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Tees CCPP Project

The Tees Combined Cycle Power Plant Project
Land at the Wilton International Site, Teesside

Volume 2 - Annex G1

Regulations – 6(1)(b) and 8(1)

Applicant: Sembcorp Utilities UK
Date: November 2017

Annex G1

Effects of Air Quality on Nationally and Locally Designated Sites

G1 ANNEX G1 -INTRODUCTION

G1.1 PURPOSE OF THIS ANNEX

G1.1 This Annex provides an assessment of the likely effects of predicted Project emissions to atmosphere on nationally and locally designated sites during operation.

G1.2 APPROACH TO THE AIR QUALITY ASSESSMENT OF DESIGNATED SITES

G1.2.1 Overview to Screening Assessment

G1.2 The approach taken follows the guidance set out in the Planning Inspectorate's Advice Note 10 ⁽¹⁾ and guidance produced by the Defra / Environment Agency (EA) on screening risks from air emissions on protected areas for nature conservation ⁽²⁾. It has also taken account of a range of other guidance material such as guidance produced by the European Commission (EC) (2011 ⁽³⁾, 2007 ⁽⁴⁾; 2002 ⁽⁵⁾, 2000 ⁽⁶⁾).

G1.3 This process follows the HRA process by initially **Screening** to identify the likely effects of a project on a nationally designated site and consider whether there are likely to be adverse effects.

G1.2.2 Consultation and Key Issues

G1.4 Sembcorp is carrying out various consultation activities as part of the DCO process, including consulting Natural England (NE), Environment Agency (EA), the Secretary of State (SoS), Redcar and Cleveland Borough Council (RCBC) and North Yorkshire Country Council (NYCC). These responses are detailed in *Table 9.1 of Chapter 9 Ecology*.

G1.5 In particular to this assessment, it was noted that the screening of atmospheric emissions should include:

- Sites of Special Scientific Interest (SSSIs) within 15 km of the Project; and
- Local Wildlife Sites (LWSs) and ancient woodland within 2 km of the Project.

(1) Advice Note 10: Habitats Regulations Assessment relevant to nationally significant infrastructure projects. The Planning Inspectorate. Republished January 2016, Version 7.

(2) <https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#screening-for-protected-conservation-areas>

(3) European Commission (2011) *Guidelines on the Implementation of the Birds and Habitats Directives in Estuaries and Coastal Zones with Particular Attention to Port Development and Dredging*. **Advice Note 10 EC**

(4) European Commission (2007) *Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC*. EC

(5) European Commission (2002) *Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites. Methodological Guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*. EC

(6) European Commission (2000) *Managing Natura 2000 Sites - The Provisions of Article 6 of the 'Habitats' Directive 92/43/CEE*. EC

G1.2.3 Designated Sites

G1.6 No designated sites will be directly affected by the Project: the closest SSSI is Lovell Hill Pools, which is 3 km to the southeast. The closest LWS is Wilton Woods Complex LWS which lies 1.2 km to the south.

G1.7 Designated sites that were included in the assessment are detailed below, along with their Areas of Search (AoS):

- SSSIs within 15 km of the Project, in line with Environment Agency (EA) guidance, SSSIs which could be affected by air pollutants from the Project were identified as those which fell within a radius of 15 km from the Project, adopting the worst case distance for effects from larger emitters, as defined by Defra / EA Guidance ⁽¹⁾; and
- National Nature Reserve (NNRs), Local Nature Reserves (LNRs), Local Wildlife Sites (LWSs) and ancient woodland within 2 km of the Project.

G1.8 There are 15 SSSIs within a 15 km radius of the Project site (listed in *Table G1.1*) and two LWSs within 2 km (one of which contains ancient woodland listed on the Ancient Woodland Inventory published by NE) (see *Table G1.2*). No NNRs or LNRs were identified within 2 km of the Project.

Table G1.1 SSSIs within 15 km of the Project

SSSI	Distance and Direction from Site in km	Citation features
Lovell Hill Pools	3.0 km SE	A mosaic of former mining pit ponds supporting an outstanding assemblage of dragonflies and damselflies.
Tees & Hartlepool Foreshore & Wetlands	3.9 km W	A discontinuous site comprising several unconnected areas including freshwater pools, grazing marsh, inter tidal mud and rocky foreshore which together support large numbers of migratory and wintering waterbirds.
South Gare & Coatham Sands	4.7 km N	Of considerable interest for its flora, invertebrate fauna and birdlife. The range of habitats present includes extensive tracts of intertidal mud and sand, sand dunes, saltmarsh and freshwater marsh.
Seal Sands	5.7 km N	An extensive area of intertidal mudflats, with tidal channels that are of great ornithological importance attracting large numbers of migratory wildfowl and wading birds especially during the winter months.
Redcar Rocks	6.0 km NE	Geologically important site - exposures of rock in the Lower Lias which display most of the stratigraphical interval missing from classic sections along the Yorkshire coast and which are composed of calcareous shales containing characteristic fossil ammonites. When exposed at low tide the rocks and sands provide an important feeding ground for several species of wading birds.
Seaton Dunes & Common	6.6 km N	An area of considerable importance for its flora, invertebrate fauna and bird life. The range of habitats present includes sandy, muddy and rocky foreshore, marsh, dunes, dune slacks and dune grassland.

(1)<https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit> First accessed 01/02/17

SSSI	Distance and Direction from Site in km	Citation features
Cowpen Marsh	7.1 km NW	Includes the largest saltmarsh between Lindisfarne and the Humber Estuary and together with adjacent coastal grazing marshes and mudflats it provides an important wintering site for migratory wildfowl and wading birds.
Roseberry Topping	7.5 km S	Geologically important site - a nationally important palaeobotanical site famous for the large assemblage of fossils from its Middle Jurassic plant bed laid down about 170 million years ago.
North York Moors	7.6 km S	The North York Moors contain the largest continuous tract of heather moorland in England. The site is of national importance for its mire and heather moorland vegetation communities and of international importance for its breeding bird populations, particularly merlin and golden plover.
Langbaurch Ridge	7.8 km S	Geologically important site - a disused quarry along Langbaurch Ridge exposes sections of the 'Cleveland Dyke'.
Cliff Ridge	8.5 km S	Geologically important site - the upper quarries at Cliff Ridge show the Cleveland Dyke in full cross-section and in contact with thermally altered metamorphosed sediments.
Saltburn Gill	10.2 km E	Saltburn Gill is a steep sided coastal dene, incised into glacial clays, shales and sandstones of the Lower Jurassic period. The site comprises the eastern slopes of the gill which are of particular importance in supporting one of the few relatively undisturbed areas of mixed deciduous woodland in Cleveland.
Kildale Hall	11.3 km S	Geologically important site. Important for a sequence of minerogenic and organic deposits infilling a former kettlehole. These deposits have yielded a continuous palaeoenvironmental record from the Late Devensian to the Middle Flandrian.
Hartlepool Submerged Forest	11.3 km N	Geologically important site - a peