regularly roost at Bran Sands Island, although the habitats within Bran Sands are of interest generally for foraging waders, gulls, common tern and Sandwich tern. Little tern has also been recorded close to this location. The mouth of the River Tees and the tidal extent of the River Tees channel are important for foraging common tern.

The intertidal muds of Dabholm Gut and Bran Sands Lagoon are important foraging areas for a range of SPA and SSSI species including redshank, lapwing, common tern and shelduck.

15.4.17 North of the River Tees, key areas of ornithological interest include Saltholme RSPB Reserve and the North Tees Marshes and Seal Sands Bay. The mudflats, saltmarsh, brackish pools and freshwater pools and coastal grasslands here collectively support a large and diverse range of breeding, roosting and feeding birds that contribute to the interest features of the SSSI and SPA, including breeding common tern, breeding avocet, wintering ruff and large numbers of wintering and breeding waterfowl and waders including redshank, lapwing, wigeon, teal and shelduck across a wide area. RSPB Saltholme Reserve, Seal Sands Bay and the North Tees Marshes broadly account for this ornithological interest, however there are a number of specific locations of particular importance such as the periphery of Seal Sands Bay for roosting waders (redshank, curlew, oystercatcher) and shelduck and several specific locations for breeding common tern and avocet; and. Regular roosts and breeding locations for waders and species for which Teesmouth and Cleveland Coast Ramsar, SPA and SSSI are notified are included in Appendix 15A: Baseline Ornithology Report; and Appendix 15B: Confidential Baseline Ornithology Report (ES Volume III, Document Ref. 6.4) breeding species.

15.4.18 The coastal sands north of the River Tees support scattered breeding colonies of little tern and ringed plover; and high tide roosts for ringed plover and other waders including oystercatcher, knot and grey plover (*Pluvialis squatarola*), however these are distant (generally between 1 and 13 km) from the Proposed Development.

15.4.19 In terms of ornithological constraints to the Proposed Development, the following areas (in order of distance from the Proposed Development) can be considered important. Habitat distribution within these areas is shown on Figure 12C-1: Phase 1 habitat map, ES Volume III, Document Ref. 6.4:

- The brownfield habitats, including semi-improved neutral grassland, ephemeral/short perennial and bare ground intersected by small standing and flowing freshwaters (ponds, streams, ditches and rivers/streams) and ditches within the PCC Site and between the PCC Site and Steel House support a locally important breeding bird assemblage and small numbers of breeding and roosting species that are of greater than local importance;
- Coatham Dunes adjacent to the Water Discharge Corridor and CO_2 Export Pipeline support a locally important assemblage of breeding birds and provide a foraging resource for barn owl;
- Coatham Sands and Bran Sands are important for feeding, roosting and loafing waders, gulls and terns;
- The mouth and channel of the River Tees are important for foraging common tern;

- The north Tees Marshes up to and including Seal Sands Bay and Saltholme RSPB reserve are important for breeding and wintering birds, with particular interest for avocet, wintering ruff and roosting waders and shelduck. Saltholme RSPB Reserve supports a large assemblage and breeding birds; and
- Scattered locations along the coastal sands north of the River Tees are important for breeding SPA and SSSI species and roosting coastal birds.

Future Baseline

15.4.20 This section summarises the foreseeable changes to the ornithological baseline over the short-term construction phase and the medium – long term operational phase and ultimately decommissioning.

Construction (2022 - 2026)

15.4.21 The ecological baseline in 2022-2026 is likely to be similar to the existing baseline, however climate change is a factor which could pose a risk to ornithological receptors.

15.4.22 Future UK Climate Projections 2018 (UKCP18) from the Met Office for the Stockton-on-Tees area (The Met Office, 2019), based on a 1981 – 2000 baseline[5], uses a range of possible scenarios, classified as Representative Concentration Pathways (RCPs), to inform different future emission trends. RCP 8.5 has been used for the purposes of this assessment as a worst-case scenario.

15.4.23 Based on RCP 8.5, there is a 50% probability that sea levels will have risen 80 mm by 2022 (i.e. commencement of construction). An 80 mm increase in sea levels in 2022 would subject the area to coastal squeeze resulting in a loss of mudflat and sandflat habitats, a landward shift in the distribution of intertidal habitats and an extension of subtidal habitats. Consequently, waders may be vulnerable to a loss of suitable feeding and roosting areas. This could affect Teesmouth and Cleveland Coast SPA in particular, which contains large areas of mudflat and sandflat habitat and is designated for breeding and wintering waders and other birds (see Table 15-5). Five-year rolling averages of counts of waders between 1974 – 2008 in the Tees estuary have shown decreases in a number of species reliant on intertidal mudflats such as knot and dunlin (INCA, 2011). It is to be expected that a decrease in the availability of this habitat due to coastal squeezing would lead to further decreases in these species and potential decreases to other species that are showing steady population fluctuations.

15.4.24 Semi-natural habitats within the Study Area are all currently managed to a greater or lesser degree, and this land management is unlikely to change over the short term. All existing habitats are likely to continue to be present, although some minor changes in habitat extent, composition and structure might occur as a result of ecological succession e.g. the gradual establishment of tree and shrub seedlings, minor changes in the extent and

[5] This baseline has been selected as it provides projections for 20-year time periods (e.g. 2020 – 2039).

distribution of ruderal vegetation, or the balance between different agricultural cropping regimes. Therefore, the habitats and species present are very unlikely to undergo significant change prior to the period 2022-2026.

15.4.25 Changes in the distribution of some species would be likely to occur in line with changes in habitats as a result of ecological succession or other natural processes, but over the short term any such changes would be relatively minor.

Operation of the PCC Site (2026 - 2051)

15.4.26 Based on available information, there are no grounds to expect that there would have been any marked change in local land management practice and the majority of habitats by the time of first commercial operation. The short-term baseline described above for construction is equally applicable to the start of operation. Over the medium-term operational life of the Proposed Development, semi-natural habitats, including any new habitats provided as part of the Proposed Development, would be more mature or have experienced successional change e.g. grassland to scrub or scrub to woodland. Where land-use management practices remain unchanged, no substantive change in the habitat baseline would be reasonably anticipated.

15.4.27 There are a variety of nature conservation designations in the vicinity of the Site which are designated for ornithological features. It is difficult to state with certainty how the nature conservation value of these designations might change over the medium to long term operational period, and this would ultimately depend on long-term management regimes. Natural England currently considers some ornithology SSSI units of Teesmouth and Cleveland Coast SSSI (Coatham Dunes) to be in unfavourable condition (Natural England, 2018a). Factors likely to influence (positively or negatively) the integrity and nature conservation value of designations will depend on the suitability of land management regimes, population pressures (e.g. recreational use of sand dune habitats), and over the longer-term climate change and anticipated improvements in air quality as pollutants decrease due to changes in technology and the types of emissions sources[6]. For national and international designations there will remain a legal obligation to maintain or achieve (where this is failing) favourable condition, so the condition of these designations needs to be assumed to be stable or improving over time.

15.4.28 As stated in the baseline described above for construction, climate change could lead to alterations to the extent and distribution of habitats. Based on RCP 8.5, there is a 50% probability that sea levels will have risen 110 mm by 2026 (i.e. commencement of operation). A 110 mm increase in sea level in 2026 would subject the area to further coastal squeeze and loss of mudflat and sandflat habitats, and therefore loss of feeding areas for waders, as discussed in the construction baseline (see paragraph 15.4.14).

[6] The UK's Clean Air Strategy (DEFRA, 2019), details commitments to monitor impacts of air pollution on habitats and reduce the levels of damaging deposition of reactive forms of nitrogen by 17% over England's protected priority habitats by 2030.

15.4.29 It is likely that current and former industrial land adjacent to the Site would be released for new development e.g. in accordance with local plans and policy for regeneration of the South Tees Area. The extent of ornithologically valuable features and habitats may decrease as a result of such development and therefore the relative nature conservation value of remaining areas of remaining areas of suitable ornithological habitat may therefore increase over time. Counter to this, implementation of planning policy and legal requirements (including the Redcar and Cleveland South Tees Area SPD and anticipated legal requirements to deliver substantive biodiversity enhancement) should as a minimum ensure no net loss of biodiversity. Additionally, if implemented successfully as intended, it should also mean that future adjacent developments incorporate features of value for biodiversity with potential for small to moderate improvements in the future baseline over the operational life of the Proposed Development, e.g. certain species may colonise or increase in number as a result of such enhancement. Policy STDC7 of the SPD requires measures to protect and enhance the biodiversity of the South Tees area in accordance with the evolving masterplan.

15.4.30 Changes in the distribution of some species would be likely to occur in line with changes in habitats as a result of ecological succession or other natural processes, but over the short term any such changes would be relatively minor.

Decommissioning of the PCC Site (circa 2051 – 2066)

15.4.31 Strategic-level Climate Change Predictions (CCP), including UKCP18 (The Met Office, 2018) indicate that there is potential for sea level rise of up to 300 mm over the lifetime of the Proposed Development (see Appendix 9A: Flood Risk Assessment (ES Volume III, Document Ref. 6.4), and this may have an influence on the sensitivity of habitat and species features present at decommissioning. For example, some coastal features may be adversely affected by increased inundation or erosion, which may increase the significance of any impacts and effects arising from decommissioning. As described above in the construction and operation baselines, increased sea levels would lead to a loss of important feeding areas for waders in mudflat and sandflat habitat and might result in increased inundation of nest sites used by species that breed on coastal sands.

15.4.32 The decommissioning baseline will be strongly influenced by future land-use and nature conservation regimes affecting adjacent land (as first described above for operation baseline). The balance between adverse effects and habitat improvements beneficial to ornithological features is unknown. This limits the assumptions that can be made for the purposes of this assessment. However, it should also be noted that the likely ZoI of decommissioning will be much smaller than for operation (especially in relation to air quality effects) and also for construction (especially in relation to noise and visual disturbance effects). Decommissioning activities will involve removal of above ground infrastructure only and will primarily be located within the PCC Site, rather than within areas of adjacent semi-natural habitat.

Decommissioning may also proceed to different timeframes within different parts of the Site, and in particular the compressor and CO_2 Gathering Network are likely to remain in operation after the PCC Site is decommissioned. Relevant ecological features will therefore depend on the location and timing of the relevant decommissioning activities, and overall will be fewer and reduced in spatial scale relative to those relevant at construction and operation.

15.4.33 Decommissioning activities will be conducted in accordance with the appropriate guidance and legislation at the time of the Proposed Developments closure. A Decommissioning Plan (including Decommissioning Environmental Management Plan (DEMP)) will be produced and agreed with the Environment Agency as part of the Environmental Permitting and site surrender process. The DEMP will consider in detail all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed. Ecological surveys will be commissioned as appropriate to inform the scope of the DEMP. This is discussed further within Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2).

15.5 Development Design and Impact Avoidance

Development Design

15.5.1 The design process for the Proposed Development has included consideration of biodiversity constraints and has incorporated, where reasonably practical, measures to avoid and reduce the potential for adverse effects on these, in accordance with the 'mitigation hierarchy'[7] (see Appendix 12B: EcIA Methods (ES Volume III, Document Ref. 6.4) and relevant planning policy.

15.5.2 The measures identified and adopted include those that are inherent to the design of the Proposed Development, and those that could realistically be expected to be applied as part of construction or operational environmental best practice, or as a result of legislative requirements.

15.5.3 Specifically, measures to deliver compliance with industry good practice and environmental protection legislation during both construction and operation will be applied in accordance with NPS EN-1 paragraph 4.10.3, or as a result of legislative requirements. e.g. prevention of surface and ground water pollution, fugitive dust management and noise prevention or amelioration. The measures required are already committed as set out in Appendix 5A: Framework CEMP (ES Volume III, Document Ref. 6.4). It must be assumed that all measures available to regulators to secure such requirements will be properly applied and enforced by the relevant regulators. Many of the

[7] The mitigation hierarchy is implemented to achieve no overall negative impact on biodiversity or a net gain and is based on sequential steps through the project life cycle. These are (in order of priority): Avoidance (measures taken to avoid creating impacts from the outset); Minimisation (measures taken to reduce the duration, intensity and/or extent of impacts which cannot be avoided); Rehabilitation/Restoration (measures taken to improve degraded or removed ecosystems following exposure to impacts which cannot be avoided); and Offsetting (measures taken to compensate for residual adverse impacts after implementation of the previous steps).

measures required in support of this are already committed as set out in Appendix 5A: Framework CEMP (ES Volume III, Document Ref. 6.4).

15.5.4 Similarly, it must be assumed that all relevant protected species legislation will be complied with, as this is mandatory. However, to assist transparency on what is required and what would be provided, likely measures required to comply with relevant protected species legislation, including attainment of necessary licences and permits are summarised in Section 15.9: Mitigation and Enhancement Measures of this chapter.

Impact Avoidance Measures

15.5.5 The development design and impact avoidance measures that have been, or would be, adopted during the construction, operation and decommissioning phases of the Proposed Development are described below. See also Chapter 5: Construction Programme and Management (ES Volume I, Document Ref. 6.2) for further details.

15.5.6 Where it is reasonably possible/practicable to do so, routing of proposed connection corridors will utilise existing above ground and/or underground infrastructure to limit the excavations and construction activities required and therefore disturbance to species and habitats present. This will be applied in the case of the installation of the CO_2 Gathering Network. The proposed water supply will use the former Steelworks connection to the Northumbrian Water Limited (NWL) raw and potable water mains to the east of the PCC Site. Where excavations for connections cannot be avoided, then as far as possible the relevant connections will share the same construction corridor e.g. the natural gas and electrical connections east and south of the PCC Site.

15.5.7 For both the replacement outfall and the CO_2 Export Pipeline, trenchless technologies will be used, consisting of the boring of a Micro-Bored Tunnel (MBT) and drilling of a number of HDD bores, respectively. This means that there will be no direct loss of intertidal habitats, foreshore or dune habitats and no effects of habitat loss or direct disturbance on the ornithological features that are dependent on these habitats. The preferred option for the installation of the Water Discharge Connection is the use of the existing pipework and refurbishment of the existing discharge point within the Tees Bay. An alternative option is to use trenchless technologies as described above and in greater detail in Section 5.3 of Chapter 5 (ES Volume I, Document Ref. 6.2). Both options avoid any potential impacts of habitat loss and minimise direct disturbance of ornithological receptors within Coatham Dunes and Coatham Sands. However both MBT and HDD installation methods would require launch pits on the PCC Site (if drilled from on-shore to off-shore as a worst case), that would generate non-percussive but still potentially significant noise emissions. For the purposes of this assessment, and as a worst-case scenario, the HDD launch pit is assumed to be adjacent to the northern boundary of the PCC and thus very close to the Teesmouth and Cleveland Coast Ramsar, SPA and SSSI. This is assessed in Section 15.6.

15.5.8 Measures to deliver compliance with industry good practice and environmental protection legislation during both construction and operation would be applied to minimise the potential for environmental pollution, e.g. prevention of surface and ground water pollution, fugitive dust management, noise prevention or amelioration. In support of this, the construction contractors would prepare and implement a Construction Environmental Management Plan (CEMP) detailing all requirements for environmental protection and legal compliance. Appendix 5A: Framework CEMP (ES Volume III, Document Ref. 6.4) has been prepared and submitted with the Application.

15.5.9 Construction temporary lighting would be arranged so that glare is minimised outside the construction site. An Indicative Lighting Strategy (Document Ref. 5.11) has been prepared for regulatory approval as required and will be detailed in the Final CEMP. Lighting will be designed so as not to cause a nuisance outside of the Site in relation to light disturbance to ecological receptors (see Chapter 5: Construction Programme and Management, ES Volume I, Document Ref. 6.2).

15.5.10 Measures to comply with relevant legislation regarding animal welfare (in accordance with the Animal Welfare Act, 2006) are summarised in the Section 15.7, to provide transparency on what is required and what would be provided.

15.5.11 To ensure legislative compliance in relation to nesting birds, all clearance of suitable vegetation during site preparation would be undertaken outside the breeding season (typically March-August inclusive for most species), where possible. In situations where this is not possible, a suitably qualified ecologist acting as an Ecological Clerk of Works (ECoW) would check the working area for nests before works commence. If nests were discovered, appropriate mitigation would be implemented to ensure that they are not disturbed or destroyed before any works can commence in that area. This would include imposing exclusion zones of a size appropriate to the individual sensitivity of the nest site (which would be determined largely by the location of the nest site, the species present and the level of nest concealment afforded by existing vegetation or built structures) between the works and nest(s) and suspending vegetation clearance works on a localised basis within the vicinity of the nest until any young had fledged.

15.5.12 The ECoW would supervise all relevant site clearance and construction works, where required.

15.5.13 As described in Chapter 8: Air Quality (ES Volume I, Document Ref. 6.2), the final stack height for the Proposed Development has been optimised to minimise ground-level air quality (NOx) impacts on relevant ecological features. Dispersion modelling has been undertaken to determine the optimum stack height range through comparison of the maximum impacts at human health and ecological receptors, to ensure that the impacts at sensitive receptors will be considered to be acceptable. Emissions monitoring will be undertaken during the operational phase of the Proposed

Development to demonstrate compliance with emission limit values set by the Environment Agency.

15.5.14 As detailed in Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2), a detailed lighting scheme would be submitted to RCBC for approval before it is installed. The external lighting scheme would be designed in accordance with relevant standards, such as the Guidance Notes for the Reduction of Obtrusive Light (2020) published by the Institute of Lighting Professionals and/ or Chartered Institution Building Services Engineers requirements, as appropriate. The lighting strategy will set out how lighting impacts on sensitive ecological receptors, including birds, have been considered and addressed and minimised as far as possible, for example by directing lighting away from adjacent habitats.

15.5.15 Surface water discharge will be to Tees Bay and therefore there will be no changes in the flow rate within any of the watercourses within the Study Area. On site wastewater treatment facilities are included in the development design to ensure that the physico-chemical characteristics of discharges of wastewater from the carbon capture process are compliant with legal limits set by the Environment Agency. Sewage and sanitary waste generated on site will be sent to the local sewage network.

15.5.16 Measures for potential inclusion in a Final CEMP to limit potential noise impacts on Noise Sensitive Receptors (NSRs) are set out in Chapter 11 of the ES (ES Volume I, Document Ref. 6.2). While the Final CEMP will not be specifically designed to reduce impacts on bird species, any measures included will also mitigate noise impacts in the SPA / Ramsar and surrounding habitats by reducing noise levels experienced by nesting, roosting and loading birds both within and outside of designated sites. A list of relevant measures for noise mitigation in the Teesmouth and Cleveland Coast SPA / Ramsar includes:

- attaining acceptable noise limits (70 dB L_{Aeq}) at nearby NSRs, including roosting and loafing birds in the SPA / Ramsar pools, in alignment with noise thresholds agreed with Natural England using e.g. noise barriers if required;
- avoiding the use of impact piling techniques in the sensitive overwintering period of SPA / Ramsar birds. The preferred piling method for construction of the PCC is bored piling, which enables compliance with the noise threshold limits agreed with Natural England as set out above;
- no construction works at all within the SPA/Ramsar/SSSI;
- applying measures to limit noise wherever possible and to achieve Best Practicable Means (BPMs);
- using hydraulic rather than percussive techniques for breaking wherever possible to reduce noise production;
- fabricating building elements off-site wherever possible;

- applying maintenance and silencing (where possible) of all plant, equipment and machinery used; turning any equipment off when not in use;
- loading / unloading machinery and dismantling equipment in less noise sensitive locations and / or providing screens to minimise disturbance of SPA / Ramsar birds;
- routing of construction traffic along public roads and access tracks with longest potential distance to known NSRs in the SPA / Ramsar; and
- using visual screens (particularly when working in or near the pools of the SPA / Ramsar) for works associated with the CO_2 Gathering Network.

15.6 Likely Impacts and Effects

15.6.1 This section describes the likely impacts and effects of the Proposed Development on relevant ornithological features in the absence of any mitigation over and above that which is inherent to the design, or otherwise required for purposes of legislative compliance (as described in Section 15.5 above).

15.6.2 This assessment takes account of guidance on requirements for assessment given in NPS EN-1 (paragraph 4.10.3). This states "in considering an application for development consent […] focus on whether the development itself is an acceptable use of the land, and on the impacts of that use, rather than the control of processes, emissions or discharges themselves. … work on the assumption that the relevant pollution control regime and other environmental regulatory regimes, including those on land drainage, water abstraction and biodiversity, will be properly applied and enforced by the relevant regulator." Accordingly, while it remains necessary to assess impacts and effects arising from emissions to air, this is not extended within this chapter to a more speculative assessment of potential pollution sources, given the legislation and regulatory regimes in place to allow control of this, and the mitigation otherwise committed in Chapter 8: Air Quality and Chapter 9: Surface Water, Flood Risk and Water Resources (ES Volume I, Document Ref. 6.2).

15.6.3 The potential impacts of the Proposed Development on ornithological receptors are divisible into those arising from construction and those arising from operation. Many of the impacts on ornithological receptors would occur through effects such as habitat loss or degradation of/changes to foraging resources rather than as direct effects on the birds themselves. This section therefore frequently refers to the impact assessments within other topic-specific chapters, particularly Air Quality (Chapter 8); Surface Water, Flood Risk and Water Resources (Chapter 9); Noise and Vibration (Chapter 11); Terrestrial Ecology and Nature Conservation (Chapter 12); and Marine Ecology and Nature Conservation (Chapter 14). It also draws on the assessment of Likely Significant Effects on internationally designated sites of ornithological interest presented in the Habitats Regulations Assessment Report (Document 5.13), which provides detailed assessment of all effects

likely to affect adversely the integrity and function of the internationally designated sites identified within the Study Area (these are summarised in Table 15-5 and paragraphs 15.4.6 – 15.4.8).

15.6.4 It is not considered necessary in this chapter to replicate the full detail of the impact assessments provided by these source chapters and the LSE assessment presented in the Habitats Regulations Assessment Report (Document Ref. 5.13). This chapter therefore restricts its scope to the relevant points for ornithology, while also signposting the relevant source assessments (much of which has already been identified and considered above in Table 15-5). Where mitigation has been identified as necessary in other chapters to address and remove potential significant adverse effects, then it can be assumed that there is a commitment to provide this mitigation, and that it would be delivered as outlined in the relevant chapter and/ or as specified in the Framework CEMP (Appendix 5A, ES Volume III, Document Ref. 6.4).

15.6.5 Relevant ornithology features/receptors are those that are considered to be of ornithological value at a local or higher geographic level and to have potential to be affected by the Proposed Development, as summarised in Table 15-5.

15.6.6 Construction of the Proposed Development is currently anticipated to occur over a period of 4 years, from late 2022 to 2026. Enabling works including site clearance, remedial and foundation works will occur in the first year, with construction and installation of all proposed infrastructure occurring over the remainder of the construction period.

15.6.7 The potential impacts of construction include the following:

- degradation or losses of habitat;
- disturbance of birds, principally through noise emissions from construction traffic, impact piling, pipe stringing, pipe bending and pipe welding activities;
- emissions of dust and particulate matter from construction sites;
- pollution emissions from heavy plant and construction traffic;
- increases in surface water run-off and flood risk arising from compaction of soils and installation of impermeable surfaces (such as at construction compounds);
- sediment run-off to surface waters affecting wetland habitats used by birds and distribution/quality of foraging resources;
- morphological and hydrological effects on waterbodies;
- impacts on surface water quality arising from leaks or spillages of fuels, oils and chemical compounds used during construction (such as solvents, grouts and paints) and their effects on foraging resources;
- permanent losses of and physical impacts on subtidal habitats during construction of water discharge and the CO2 Export Pipeline with effects

on quality and distribution of foraging resource available to birds and potentially reduced ability of diving birds to capture prey. These may arise from anchoring, grounding or positioning of work boats or barges, boring of a MBT and HDD with breakout points on the sea bed where these emerge into the subtidal environment dredging/disturbance of sediment (for either the new or existing outfall scenarios) and installation of permanent rock armour/scour protection on the seabed (for either scenario);

- noise emissions from the MBT and HDD installation of the CO2 export and potentially the water discharge pipes; and
- disturbance of marine birds arising from the presence of work boats and/or barges and the presence of construction workers in the offshore environment.

15.6.8 The potential impacts of operation of the Proposed Development, relevant to ornithological receptors, include:

- permanent losses of habitat used by nesting, roosting and feeding birds where new infrastructure is installed;
- operational noise emissions from the PCC Site;
- increases in surface water run-off and flood risk arising from the permanent presence of impermeable surfaces serving operational infrastructure;
- pollution emissions from vehicular traffic to and from the PCC Site and other parts of the Proposed Development;
- point source emissions of NOx, acid and nutrient nitrogen arising from the power generation process at the PCC Site and the effects of such emissions on habitats used by birds;
- thermal effects on marine and benthic organisms arising from treated water discharge, resulting in reductions of available foraging resources for some fish-eating birds;
- chemical effects on marine and benthic organisms arising from wastewater discharge, resulting in reductions of available foraging resources for some fish-eating birds; and
- the potential for tall structures required for the operation of the Proposed Development to create a barrier to movement of birds for which Teesmouth and Cleveland Coast Ramsar, SPA and SSSI are designated.

15.6.9 Broad screening has been carried out for designated sites and this is summarised in Table 15-5. Ornithological species receptors will not be affected equally by the potential impacts of the Proposed Development and some receptors will be entirely unaffected by some impacts. For instance, impacts on subtidal or intertidal habitats will have no effects on species solely reliant on terrestrial habitats. To enable a focussed impact assessment, screening was undertaken of the potential effects identified above, with

reference to other topic-specific chapters where necessary, to identify those impacts that are likely to have significant effects on ornithological receptors and that require further impact assessment. Impacts are scoped out of further assessment where they are considered unlikely to result in effects on receptors because:

- there is no impact pathway; or
- an impact pathway exists but the likelihood or frequency of the receptor occurring where that effect occurs is so small as to be insignificant; or
- where an impact is identified within the relevant specialist chapter as likely to occur but at a level that is not significant for the habitat feature(s) on which potential ornithological receptors rely, or on the ornithological receptors themselves; or
- where the impact identified is mitigated to levels that will have no perceivable effect on the receptor(s) through commitments made within an Environmental Management Plan (relevant to one or more of the construction, operation or decommissioning phases) and any other measures implemented to ensure compliance with regulatory requirements that would ensure the avoidance of impacts on ornithological receptors.

15.6.10 The screening described above for species and species assemblages is set out in Table 15-6 with signposting to other specialist chapters where these provide further detailed narrative underpinning the rationale behind scoping. The paragraphs that follow Table 15-6 (paragraphs 15.6.11 – 15.6.75 focus only on those impacts that are screened in for assessment, dividing these into construction, operation and decommissioning impacts, and for the purposes of assessment these are further divided into the category, pathway or mechanism of impact (air quality, habitat losses, noise and vibration effects and so on)).

Table 15-6: Screening Table for Potential Impacts on Birds

Impact	Potential effect on birds	Screened in/out?	Justification for screening	Chapter reference[1]
Construction				
Temporary habitat losses.	Losses of breeding, roosting and or feeding habitats resulting from site clearance and presence of construction areas/compounds.	In	Cannot be eliminated through measures adopted to meet regulatory requirements. Potentially significant.	Chapter 12: Terrestrial Ecology and Nature Conservation, Section 12.6 ('Construction'). Chapter 15: Ornithology, Paragraphs 15.6.15, 15.6.43 and 15.6.45.
Disturbance (noise and visual) during construction of PCC, Water Discharge Connection and CO_2 Export Pipeline.	Displacement from breeding, roosting and/or feeding areas.	In	Cannot be eliminated through measures adopted to meet regulatory requirements. Potentially significant.	Chapter 11: Noise and Vibration, Section 11.6 ('Construction Noise and Vibration'). Chapter 15: Ornithology, Section 15.6 ('Construction of the Natural Gas, Electrical Connection and CO_2 Gathering Network Corridors' and 'Construction of PCC Site').
Emissions of dust and particulates.	Effects on habitats on which birds depend for foraging, breeding or roosting.	Out	Controlled through measures within the CEMP[2]. No significant effect of dust on terrestrial habitats, hence no effect on birds.	Chapter 8: Air Quality, Section 8.6 ('Construction').
Construction traffic and plant airborne pollutant emissions.	Effects on habitats on which birds depend for foraging, breeding or roosting.	Out	Air Quality assessment identifies these impacts as negligible for ecological receptors.	Chapter 8: Air Quality, Section 8.6 ('Construction').
Increased surface water runoff and flood risk.	Effects on habitats on which birds depend for foraging, breeding or roosting, such as through impacts on vegetation or habitat structure, or direct impacts on birds themselves (e.g. by destruction of nests).	Out	Controlled through measures within the CEMP[2].	Chapter 9: Surface Water, Flood Risk and Water Resources, Section 9.6 ('Construction Phase Impacts').

Impact	Potential effect on birds	Screened in/out?	Justification for screening	Chapter reference[1]
Sediment runoff to surface waters.	Effects on habitats on which birds depend for foraging, breeding or roosting through smothering of habitat, increased turbidity of waters or silting up of surface waters.	Out	Controlled through measures within the CEMP[2].	Chapter 9: Surface Water, Flood Risk and Water Resources, Section 9.6 ('Construction Phase Impacts').
Morphological and hydrological effects on water bodies.	Changes to structure and dewatering of wetland habitats on which birds depend.	Out	Identified as short-lived, reversible and insignificant within specialist chapter. Effects on water bodies within Coatham Dunes eliminated through adoption of trenchless technologies for installation of CO_2 Export Pipeline and Water Discharge Connection infrastructure.	Chapter 9: Surface Water, Flood Risk and Water Resources, Section 9.6 ('Construction Phase Impacts'). Chapter 13: Aquatic Ecology, Section 13.6 ('Construction').
Chemical impacts on surface water quality.	Direct toxicity to birds and their foraging resources, changes to food availability and quality.	Out	Controlled through measures within the CEMP[2].	Chapter 9: Surface Water, Flood Risk and Water Resources, Section 9.6 ('Construction Phase Impacts'). Chapter 14: Marine Ecology and Nature Conservation, Section 14.6 ('Construction Phase').
Loss of and physical impacts on sub-tidal habitats at CO_2 Export Pipeline and Water Discharge Connection corridors.	Detrimental effects on prey capture rates for diving birds as a result of: Reduction of food availability, distribution and abundance through changes to physical subtidal environment; and Benthic habitat losses at water outfall and offshore effects of increased turbidity and creation of sediment plumes creating conditions of reduced visibility.	Out	Identified as short lived, small in spatial extent and not significant within specialist chapter.	Chapter 14: Marine Ecology and Nature Conservation, Section 14.6 ('Construction Phase').

Impact	Potential effect on birds	Screened in/out?	Justification for screening	Chapter reference[1]
Disturbance of marine birds resulting from presence of work boats/barges offshore.	Visual disturbance and displacement of birds from feeding areas offshore at location of water discharge point.	In	Cannot be eliminated through control measures. Potentially significant.	Chapter 15: Ornithology, Paragraphs 15.6.35-15.6.37.
Operation				
Permanent habitat losses.	Losses of breeding, roosting and/or feeding habitats where permanent above-ground infrastructure is installed.	In	Cannot be eliminated through control measures. Potentially significant.	Chapter 12: Terrestrial Ecology and Nature Conservation, Section 12.6 ('Operation').
Operational noise emissions and visual disturbance from PCC Site.	Displacement of birds caused by continuous operational noise emissions that exceed baseline levels, visual presence and lighting of the PCC Site.	Out	Identified as not significant in specialist assessment.	Chapter 11: Noise and Vibration, Section 11.6 ('Operational Noise').
Increased surface water runoff and flood risk.	Effects on habitats on which birds depend for foraging, breeding or roosting, such as through impacts on vegetation or habitat structure, or direct impacts on birds themselves (e.g. by destruction of nests).	Out	Identified as not significant following mitigation and avoidance measures set out in specialist chapter.	Chapter 9: Surface Water, Flood Risk and Water Resources, Section 9.6 ('Operation Phase').
Pollution emissions from vehicular traffic to and from the PCC Site.	Effects on habitats on which birds depend for foraging, breeding or roosting.	Out	Identified as not significant for ecological receptors in specialist chapter. Construction air quality impact on habitats – no adverse effects predicted following adoption of good practice measures.	Chapter 8: Air Quality, Section 8.6 ('Operation'). (Appendix 8A, ES Volume III).
Point source emissions of NO_x, acid and nutrient nitrogen from the emissions stack of the PCC.	Localised Effects on habitats on which birds depend for foraging, breeding or roosting.	Out	Deposition of airborne pollutants assessed as not having any significant effects on intertidal habitats, hence there would be no indirect effects on birds. Air quality assessment for Teesmouth and Cleveland Coast SSSI also showed no	Chapter 8: Air Quality, Section 8.6 ('Operation'). Chapter 14: Marine Ecology and Nature Conservation, Section 14.6 ('Operational Effects').

Impact	Potential effect on birds	Screened in/out?	Justification for screening	Chapter reference[1]
			significant effects on terrestrial habitats, hence there would be no indirect effect on birds. Appendix 8B (ES Volume III, Document Ref. 6.4) has assessed and confirmed that levels/loads of other relevant pollutants (NOx, ammonia and nutrient nitrogen) would not be exceeded at any other location, including other Designated Sites within the Study Area (See Table 15.5 of this chapter).	Chapter 12: Terrestrial Ecology and Nature Conservation, Section 9.6 ('Operation').
Discharges of heated process waters ("thermal plume") to the Tees Bay.	Localised decreases of dissolved oxygen within the subtidal environment affecting the distribution and abundance of fish stock on which marine birds rely as a foraging resource.	Out	Identified as not significant for intertidal or marine fauna, hence no effect on birds.	Chapter 14: Marine Ecology and Nature Conservation, Section 14.6 ('Operational Effects').
Chemical contamination of Tees Bay marine waters resulting from process wastewater discharges.	Direct toxicity to marine organisms, affecting distribution and abundance of foraging resources for birds that feed offshore.	Out	Controlled through impact avoidance measures embedded in design to achieve compliance with regulatory requirements.	Chapter 14: Marine Ecology and Nature Conservation, Section 14.6 ('Operational Effects').
Barrier effects of newly constructed tall structures within the Proposed Development.	Severance of flight lines between roosts, breeding sites and feeding areas resulting from the presence of PCC buildings.	Out	Highly unlikely to occur in the context of an environment in which there are numerous existing industrial buildings and flare stacks within the SSI former steelworks and Teesworks areas.	Chapter 4: The Proposed Development, Sections 4.2 ('Proposed Development') and 4.3 ('Components of the Proposed Development'). Habitats Regulations Assessment Report (Document Ref. 5.13)

[1]Chapters are held within ES Volume 1 Main Text (Document Ref. 6.2); Appendices are held within ES Volume III Appendices (Document Ref. 6.4).
[2]Framework Construction Environmental Management Plan (Appendix 5A, ES Volume III Document Ref. 6.4).

Construction of the PCC Site

15.6.11 The PCC Site occupies land totalling approximately 42.5 ha and will be served by the Teesworks temporary construction compound measuring around 40 ha immediately to the south. Construction within the PCC Site will involve site clearance, preparatory works (removal of existing buildings and infrastructure, foundation works, piling), construction, commissioning and reinstatement/replacement of habitats as set out in Section 12.8 of Chapter 12: Terrestrial Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2) over a 2-year period, affecting up to two breeding seasons and two non-breeding seasons. It is assumed the Site compound will be present for the duration of the entire construction phase, affecting up to four breeding seasons and four non-breeding seasons.

Habitat Loss and Degradation (Chapter 12: Terrestrial Ecology and Nature Conservation)

15.6.12 Removal of habitats to make way for construction will result in temporary habitat losses in areas that are used only for construction activities, and permanent habitat losses where the permanent infrastructure of the PCC Site is installed. The habitats affected include:

- semi-improved neutral grassland;
- bare ground;
- dense scrub (excluding scattered bushes within grassland habitats);
- ephemeral/short perennial vegetation;
- hard standing; and
- at least eight individual buildings or other disused industrial structures, all of which will be permanently removed.

15.6.13 The only permanent habitat losses within the PCC Site are up to 17.3 ha of semi-improved neutral grassland. The details set out in the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12) confirm that sufficient good quality new grassland will be provided within the PCC Site after construction to compensate for the grassland habitat permanently lost during construction of the PCC Site in a manner suitable to achieve a net gain for biodiversity (see Indicative Landscape and Biodiversity Strategy, Document Ref. 5.12). Other permanent habitat losses include small fragmented areas of several habitats that, while of low intrinsic value, collectively provide nesting opportunities for breeding birds. These include bare ground, ephemeral/short perennial and buildings. The species of greatest conservation value were recorded breeding within the area on which permanent infrastructure will be built, including a block of low-growing grassland, bare ground and ephemeral vegetation adjacent to South Gare Road in the northernmost extent of the PCC Site, and the existing industrial buildings. These would be subject to permanent habitat losses. South of this area, the majority of breeding species were recorded within scrub within the temporary laydown area and would not be subject to permanent habitat losses.

15.6.14 Consequently, permanent habitat losses are predicted to result in the following impacts:

- Loss of one breeding site for a single pair of little ringed plover (County importance). Suitable breeding habitat typically occurs on sparsely vegetated and bare ground with a substrate of shingle or pebbles and in the vicinity of open waters, mud flats and sand banks on coasts and at inland wetlands. Given the presence of similar habitat within and adjacent to the former Redcar Steelworks, this is not significant (minor adverse);
- Loss of up to two breeding/roosting sites, which will affect one pair of breeding and roosting barn owl (Borough importance). Given that this affects some (rather than all) of the recently occupied breeding and roosting sites and does not sever breeding/roost sites from foraging habitats, there is no reason to believe that the local landscape cannot continue to support a single pair of barn owl. Measures to replace roost and breeding sites lost are addressed in the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12) in order to maintain the long term viability of the local barn owl population. Consequently, this is not significant (minor adverse); and
- Loss of a breeding bird assemblage that includes small numbers of lapwing, herring gull, skylark and meadow pipit, which is assessed as not significant (minor adverse) given the small scale of the impact.

15.6.15 Up to 25.9 ha of bare ground and 12.2 ha of semi-improved neutral (secondary) grassland will be temporarily lost, and small stands of scrub (up to 1.7 ha) will be permanently lost within the Teesworks temporary laydown. The Applicants do not have control over the Teesworks Construction and Laydown Area, therefore no scrub replanting is proposed at the location of its original loss, however new scrub plantings will be provided within the PCC Site as part of the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12). All temporary losses of grassland resulting from the temporary construction laydown will be reinstated as per the narrative in Sections 12.6 and 12.7 of Chapter 12: Terrestrial Ecology (ES Volume I, Document Ref. 6.2) and the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12). These habitats collectively are used regularly by feeding/roosting herring gull and a small number of breeding birds including one breeding pair of song thrush and small numbers of green list species such as wren and whitethroat. The bare ground habitat resource performs a minor supporting function to the SSSI and SPA as an area used regularly by relatively small numbers of gulls, however the temporary loss of this area as a resource for these species would not conceivably compromise the integrity or function of these sites in the context of the known distribution of gulls across the wider set of habitats across Teesside and the much larger expanses of bare ground that will be unaffected by the Proposed Development between the laydown area and the River Tees. This area is therefore regarded as being of local importance to birds and the temporary nature of the habitat “loss” at this location can be regarded as not significant (neutral) for the notified features of the Teesmouth and Cleveland Coast SPA and SSSI and for the breeding bird assemblage.

Noise and Vibration

15.6.16 Noise and vibration impacts can arise from construction activities and construction traffic. These have been modelled and assessed in detail in Section 11.6 of Chapter 11: Noise and Vibration (ES Volume I, Document Ref. 6.2), and noise contour plans have been produced for construction of the PCC Site. Non-percussive bored piling has been confirmed as the most likely piling method and therefore noise contours have been generated for continuous noise emissions measured as L_{Aeq} based on the full piling plant i.e. piling rigs plus all associated plant) as a worst-case scenario (Section 11.6, Chapter 11: Noise and Vibration, ES Volume I, Document Ref. 6.2). Noise contour plans for this activity are shown on Figure 11-2: PCC Site Piling Construction Phase (ES Volume II, Document Ref. 6.3).

15.6.17 The degree of impact that varying levels of noise would have on different species of bird is relatively poorly understood. Research published by the Institute of Estuarine & Coastal Studies in 2013 (Institute of Estuarine and Coastal Studies, 2013) summarises the key evidence base relating to this impact pathway. Based on the observed responses of waterbirds to noise stimuli, an acceptable receptor dose (i.e. maximum noise level at the bird) of 69 dB (A-weighted) was identified by the authors in discussion with Natural England on schemes in other parts of England.

15.6.18 Natural England has agreed an upper noise limit of 70 dB at the receptor (paragraph 15.3.34) for noise disturbance to be considered significant such that it would elicit behavioural responses in birds that would fundamentally alter distribution, behaviour and habitat use. It is assumed for the purposes of assessment that birds can habituate to sound levels lower than 70 dB.

15.6.19 Winter daytime and night-time sound measurements of L_{Aeq} (which provides information on the average sound) and L_{AFmax} (which provides information on sudden, peak sound events) were taken at a number of locations near the Site (see Chapter 11: Noise and Vibration, Section 11.4 (ES Volume I, Document Ref. 6.2). Location E3 is within Coatham Dunes, NSR4 and M3 are on Tod Point Road adjacent to the SSSI and E4 is at Bran Sands. AECOM then modelled noise contours for and L_{Aeq} arising from bored piling.

15.6.20 The baseline sound measurements for the Site show that at location E3 within Coatham Dunes birds are subjected to daytime sound levels of 59 dB L_{AFmax}, 46 dB L_{Aeq} and 43 dB L_{Aeq} at night arising largely from existing industry. At Tod Point Road adjacent to the SPA, the equivalent sound levels are 81 dB, 56 dB and 47 dB respectively. These are taken to be representative of the baseline within Coatham Dunes and the wider environs to the east and south of PCC site respectively. Within the wider environment of Teesside the baseline sound profile is represented by a combination of road traffic, domestic sound emissions and in most locations there is a strong contribution of industrial sound to the overall soundscape (refer to Chapter 11: Noise and Vibration, ES Volume I, Document Ref. 6.2). Within Coatham Dunes and Coatham Sands, the soundscape is described as including “waves, road traffic, distant industry and birds”. At Tod Point Road, the baseline soundscape is characterised by significant sound inputs from industrial activity, some sound from daytime construction works. At Bran Sands, sound emissions from port activities including moving plant, reverse

alarms and loading/unloading of ships. The data presented here and in Chapter 11: Noise and Vibration (ES Volume I, Document Ref. 6.2) indicate that the existing sound environment is very variable: average sound levels are not particularly high, but within a representative 15-minute period, very high baseline sound levels are experienced. This strongly suggests that birds in this area are exposed to (and thus likely to be habituated to) a highly variable sound environment with a significant impulsive sound element including a variety of industrial sound emissions that at Tod Point Road was measured to have L_{AFmax} levels well above the 70 dB noise disturbance threshold agreed by Natural England.

15.6.21 The 70 dB noise contour arising from construction of the PCC, maps almost exactly to the boundary of the PCC Site, affecting a negligible area of Coatham Dunes immediately adjacent to South Gare Road, beyond which noise levels fall away sharply. An area (approximately 2.5 ha) of semi-natural habitat immediately east and south of the PCC Site that is partially occupied by roads and existing industrial infrastructure lies within the 70 dB L_{Aeq} contour. The entire area of Coatham Sands, Bran Sands and almost all terrestrial habitats south and east of the PCC Site lie outside of the 70 dB L_{Aeq} contour. Noise levels of 65-70 dB occur across approximately 5 ha of Coatham Dunes close to the PCC, including a part of one of the ponds used as a roost by very small numbers of birds for which Teesmouth and Cleveland Coast SPA is notified (maximum counts of 5 redshank and 12 lapwing were recorded at a dune pond within this noise contour). This is approximately 20dB above background L_{Aeq} noise levels and 5-10 dB above baseline L_{AFmax} sound levels at this location and might elicit minor behavioural responses for some breeding bird species within a small proportion of Coatham Dunes and in small numbers of roosting redshank and lapwing. The Habitats Regulations Assessment Report (Document Ref. 5.13) demonstrates that the level of impact on birds for which Teesmouth and Cleveland Coast SPA and Ramsar are notified will be below detectable levels and not significant. Furthermore, the proportion of Coatham Dunes that is affected is an insignificant proportion of the SPA and SSSI as a whole, noise levels of 20 dB above background levels would affect a small proportion of the dune system within which a breeding bird population has been identified, and the impact is temporary and reversible. Within the non-designated environment to the east and south of the PCC baseline noise levels are relatively high, therefore birds using these habitats will be habituated to high noise levels.

15.6.22 The impacts of noise emissions during construction of the PCC Site will have a negligible effect on birds that is not significant (neutral) for all ornithological receptors[8].

[8] The assessment of impact significance for the purposes of EcIA is distinct from the assessment of significant effects on designated sites for the purposes of the Habitats Regulations Assessment (HRA) process. The HRA (Document Ref. 5.13) must determine whether or not the integrity of the designated site is adversely affected such that there is an effect on the coherence of its ecological function and structure across its *whole area*, that enables it to sustain the populations of the species for which it is designated. An effect that is temporary and/or barely detectable on a population of a species and/or that affects a tiny proportion of a designated site can still result in a significant effect on integrity and function of the designated site in HRA terms. Section 6.1 of the Habitats Regulations Assessment Report (Document Ref. 5.13) identifies this potential impact as not significant on Teesmouth and Cleveland Coast SPA, however Vantage Point watches are prescribed for any piling work during November – March as a precautionary measure to monitor avian responses to potential noise impacts within Coatham Dunes for the purposes of maintaining integrity and function of Teesmouth and Cleveland Coast SPA and Ramsar.

Visual Disturbance

15.6.23 The presence of site staff, construction activities, lighting and vehicle movements can cause displacement of birds from habitats used for breeding, roosting and feeding. Visual disturbance from construction of the PCC Site is not expected within the Teesmouth and Cleveland Coast SSSI and SPA because of the screening afforded by existing buildings and the natural topography of the sand dune system interrupting line of sight to the PCC Site. Therefore, there will be a negligible impact on the species within Coatham Dunes and Coatham Sands for which the SPA and SSSI are designated and this effect is not significant (neutral).

15.6.24 The PCC Site is separated from open habitats to the east, south-east and south-west by existing industrial infrastructure including pipe racking, buildings transport infrastructure such as railways. The PCC Site is within an already industrialised landscape characterised by artificial lighting. A commitment has been made within Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2) to provide a sensitive external lighting scheme taking account of a range of considerations including requirements of nocturnal species such as bats, and this will serve to reduce the potential effects on birds in the immediate vicinity of the working areas. Therefore, there the potential effects of lighting on birds are assessed as not significant (neutral).

15.6.25 Visual disturbance of breeding and roosting barn owl is highly unlikely to occur because the pump house building provides adequate visual screening from the surrounding landscape. It is not at or close to a location that will require artificial lighting and therefore barn owls leaving and returning to the nest site to provision young during the breeding season are unlikely to be disturbed. Given the narrative above, the effect of visual disturbance on breeding and roosting barn owl is assessed as not significant (neutral).

Construction of the Water Connection Corridors and CO_2 Export Pipeline

15.6.26 Construction of the Water Supply Connection of the PCC Site will involve use of the existing NWL water connection. This will not have significant impacts on birds within terrestrial habitats since it will construction of a connection to existing infrastructure therefore this impact is not considered further.

15.6.27 The Water Discharge Connection will either use the existing outfall from the former Redcar steelworks (within the western water discharge corridor), which may require some minor refurbishment works, or construction of a new outfall within the same corridor as the CO_2 Export Pipeline as shown on ES Figure 3-2A (ES Volume II, Document Ref. 6.3), using a MBT. If it is possible to re-use the existing tunnel, any maintenance activities are likely to be minor resulting in no significant impacts on ornithological receptors. The construction of the CO_2 Export Pipeline will involve HDD.

15.6.28 Both the MBT and HDD installation methods would require launch pits if drilled from onshore to offshore (which is the assumed worst-case scenario for HDD). Further, as a worst case, is it assumed that the launch pit will be adjacent to the northern boundary of the PCC Site and therefore very close to the boundary of Teesmouth and Cleveland Coast SPA, Ramsar and SSSI.

15.6.29 The methods described above will require no plant, vehicles, machinery or excavations within the dunes and foreshore. Tracking and directing of a pilot bore beneath the dunes will be required in order to ensure that the HDD/ MBTs are working correctly; this will require an operative to walk directly above the drill head with a handheld receiving unit that transmits information to the drill head. Assent from Natural England will be required for works within the SSSI, but there will otherwise be no adverse effects on birds within Coatham Dunes or Coatham Sands as this operation will cause negligible levels physical disturbance. There will therefore be no habitat losses and no direct physical disturbance of birds using these habitats and these impacts are not considered further.

Noise and Vibration

15.6.30 There is no percussive element to MBT and HDD works, thus noise modelling is based only on L_{Aeq} data. However baseline noise measurements detected percussive noise emissions of up to 59dB L_{Amax} within Coatham Dunes and this is considered when assessing the impacts of noise emissions from MBT and HDD processes.

15.6.31 Noise modelling was carried out both with and without the inclusion of a noise barrier (Tables 15-7 and 15-8), the latter being shown as noise distance bands on Figure 11-4B (ES Volume II, Document Ref. 6.3). Noise thresholds are expressed within distance bands from the launch pit location with reference to significance criteria related to baseline noise levels, agreed noise significance thresholds and locations of ornithological significance to the function of designated sites and/or the wider ornithological baseline. Ponds 13 and 14 (see Figure 13-1, ES Volume II, Document Ref. 6.3) represent respectively the two closest locations within Teesmouth and Cleveland Coast Ramsar, SPA and SSSI that were recorded as regularly used by features (species) for which the designated sites are notified.

Table 15-7: HDD with no noise barrier

Distance from edge of construction area (m)	Level $L_{Aeq,T}$ (dB)	Significance
65	69	Natural England Receptor Value for impacts on SPA birds
100	65	At pond 13 within SPA and SSSI (lapwing and redshank)
150	61	At pond 14 within SPA and SSSI (lapwing and redshank).
190	58	10 dB above Bran Sands measured daytime $L_{Aeq,T.}$ 1 dB lower than measured L_{Amax} for Coatham Dunes. Approximately equal to daytime $L_{Aeq,T}$ for terrestrial habitats south and east of the drill sites
270	55	10 dB above Coatham measured daytime $L_{Aeq,T.}$ Approximately equal to daytime $L_{Aeq,T}$ for terrestrial habitats south and east of the drill sites
525	48	Equal to Bran Sands measured daytime $L_{Aeq,T;}$ Lower than daytime $L_{Aeq,T}$ for terrestrial habitats south and east of the drill sites

Distance from edge of construction area (m)	Level $L_{Aeq,T}$ (dB)	Significance
675	45	Equal to Coatham measured daytime $L_{Aeq,T}$

Table 15-8: HDD with fully screening barrier

Distance from edge of construction area (m)	Level $L_{Aeq,T}$ (dB)	Significance
24	69	Natural England Receptor Value
90	58	10 dB above Bran Sands measured daytime $L_{Aeq,T.}$ 1 dB below meaured L_{Amax} for Coatham Sands
100	57	At pond 13. Approximately equal to daytime $L_{Aeq,T}$ for terrestrial habitats south and east of the drill sites
130	55	10 dB above Coatham measured daytime $L_{Aeq,T.}$ Lower than daytime $L_{Aeq,T}$ for terrestrial habitats south and east of the drill sites
150	54	At pond 14.
290	48	Equal to Bran Sands measured daytime $L_{Aeq,T.}$
425	45	Equal to Coatham measured daytime $L_{Aeq,T.}$

15.6.32 The Habitats Regulations Assessment Report (Document Ref. 5.13) demonstrates that there will be no adverse effect on the integrity and function off the Teesmouth and Cleveland Coast SPA and Ramsar site during installation of the CO_2 Export Pipeline and Water Discharge[9], because:

- The nearest pool (pool 13), approximately 100m from the nearest point of the HDD/MBT works, is significantly overgrown and relatively unattractive to species for which the SPA and Ramsar site are notified;
- The nearest pool (14) with open habitat suitable for SPA and Ramsar species is 150m from the closest part of the HDD/MBT works. The predicted noise levels at these locations would be below 70dB and, with the inclusion of a noise barrier, would be no higher than 54dB;
- Across all other parts of the SPA, Ramsar (and SSSI) predicted noise levels will be below 70dB.

15.6.33 Other than redshank, there has been no recorded significant regular use of the habitats within Coatham Dunes by notified species for which Teesmouth and Cleveland Coast SSSI is designated and therefore no significant adverse effects will occur on the SSSI. The proportion of Coatham Dunes that is affected by noise levels that exceed baseline levels is a small proportion of the habitat type within the SPA and SSSI as a whole: Noise levels above measured baseline levels would affect a small proportion of the dune system within which a breeding bird population has been recorded and a smaller

[9] Section 6.1 of the Habitats Regulations Assessment Report (Document Ref. 5.13) identifies this potential impact as not significant on Teesmouth and Cleveland Coast SPA, however Vantage Point watches are prescribed for any piling work during November – March as a precautionary measure to monitor avian responses to potential noise impacts within Coatham Dunes when the dune pools are most likely to be occupied by roosting or loafing redshank. This measure is designed primarily to serve the purposes of maintaining integrity and function of the designated sites and targets a narrow range of species (principally waders).

proportion still of the dune habitat available within the SSSI (184.8ha); that population is habituated to daytime percussive noise emissions, within an otherwise fairly quiet environment, that exceed those predicted for HDD and MBT activities across most of the dune system (see paragraph 15.6.21); and the impact is temporary and reversible. In the context of relatively high baseline noise levels within the non-designated environment to the east and south of the PCC Site, the contribution of noise from MBT and HDD operations will be minimal and birds using these habitats will be habituated to fairly high baseline noise levels.

15.6.34 The impacts of noise emissions on ornithological receptors during installation of the water discharge and CO_2 Export Pipeline is therefore assessed as not significant (neutral) for designated sites, species and species assemblages.

Disturbance of marine birds arising from presence of work boats and/or barges

15.6.35 The installation of a new water discharge point or refurbishment of an existing water discharge point on the seabed within the Tees Bay will be carried out by drilling a MBT from the PCC Site to the discharge point within Tees Bay. This will require the presence of staffed jack up barges or anchored vessels to enable works at the offshore location of the water discharge point, for a period of up to one year.

15.6.36 The exact working area that will be occupied by the vessel or vessels is not currently available, however since the work is focused on a single point it will occupy a small footprint relative to a working construction corridor. This will be an insignificant proportion of the marine habitat for which Teesmouth and Cleveland Coast SPA is designated, and the impact will occur for a limited time (one year at most).

15.6.37 This activity will occur exclusively offshore below MLWS, therefore there will be no impacts on shorebirds or terrestrial birds. Any species that feed or otherwise occur exclusively or predominantly offshore (including little tern, common tern, sandwich tern, cormorant and “fishing” birds such as divers, grebes and mergansers) would be deterred from foraging in the vicinity of these locations for short periods of time due to the presence of the construction equipment, construction staff, barges, boats and other machinery. A series of boat-based surveys carried out to track terns as part of a habitat use and foraging range verification survey (Natural England, 2018b) used minimum standoff distances for observation vessels of 50 m from terns in flight over open water. Applying this minimum distance around the discharge point location derives an area of open water respectively measuring approximately 2 ha and 500 m^2, which is insignificant in the context of the SPA and the wider availability of such habitat across Teesside, and the short duration of the impact. The presence of boats and barges at the discharge and abstraction locations would not materially alter the behaviour or distribution of foraging terns or other fishing birds and therefore this is assessed as not significant (neutral).

Construction of the Natural Gas, Electrical Connection and CO_2 Gathering Network Corridors

15.6.38 This section assesses the potential impacts of installation of Natural Gas Connection, Electrical Connection and CO_2 Gathering Network and includes the establishment and use of the laydown areas, site compounds and welfare areas required to support the construction phase.

15.6.39 The construction phase will require a number of separate construction compounds/laydown areas and a site welfare facility. These are summarised in Table 15-9. As a worst case, it is assumed that these compounds will be required for the duration of the construction phase of the entirety of the Proposed Development (up to 4 years).

15.6.40 Access to the connection corridors for construction purposes will be by existing roads and service tracks. The majority of proposed connection infrastructure will use existing or upgrade pipe racking and/or and trenchless technologies to install new underground infrastructure. The Electrical Connection will be buried. Thus, there will be no requirement for new above-ground infrastructure for any part of:

- The Electrical Connection;
- The connections across the River Tees (CO2 Gathering Network and the Natural Gas Connection);
- The CO2 Gathering Network north of the River Tees; and
- The connections across the former Redcar Steelworks between the PCC Site and the River Tees.

15.6.41 The Natural Gas Connection corridor between Navigator Terminal laydown area and the western end of Seal Sands Industrial Estate will require new pipework to be installed, however regardless of the installation method this will be installed alongside the A1185 Seaton Carew Road within a 35 m wide working corridor and through an area characterised in the main by existing industrial infrastructure. The footprint of the working area here overlaps small areas of roadside semi-improved grasslands and very small areas of scrub that are suboptimal for birds, therefore habitat losses in these areas will not result in a significant effect on birds.

15.6.42 New pipework will be required to accommodate part of the CO_2 Gathering Network and Natural Gas Connection corridors east and south of the PCC Site. In the same area the Electrical Connection will be installed underground between the PCC Site and Tod Point electricity substation, potentially requiring topsoil stripping, excavation of trenches, installation of new cable and backfilling of trenches and resulting in temporary habitat losses and disturbance. The connection corridors in this location lie mostly between existing industrial and utilities infrastructure and the habitats affected are mostly, but not exclusively, suboptimal for birds as a result of this. In the case of the CO_2 Gathering Network and Natural Gas Connection corridors in this area, the existing infrastructure will provide a degree of visual screening between working areas and habitats used by birds, especially south of the PCC Site.

15.6.43 Semi-natural habitats (including bare ground) will be rendered unavailable to birds within laydown/welfare and construction compounds for the duration of the construction period due to Earthworks and site clearance; Laying of parking areas; Installation of site offices, storage areas/buildings and welfare facilities; and installation of construction infrastructure such as direct drilling rigs at the following locations where semi-natural habitats (including bare ground):

- Teesworks laydown;
- Navigator Terminals;
- Saltholme laydown and access; and
- Haverton Hill laydown/welfare.

15.6.44 Noise emissions during construction of the connection corridors will mostly occur as a result of non-percussive activities including pipe stringing, pipe bending, direct drilling, pipe laying and welding. Noise outputs have therefore been modelled using L_{Aeq} values. The 70 dB noise response threshold for birds is exceeded only within 50 m of all parts of the connection corridor network as shown on Figure 11-3 (ES Volume II, Document Ref. 6.3).

15.6.45 Based on the narrative above, only the following impacts have the potential for significant effects on ornithological receptors and are assessed below:

- Temporary habitat losses at the four site compounds/laydown areas identified above, and within the Electrical Connection corridor. The effects of habitat loss at the Teesworks compound have been assessed in paragraphs 15.6.12 – 15.6.15 as these are linked to the construction of the PCC Site; and
- Noise and visual disturbance throughout the CO_2 Gathering Network, Natural Gas and Electrical Connection corridors.

Table 15-9: Summary details of Construction Compounds/Laydown and Welfare Areas

Site Compound/Laydown Area	Description	Central Grid Reference	Area (ha)	Habitats	Surveyed for birds?
Teesworks Laydown	Main area immediately to the south of the PCC Site. Additional strip of land at northern end of PCC Site.	NZ5674 2502 NZ5682 2567	49.38	• Semi-improved neutral grassland; • Dense scrub; • Bare Ground; • Hard Standing; and • Buildings.	In 2020
Navigator Terminal	On the north bank of the River Tees opposite Dabholm Gut.	NZ5418 2462	10.87	• Semi-improved neutral grassland.	No
INEOS laydown	Immediately South of Seaton Carew Road. Includes an internal access road to the CO_2 Gathering Network, using an existing trackway.	NZ5244 2404	0.98	• Hard standing.	No
Saltholme Welfare	Adjacent to Seaton Carew Road	NZ5068 2394	0.91	• Hard standing	No
Saltholme Laydown and Access	Adjacent to Saltholme electricity substation immediately south of the A185 Saltholme Road	NZ4649 2366	1.57	• Semi-improved neutral grassland; • Broadleaved semi-natural woodland; and • Improved grassland.	In 2018
Haverton Hill Laydown/Welfare	Immediately to the west of Saltholme RSPB Reserve and southeast of Belasis Technology Park	NZ4834 2310	3.22	• Improved grassland; • Poor semi-improved grassland; • Broadleaved semi-natural woodland; • Dense scrub; and • Standing water.	In 2020

Habitat Losses

15.6.46 Approximately 9.7 ha of semi-improved neutral grassland will be lost within Navigator Terminals laydown. This land was not accessible for surveys, nor do any of the third-party data include records for this location. The habitats available would be suitable for a number of ground-nesting birds of principal importance such as skylark, lapwing and meadow pipit. The area might also provide a feeding or high tide roosting resource for wading birds such as oystercatcher and gulls. However, despite its location adjacent to the River Tees it is not part of the Tees Estuary WeBS count area nor is it identified as important for birds in Natural England's information supporting the renotification of the SPA and SSSI[10]. Furthermore, this area is subject to high baseline levels of noise – daytime background noise levels have been measured at 68 dB L_{Aeq} with peaks of 83 dB L_{AFmax}. For these reasons the location of Navigator Terminal is suboptimal for birds and it is assumed that this land would be used no more than occasionally by such species and therefore it would not play any more than a minor role in the function and integrity of the designated sites. The potential effects of temporary and reversible loss of grassland habitat on a breeding assemblage of ground-nesting species and on roosting/feeding species that are notified features of Cleveland and Teesmouth Coast SPA and SSSI at this location is cautiously assessed not significant (minor adverse).

15.6.47 Two hectares of semi-improved neutral grassland and a similar area of improved grassland will be lost from Saltholme laydown and access area, which supports a small assemblage of breeding birds that is of local value. While the grasslands here are recorded by Natural England as coastal and floodplain grazing marsh, the areas of such habitat immediately adjacent to and within the proposed laydown area that might attract water birds are limited by the presence of Saltholme electricity substation, existing pipe racking and the A1185 main road. Uninterrupted expanses of such habitat are found in the wider area north of the A1185 and south within the Saltholme RSPB reserve and it is these areas that are known to attract large numbers of water birds including species for which the SPA and SSSI are notified. The temporary losses for semi-improved grassland described above will not have any detectable long-term effects on the use of the habitats at this location by breeding birds, the majority of which occur within the adjacent woodland habitat to the west. This is therefore assessed as not significant (neutral).

15.6.48 Haverton Hill laydown will cover approximately 0.5 ha and 3 ha of improved grassland and poor semi-improved grassland respectively between the B1275 Belasis Road and Belasis Hall Technology Park. An area of such habitat measuring 17.3 ha, 1.4 ha of which includes the proposed laydown area, was surveyed for breeding birds. A small breeding bird assemblage of local importance, comprising mostly ground and-scrub nesting birds, was recorded here. The temporary, small scale and reversible impacts of habitat loss on breeding birds at this location will be not significant (neutral).

15.6.49 The Electrical Connection corridor east and south of the PCC Site is 1.6 km long and 580 m wide at its widest point, however the working width of the installation corridor would be no more than 35 m. The area of habitat affected

[10] Teesmouth and Cleveland Coast SPA, Ramsar and SSSI consultation feedback (https://consult.defra.gov.uk/natural-england-marine/teesmouth-and-cleveland-coast-potential-sp/, accessed January 2021)

would therefore be approximately 5.6 ha of semi-improved neutral grassland punctuated by small areas of perennial/ short-ephemeral habitat, with occasional open waters (The Fleet and a small pond close to the NWL sewage treatment works). The CO_2 Gathering Network and Natural Gas Connection corridors occupy a smaller footprint within this area, however the working width for installation of this infrastructure, and the habitats affected, would be almost identical. Adjacent to the sewage treatment works and the former Redcar Steelworks, the habitats are intersected by access roads, railway lines and existing pipe racking, making them suboptimal for birds due to habitat severance and interruption of sight lines at ground level. Indeed, breeding behaviours were recorded only for whitethroat, lesser whitethroat and willow warbler within the connection corridors. Therefore, habitat losses are assessed as not significant (neutral) for the locally important breeding bird assemblage east and south of the PCC Site.

15.6.50 The only use of habitat by wetland birds within the connection corridors occurred adjacent to the Fleet where teal were recorded, and within the southern end of the electrical connection corridor, where lapwing, teal and shelduck were recorded during high tide counts. However only lapwing occurred in sufficient numbers and with enough regularity (peak count 172, recorded on six high tide surveys) for this habitat to be regarded as a key resource for this species within the ZoI of the Proposed Development. This species can be considered a component of the waterbird assemblage feature for which Teesmouth and Cleveland Coast SPA is notified. The impact of habitat losses would depend on how the Electrical Connection is routed within the broader connection corridor; in theory it is possible to route the Electrical Connection such that it avoids the areas used by lapwing. However, making a worst-case assumption that habitat used by this species is directly affected by habitat losses, considered against the value of the receptor and the temporary and reversible nature of the habitat loss, the impact on Teesmouth and Cleveland Coast SPA would result in a minor adverse effect (not significant).

15.6.51 There will be no other habitat losses significant to ornithological receptors as a result of construction of the connections. It is assumed for the purposes of this assessment that the pump house south of the PCC Site and on the periphery of the connection corridors, which is used by breeding and roosting barn owl, will be retained, therefore there will be no impact of habitat losses on this species and any temporary losses of terrestrial habitat used for feeding will be negligible in the context of the wider availability of habitats over which the species is known to feed, including the grasslands at Coatham Dunes and Coatham Marsh.

Noise and visual disturbance

15.6.52 Noise predictions indicate that the bird response threshold of 70 dB will be experienced within 50 m of the construction corridors (Figure 11-3, ES Volume II, Document Ref. 6.3). The majority of the habitat subject to this level of noise is characterised by improved grassland, poor semi-improved grassland and semi-improved neutral grassland between land under industrial use, existing access routes, public roads, buildings and hard standing. Semi-natural habitat within 50 m of infrastructure would therefore be suboptimal for the majority of birds due to baseline levels of noise, vehicle

movements and the presence of existing infrastructure, which serves to fragment and sever semi-natural habitats and interrupt sightlines. As noted above, little regular breeding bird activity was recorded within the connection corridors east and south of the PCC Site for these reasons. Noise levels above 70 dB would affect only around 20% of the remainder of the breeding bird assemblage here, on a short-term basis. The temporary and short-lived impacts of noise and visual disturbance resulting from construction of the connection corridors and installation of laydown areas are assessed as not significant (minor adverse) for terrestrial breeding birds.

15.6.53 The 70 dB noise threshold will be exceeded for small areas of terrestrial habitat south of the PCC Site that are used as high tide roosts by lapwing. The relatively small area of habitat affected and the short-term nature of the construction activity is highly unlikely to alter the use of this area by this species to the extent that there would be a detectable adverse impact on the function and integrity of Teesmouth and Cleveland Coast SPA. Therefore, this impact is assessed as not significant (minor adverse).

15.6.54 Barn owls breeding and roosting within the Survey Area but outside of the Proposed Development area (see Appendix 15B: Confidential Ornithology Baseline Report, ES Volume III, Document Ref. 6.4 for details of breeding and roosting locations) will be largely resistant to noise and visual disturbance for the reasons set out above, assuming that the nest site is retained within the landscape. Therefore, there will be no impact on this receptor.

15.6.55 Noise and vibration from construction traffic are predicted to cause either no change or a very low change in road traffic noise above baseline levels due to traffic flows along the construction traffic routes of the Proposed Development (Section 11.5, Chapter 11: Noise and Vibration, ES Volume I, Document Ref. 6.2), therefore the effects of construction traffic noise on ornithological receptors are assessed as not significant (neutral).

15.6.56 The impact of visual disturbance North of the River Tees will be limited because the working areas are restricted in size and are mostly within or close to locations already under industrial use. Furthermore, their visual separation from most of the surrounding semi-natural habitats by existing infrastructure, and spatial separation from regularly used roosts and colonial breeding sites used by notified ornithological interest features of the SPA and SSSI will further limit any effects on ornithological receptors. Construction along the northern edge of Saltholme RSPB Reserve will be restricted to works on the existing pipe racking and access track immediately alongside it, south of which lies a band of improved grassland approximately 100 m wide that is suboptimal for breeding birds (as per a consultation meeting with RSPB on 8th February 2021; see paragraph 15.3.35 and Table 15-4). South of this a band of dense scrub screens much of the important wetland further south from the A1185 and this would provide effective visual screening from the Proposed Development over a distance of approximately 1 km. North of the working area, the A1185 provides a degree of visual screening between the proposed connection corridor and the North Tees Marshes. The closest species receptor of greater than local value is breeding marsh harrier (National Value), located a minimum of 200 m south of the western end of the CO_2 Gathering Network.

15.6.57 For the reasons outlined above, visual disturbance on all ornithological receptors during construction north of the River Tees is assessed as not significant (neutral).

Operation of the PCC Site

15.6.58 Operation of the PCC Site will have the following potentially significant effects on ornithological receptors:

- Localised process noise emissions from operational infrastructure; and
- Localised visual disturbance of birds arising from operation and lighting of the proposed infrastructure.

15.6.59 Air quality emissions generally do not have direct impacts on birds, however the effects on habitats of such emissions can be used as a suitable proxy for effects on birds as the stimulation of vegetation growth can render habitats unsuitable for nesting and/or foraging. Based on the results of the operational air quality impact assessment (Appendix 8B, ES Volume III, Document Ref. 6.4) detailed assessment of the potential air quality impacts on habitats within Teesmouth and Cleveland Coast SSSI is provided in Section 12.6 of Chapter 12: Terrestrial Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2), which focuses in particular on a small area of Coatham Dunes where modelled deposition rates are at their highest. The impact on habitats here is assessed as not significant (neutral) and therefore by default there will be no significant effects on birds.

15.6.60 Air quality impacts to ornithological receptors at other locations within the Study Area are not considered further because:

- species with sole dependency on marine (sub-tidal habitats), intertidal habitats that are subject to regular tidal washing or mass dilution (including marine waters below MLWS; and intertidal habitats) and/or that roost on artificial structures, tidal foreshore and rocky shores would not be affected. Thus, there will be no impact on the foraging and roosting habitats of sanderling, purple sandpiper, dunlin and knot; and there will be no impact on the foraging habitats of little tern, common tern, sandwich tern. There will be no impact on any species that feed exclusively within marine habitats (such as terns or divers); and
- the deposition rates at all locations north of the River Tees and locations south of the River Tees outside of Coatham Dunes will be imperceptibly low and of no significance to ornithological receptors regardless of habitat.

15.6.61 Therefore, there will be no air quality impacts on any ornithological receptors and this potential impact will not be considered further in this chapter.

Noise and vibration

15.6.62 Operational noise levels from CO_2 compression and operational plant will produce a worst-case unmitigated sound level of 85 dB 1m from source, however this falls away to a minimum of 55 dB L_{Aeq} within the footprint of the PCC Site, between 45 and 55 dB L_{Aeq} within Coatham Dunes and between 35 and 45 dB L_{Aeq} across the brownfield land to the east and south of the PCC Site. These noise levels are comparable to or lower than existing

baseline sound measurements from various locations in the environs of the PCC Site and well below the noise response threshold of 70 dB, therefore it can be concluded that there will be no effects on the behaviour or distribution of birds as a result of noise emissions from the operational PCC Site. This is therefore assessed as not significant (neutral).

Visual disturbance

15.6.63 Once operational, the PCC has the potential to interact with ornithological receptors principally through artificial lighting. If there is significant light spill onto adjacent habitats this could affect birds that breed and roost within Coatham Dunes and the grasslands immediately to the east of the PCC Site.

15.6.64 The PCC Site is an existing industrial site within a wider landscape that is both heavily industrialised and urbanised, so is already subject to operational lighting and visual disturbance from adjacent infrastructure as well as background glow from domestic lighting, therefore some degree of habituation of birds to artificial lighting is expected within the local environment.

15.6.65 An Indicative Lighting Strategy is included in the Application (Document Ref. 5.11) and a commitment has been made within Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2), to provide an external lighting scheme taking account of a range of considerations including requirements of nocturnal species, the provisions of which can be adapted to consider the needs of birds as well as other nocturnal species such as bats. Visual disturbance of ornithological receptors is therefore unlikely to result in any detectable adverse effect on their behaviour or distribution and this impact is assessed as not significant (neutral).

Operation of Connection Infrastructure

15.6.66 The connection infrastructure (Gas, Electrical and Water) will be either beneath ground or mounted on existing pipe racks. Except for occasional maintenance activities of short duration there will be no lighting, disturbance, noise or vibration impacts associated with its operation, nor will there be any hydrological, surface water runoff, water quality or disturbance effects. The connection infrastructure will not present any habitat severance, permanent land take or barriers to movement of species that are not already presented by existing infrastructure, access routes or public roads.

15.6.67 All potential effects on water quality will be controlled adequately through embedded mitigation and design. These measures are described in detail in Section 9.7 of Chapter 9: Surface Water, Flood Risk and Water Resources and Section 14.7 of Chapter 14: Marine Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2).

15.6.68 Section 14.6 of Chapter 14: Marine Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2) has concluded no significant effects on marine organisms as a result of the potential impacts of wastewater discharges (from either of the discharge points under consideration) on fish, benthic organisms and diving birds resulting from increases in water turbidity (sediment plumes), discharges of heated water (thermal plume) and contaminants arising from process contributions. Therefore, these potential operational effects would have no impacts on ornithological receptors and are not considered further.

Decommissioning

15.6.69 The potential for adverse decommissioning impacts and effects on relevant ornithological receptors is limited by the nature of the proposed decommissioning activities. Decommissioning will remove all above ground infrastructure, but buried pipelines, cables and other infrastructure will be left in situ. Therefore, there will be no requirement to remove or disturb habitats to remove buried infrastructure. This will avoid direct impacts on the sand dune system of Teesmouth and Cleveland Coast SSSI, the foreshore and marine subtidal habitats of Coatham Sands. Decommissioning will therefore not affect any bird species breeding, feeding or roosting at Coatham Dunes, Coatham Sands, Bran Sands or the Tees Bay, nor will it affect species that forage at distance from breeding sites, including common and little tern. Impacts will also be avoided completely within and adjacent to other parts of the Proposed Development where trenchless installation technologies or existing buried infrastructure are used for construction of connection corridors, such as the connections beneath the River Tees and south of the PCC Site.

15.6.70 Requirements to remove above ground infrastructure mean that decommissioning activities will be predominantly restricted to within the built footprint of the Proposed Development. Therefore, in most cases decommissioning activities will be able to avoid areas of semi-natural habitat that would be expected to support breeding, foraging and or roosting birds. This will limit the potential for impacts and effects on relevant species, especially in comparison with the construction phase where habitat clearance would have been required to enable the construction of the Proposed Development, such as at the PCC Site and the construction compounds and laydown areas. Where vegetation is affected, it is most likely to be soft landscaping planted for, or otherwise managed within the context of, the PCC Site. Given the combined duration of the construction and operational phases of the Proposed Development (over 44 years in total) it is likely that much of this vegetation will have matured to the point that it is of value to a range of bird species. The locations in which this would occur and the size, diversity and species composition of the bird assemblages that might become established in such areas cannot be identified with confidence at this time given the time that will have elapsed since baseline surveys reported in this chapter and associated appendices were undertaken.

15.6.71 No adverse effects of air quality, hydrological impacts or visual disturbance are expected on ornithological receptors, given decommissioning activities are comparable with or of lesser magnitude that construction activities, for which no adverse effects on ornithological receptors were identified.

15.6.72 Sound emissions for the decommissioning period will need modelling to determine the extent and severity of any percussive sound emissions from activities such as breaking of concrete and buildings. However decommissioning sound emissions are expected to be lower than those for construction, since piling (which is widely regarded as the noisiest construction activity and was used as the basis for the construction sound models), will not occur during decommissioning. At this stage sound emissions during decommissioning are expected to be no greater than negligible adverse and not significant for all ornithological receptors.

15.6.73 Significant visual impacts on birds are not expected to be significant during decommissioning for the same reasons that they were predicted to be insignificant during construction (paragraphs 15.6.23-15.6.25), namely that existing buildings, infrastructure and landscape features will provide effective visual screening

15.6.74 Decommissioning activities will be conducted in accordance with the appropriate guidance and legislation at the time of closure of the Proposed Development. A Decommissioning Environmental Management Plan (DEMP) will be produced and agreed with the Environment Agency as part of the Environmental Permitting and site surrender process. The DEMP will consider in detail all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed. Ornithological surveys will be commissioned as appropriate to inform the scope of the DEMP. This is discussed further within Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2).

15.6.75 On this basis, no significant effects on ornithological receptors are predicted as a result of the decommissioning phase of the Proposed Development.

15.7 Mitigation and Enhancement Measures

15.7.1 This section sets out the measures that are being put in place to mitigate significant impacts on ornithological receptors, and to provide biodiversity enhancement for ornithological interest features where required. These are additional to and separate from the committed impact avoidance and control measures described in Section 15.5, including all measures to be set out in the CEMP, sensitive lighting plan and DEMP.

Construction Mitigation

Habitat Losses

15.7.2 Mitigation for habitat losses are discussed below with respect to the impacts of site clearance, which removes or otherwise makes unavailable habitats used by breeding, feeding or resting birds, as well as creating potential breaches of relevant legislation protecting wild birds, their nests, eggs and dependent (see Appendix 12A,ES Volume III, Document Ref. 6.4).

15.7.3 Ground nesting species may be dissuaded from nesting in construction areas/access routes by removing the surface vegetation from the desired area (Jackson & Allan, 2000) before the breeding season commences. Some species, including certain ground-nesting waders including little ringed plover- favour bare ground for nesting purposes and therefore measures may be required at some locations to deter birds from settling once surface vegetation has been removed. The following approach would be taken to enable habitat clearance that is compliant with relevant legislation in relation to nesting birds:

- All clearance of habitats and buildings suitable for bird breeding activity would be undertaken outside the breeding season (the breeding season is typically March-August inclusive for most species), and site compounds and working areas will be established within this timeframe, where possible;

- In situations where this is not possible an ecologist would check the working area for nests before works commence. If active nests[11] are discovered during this process, then the ecologist would advise on appropriate mitigation to ensure that these are not impacted by construction activities. All relevant works would be completed in accordance with this advice and under the supervision of an ECoW; and
- Where there is a risk of birds nesting on bare ground where surface vegetation has been removed, visual or other deterrents will be employed strategically to discourage nesting attempts. Consultation with an appropriately experienced and qualified ecologist will be required to determine the need for and specification of such deterrents.

15.7.4 If, despite the specific actions outlined above, Schedule 1 species are found breeding within or next to the Proposed Development site, works will stop immediately, and the local authority and Natural England would be informed. Site and species-specific exclusion zones around breeding sites would be required to avoid disturbance at the breeding location(s) and these would be agreed, under advisement from a suitably experienced ornithologist, between the ECOW (assuming the ECOW does not also fulfil the role of a specialist ornithologist), the local authority and/or Natural England;

15.7.5 Paragraphs 12.7.1 – 12.7.2 of Chapter 12: Terrestrial Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2) and the high level measures to restore or reinstate habitats set out in the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12) outline the high level measures likely to be required to address habitat losses and the impacts on intrinsic habitat value within the wider footprint of the Proposed Development, such measures being relevant to the restoration of habitats used by birds to their pre-works condition and extent. These are:

- planting new areas of flower-rich grassland and native scrub within the PCC Site to compensate for permanent losses of these habitats during construction; and
- reinstatement of habitats subject to temporary disturbance such as those within the temporary construction and laydown compounds, where appropriate.

15.7.6 Working areas will be the minimum size required for construction to proceed efficiently and safely and so that habitat losses are minimised. Semi-natural habitats that are adjacent to working areas will be sectioned off with an appropriate form of fencing to prevent accidental damage to them during construction. The CEMP will include a method statement setting out a method of work to protect biodiversity; to minimise the footprint of the working area and to restrict access routes to and from the working area such that the highest value or most vulnerable areas of habitat avoided wherever possible, and so that the most sensitive areas with respect to nesting, roosting and feeding birds are protected from damage; and specifications for the strategic

[11] An active nest can be defined as any nest that is being built or is in use, which would be defined as a nest that contains eggs or young. This can be difficult to determine in some cases, such as for cryptic ground-nesting species, particularly those that do not construct a nest structure (such as lapwing or little ringed plover). In such cases an active nest would be determined through observations of territorial behaviour at a suspected nest site, birds flying repeatedly to/from a nest site, adult birds carrying food to such a site, or evidence for the presence of chicks.

use of track matting in sensitive habitats to minimise impacts on semi-natural habitat.

15.7.7 The bare ground, ephemeral habitat and low-growing grassland in the northern part of the footprint of the PCC Site will not be occupied by built infrastructure, however as a worst case they have been assumed to be set aside as permanent laydown areas and as such these habitats will be lost for little ringed plover, lapwing and skylark.

15.7.8 Barn owls have been recorded nesting and roosting at several locations within the Study Area (as described in Appendix 15B: Confidential Baseline Ornithology Report; ES Volume III, Document Ref. 6.4) and potentially suitable habitat exists within the PCC Site. Any buildings that need to be demolished to permit construction of the Proposed Development will first be assessed for the presence of barn owl. This assessment, and any follow-on survey requirements to determine presence/absence of barn owls, would be made by appropriately experienced ecologists within a suitable timeframe prior to commencement of demolition planning such that provisions can be made to exclude barn owls from potential roost and nest sites when they are not in use. If barn owls are present, the buildings will have to be left in situ and undisturbed until they are vacated voluntarily by the birds. Therefore, pre-demolition surveys should be carried out as far as possible in advance of the start date of any site clearance work, and outside of the breeding season (which for this species can be taken as March – September inclusive, although it should be noted that barn owls can theoretically breed at any time of year in the UK). It is recommended that surveys are carried out during the winter preceding the start of site clearance and that a further check is made no more than 24 hours ahead of the start of clearance works.

15.7.9 If barn owls are absent the buildings should either be demolished or rendered inaccessible to barn owls immediately. Gaps as small as 7cm in diameter are sufficient for barn owls to gain access to a potential nest or roost site, therefore all doors, windows and all other apertures and gaps in the building structure of 7cm diameter or larger would need to be blocked. In practice, there is a range of species that nest and roost on and within buildings, so blocking all gaps of any size would prevent access by other birds and is recommended, subject to any considerations and recommendations with respect to roosting bats set out in Chapter 12: Terrestrial Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2).

15.7.10 There will be no immediate requirement to provide alternative nesting/roosting sites because such a site already exists in the environs of the Proposed Development and this will not be affected by the Proposed Development. However, upon completion of construction of the PCC Site, and as set out in the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12) it is recommended that at least two barn owl boxes should be erected either on poles or on the side of one of the buildings in order to replace long term habitat losses of an existing roost and a nest site like for like. The chances of alternative (new) nest sites being adopted and used can be increased if they are installed within visual range of existing sites so that this provision can be “adopted” and recognised by dispersing and foraging barn owls. In the absence of mature trees on which to place the boxes, and with the potential for disused buildings not affected by the

Proposed Development to fall into disrepair or to be demolished for other reasons, using pole-mounted boxes or placing boxes on one of the PCC buildings would meet the requirements set out above and would ensure that they are within the land acquired for the Proposed Development.

15.7.11 General information regarding suitable specification for barn owl boxes and recommendations for their inspection, monitoring and maintenance, are included respectively in the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12). Further details regarding the specification, placement and monitoring of barn owl boxes will be provided in the final Landscape and Biodiversity Strategy, and secured by a Requirement in the draft DCO (Document Ref 2.1).

Operational Mitigation

15.7.12 Give the findings of the above impact assessment, mitigation measures are not considered necessary during operation of the Proposed Development. Compliance with relevant permits (to be agreed with relevant regulators post-consent) and planning obligations will be sufficient to manage the potential for adverse environmental and ecological effects.

Decommissioning Mitigation

15.7.13 Any necessary mitigation requirements would be determined and agreed at a future date prior to decommissioning. As part of this process, the Applicants would provide a DEMP. Relevant habitat and protected species surveys would be undertaken to inform the specification of relevant working methods and mitigation in the DEMP. This is discussed further within Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2).

Enhancement

15.7.14 National policy documents for Nationally Significant Infrastructure Projects emphasise the need to achieve no net loss of biodiversity, and to maximise opportunities for the enhancement of biodiversity. The requirement for biodiversity enhancement is dependent on the final design of the Proposed Development and the outcome of a formal Biodiversity Assessment which will be undertaken within the ES, if required.

15.7.15 An Indicative Landscape and Biodiversity Strategy is also submitted with the Application (Document Ref. 5.12). This sets out the approach to landscape and biodiversity mitigation and enhancement proposals. The measures included of relevance to this chapter are:

- favourable aftercare of grassland and scrub habitats, which would compensate for losses at construction of vegetation in which terrestrial bird species nest and forage, and habitat management prescriptions to maintain areas of longer, tussocky grassland for nesting and foraging birds;
- provision of a stormwater attenuation pond or wetland (depending on reliability of water supply and further design considerations) which will be designed to achieve ancillary gains for biodiversity, including for wetland birds; and

- installation of barn owl boxes, their regular inspection and monitoring, which would be reported to Redcar and Cleveland Council as a record of compliance.

Ecological Monitoring

15.7.16 The measures proposed to avoid and reduce, where possible, significant adverse effects on ecological features are set out above. Monitoring requirements to track compliance with these commitments during construction phase would be set out in the CEMP. In particular, an Ecological Clerk of Works would be employed to oversee the delivery of all necessary mitigation, including pre site clearance nesting bird checks, and work to be carried out under protected species licences and installation of pre-clearance replacement habitat such as barn owl boxes.

15.7.17 Monitoring will also be provided for a defined period (to be confirmed and agreed later during discharge of relevant Requirements) during operation to measure and monitor use of barn owl boxes and to monitor, post-construction, the success of committed landscape and biodiversity mitigation and enhancement measures within the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12) (including ongoing habitat use by birds in areas where measures have been put in place for them).

15.8 Limitations or Difficulties

15.8.1 Baseline conditions and relevant ecological features have been determined using appropriate methods. A sufficient level of survey was completed to assess fully the impact of the Proposed Development prior to submission on the Application in all locations. No ornithological survey was possible at the location of the Navigator Terminal, however a cautious worst-case assessment has been made for construction impacts at this location. Knowledge of the habitats present, the habitat preferences of the suite of species present across Teesside, the limitations presented to breeding birds by high baseline noise levels at this location and survey and third party data for the wider Study Area has been used to determine the likely use of this habitat by birds. There will be no impacts resulting from operation of the Proposed Development at this location.

15.9 Cumulative Effects

15.9.1 Details of other developments that have the potential to give rise to cumulative effects are provided in Chapter 24: Cumulative and Combined Effects (ES Volume I, Document Ref. 6.2). These have been reviewed for their scope, location and scale of the proposed works associated with them and those identified as having the potential for cumulative effects on ornithological receptors are considered in this chapter.

15.9.2 The specialist chapters within this ES identify no significant cumulative effects on aquatic ecology (Chapter 13: Aquatic Ecology and Nature Conservation, ES Volume I, Document Ref. 6.2); marine ecology (Chapter 14: Marine Ecology and Nature Conservation, ES Volume I, Document Ref. 6.2); terrestrial ecology (Chapter 12: Terrestrial Ecology and Nature Conservation, ES Volume I, Document Ref. 6.2); or hydrology and water

resources (Chapter 9: Surface Water, Flood Risk and Water Resources, ES Volume I, Document Ref. 6.2) that would affect ornithological receptors. Potential impacts of cumulative habitat losses and air quality impacts on habitats (which are used as a surrogate for impacts on birds) are discussed in Section 12.9, Chapter 12: Terrestrial Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2), which concludes that there are no significant cumulative effects of either of these potential impacts. Chapter 11: Noise and Vibration (ES Volume I, Document Ref. 6.2) has identified potential cumulative impacts that could occur within Coatham Dunes. The possibility of cumulative impacts arising from noise during construction and operation of the Proposed Development in combination with other developments was assessed and found to have no significant cumulative effect of disturbance to birds. Additional details are given below.

Noise

15.9.3 The noisiest activities associated with the Proposed Development will occur at the PCC Site and its environs south of the River Tees. There are no significant noise impacts predicted for any noise sensitive receptors north of the River Tees arising from the Proposed Development either in isolation or in combination with other developments. Cumulative noise impacts south of the River Tees in the environs of the PCC Site are considered further below.

15.9.4 Chapter 11: Noise and Vibration (ES Volume I, Document Ref. 6.2) gathered information from the noise assessments supporting the planning applications for which potential noise impacts were identified. The contributions of each of the other developments were determined for Coatham Dunes inclusive and exclusive of the noise emissions predicted for the Proposed Development. These are presented in Tables 15-10 and 15-11 for construction and operation respectively.

Construction

15.9.5 The cumulative construction noise impact shows no increase in noise levels close to the PCC Site above those resulting from the Proposed Development alone and a negligible increase in noise levels further away from the PCC Site (Table 15-10). However, the cumulative noise levels will not exceed those for the Proposed Development alone at any location, remaining at or below 70 dB. The cumulative noise impact during construction is assessed as not significant (neutral) for all ornithological receptors.

Operation

15.9.6 The baseline sound measurements for the Site show that at location E3 (refer to Figure 11-1, ES Volume II, Document Ref. 6.3) within Coatham Dunes birds are subjected to daytime L_{AFmax} sound levels of up to 59 dB, daytime ambient sound levels of 46 dB $L_{Aeq,16hr}$ and 43 dB $L_{Aeq,8hr}$ at night arising largely from existing industry. At sound monitoring location M3 (Tod Point Road) adjacent to the SPA, the equivalent sound levels are 81 dB, 56 dB and 47 dB respectively. Sound monitoring location M2 (York Road) is more representative of habitats east of the PCC Site but outside of the SPA. The baseline sound measurements here - respectively 87 dB, 66 dB and 52 dB - indicate that away from the Dunes, birds using the habitats to the east and south of the PCC Site are subject to higher baseline sound levels. This

indicates that the existing sound environment is very variable: average sound levels are not particularly high, but within a representative 15-minute period, very high baseline sound levels are experienced, especially within the habitats to the east of the PCC Site. This strongly suggests that birds in this area are exposed to (and thus likely to be habituated to) a highly variable sound environment with a significant impulsive sound element that at some locations is well above the 70 dB noise threshold agreed by Natural England.

15.9.7 Using night time ambient sound levels of 43 dB L_{Aeq} as a worst-case baseline on which to base an assessment within Coatham Dunes, Table 15-11 shows an increase in sound levels at Coatham Dunes of 8 dB due to other developments, which will occur irrespective of the Proposed Development, that in turn is predicted to contribute a further 1-6 dB above this level, to a maximum ambient sound level of 57 dB. While this is a relatively large increase above the current night time sound level, in the context of an environment within which birds are likely to be habituated to variable and often percussive noise emissions from existing emitters (principally road traffic and existing industry), it is not likely to result in a significant effect on birds and in any case falls well below the 70 dB noise response threshold above which significant effects on birds would occur. Table 11-32 of Chapter 11: Noise and Vibration (ES Volume I, Document Ref. 6.2)) shows that the contribution of the Proposed Development to cumulative noise emissions will be 1 dB above the levels predicted due to the combined operational sound levels of other major developments in the absence of the Proposed Development at Tod Point Road (NSR4, as shown on Figure 11-1, ES Volume II, Document Ref. 6.3). It is therefore reasonable to assume that the breeding and non-breeding birds that use habitats east and south of the PCC Site will be highly unlikely to alter their behaviour or habitat use in response to cumulative operational noise. Therefore, cumulative noise effects during operation are assessed as not significant (neutral) for all ornithological receptors.

Table 15-10: Assessment of Cumulative Noise Effects During Construction

Applicant	Highest predicted free-field noise level for daytime construction activity dB $L_{Aeq,12h}$[1] Coatham Dunes
The Proposed Development	55-70[2]
2 - York Potash Harbour	30
3 - Tees CCPP	N/A
4 - Dogger Bank Teesside A / Sofia Offshore Wind Farm	N/A
13 - CBRE	N/A
27 - Sirius Minerals	39
77 - Redcar Energy centre	50
83-87 STDC	39
Cumulative construction noise level of all developments without the Proposed Development	51
Cumulative construction noise level of all developments including the Proposed Development	57-70
Classification of effect resulting from the Proposed Development	**Not significant (neutral)**
Classification of cumulative effect	**Not significant (neutral)**

[1] Where levels are listed as “N/A” the receptor or receptors near it have not been included in the noise assessment so levels are assumed to be low enough as to not affect the assessment.

[2]Predicted noise levels vary between areas of the dunes. The 70 dB noise contour closely tracks South Gare Road, beyond which (within the dunes and Coatham Sands), sound levels drop (Figure 11-2, ES Volume II, Document Ref. 6.3).

Table 15-11: Assessment of Night-time Operational Cumulative Effects

Applicant	$L_{Aeq,T}$ dB[1] Coatham Dunes
2 - York Potash Harbour	21
3 - Tees CCPP	N/A
4 - Dogger Bank Teesside A / Sofia Offshore Wind Farm	N/A
13 - CBRE	N/A
27 - Sirius Minerals	30
77 - Redcar Energy centre	50
83-87 STDC	37
Cumulative operational noise level of all planned developments without the Proposed Development	50
Night-time ambient sound level	43
Future ambient sound level (Cumulative operational noise level of all developments without the Proposed Development summed with ambient sound level)	51
The Proposed Development	45-55
Cumulative operational noise level of all developments including the Proposed Development and ambient dB	52-57
Classification of effect resulting from the Proposed Development	**Not Significant (neutral)**
Classification of cumulative effect	**Not Significant (neutral)**

[1] Where levels are listed as "N/A" the receptor or receptors near it have not been included in the noise assessment so levels are assumed to be low enough as to not affect the assessment.

In-Combination Effects

15.9.8 The installation of the CO_2 Export Pipeline offshore will be carried out simultaneously with the Proposed Development but, being beyond the Site boundary will be the subject of a separate planning application and Environmental Assessment and as such falls within the scope of an assessment for in-combination effects with the Proposed Development.

15.9.9 The installation method will use trenchless HDD technology, and will involve either drilling from a pit onshore within the PCC Site to a receiver pit dredged approximately 2-3 km offshore, or drilling from the same location offshore to onshore, where the drill head will be retrieved from a receiving pit. Further technical details of the installation method are provided in Chapter 5: Construction Programme and Management (ES Volume I, Document Ref. 6.2)

15.9.10 In either scenario there will be no in-combination onshore impacts of this activity over and above those already assessed, since the onshore element of this work will be contained within the boundary of the PCC Site. However, there is potential for in-combination effects within the offshore environment. The following combined effects associated with the construction of the CO_2 Export Pipeline have been assessed in Section 14.10 of Chapter 14: Marine

Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2), which contains detailed assessment narrative for each of them:

- Direct loss and physical disturbance to habitat and species;
- Physical disturbance to habitats and species from increased suspended sediment concentrations (SSC, i.e. turbidity), including deposition of contaminant remobilisation;
- Indirect effects to marine ecology from changes in marine water quality (excluding turbidity, such as accidental spillages of fuel and oils); and
- Changes in underwater soundscape.

15.9.11 All of the potential in-combination effects on marine ecology listed above have the potential to affect marine organisms, including fish, and this could have indirect effects on pelagic birds and species that forage within the offshore environment, including little and common tern, through alterations to the distribution and abundance of prey species and the ability of birds to locate them. However, all of the above effects are assessed as not significant on marine ecology receptors in Chapter 14: Marine Ecology and Nature Conservation (ES Volume I, Document Ref. 6.2), because of the extremely limited spatial and temporal scale of these activities for the purposes of the Proposed Development. Consequently, the potential impacts of these effects on ornithology features will also be not significant.

15.9.12 The location of the launch pit or breakout point at 2-3 km offshore for the HDD for the CO_2 Export Pipeline will be within the extent of Teesmouth and Cleveland Coast SPA and is within the foraging range of both common and little terns. The presence of a pipeline laying vessel may therefore act as a localised barrier or deterrent to foraging seabirds and is considered below regardless of any other potential effects on the marine environment. A similar potential impact is explored and assessed in paragraphs 15.6.35 to 37 for the installation of a new water discharge outfall within the Tees Bay. The conclusions drawn and the reasons for those conclusions are equally applicable here: the spatial extent of the area affected (estimated to be approximately 500 m^2) represents an insignificant proportion of the wider offshore area of the SPA. This temporary impact will therefore in its own right be imperceptible in magnitude and not significant (neutral), and will not contribute to an in-combination effect on any ornithological features.

15.10 Residual Effects

Construction

15.10.1 No likely significant residual effects have been identified following consideration of the relevant ornithological baseline conditions, potential impact pathways and requirements/commitments for mitigation during construction.

Operation

15.10.2 The predicted aerial emissions of nutrient nitrogen arising from the processes of power generation and carbon capture do not, under current baseline conditions, present any risk of significant effects resulting from impacts on

any of the colonial breeding birds that are notified features of the Ramsar, SPA and SSSI (little tern, common tern, avocet and ringed plover). However little tern colonies are vulnerable to disturbance, predation, tidal inundation and habitat changes and the precedent exists within the Teesside area for this species to relocate suddenly to previously unused locations for colonial breeding (Bell and Leakey, 2019; Anon, 2020). Should the little tern colony relocate for 2021 or beyond, this might expose them to doses of nutrient nitrogen that are detrimental to their nesting habitat, with the potential for significant adverse effects in the long term. This is, however, highly unlikely given the long-term abandonment of former nest sites south of the River Tees; the fact that the only remaining suitable habitat at South Gare is limited in extent and vulnerable to tidal inundation; and that there are no suitable breeding sites within any part of the SSSI and SPA that will be affected by air quality impacts. Therefore, there is no likelihood of any effect on future breeding success of the little tern colony from nitrogen emission or other aspects of the Proposed Development, whether it remains at the existing site or not.

15.10.3 Impacts predicted to arise as a result of the Proposed Development will be controlled, mitigated or compensated for through appropriate design and mitigation measures. No significant residual effects on ornithological receptors are anticipated during the construction, operation or decommissioning of the Proposed Development.

15.10.4 No significant cumulative effects are anticipated as a result of the Proposed Development.

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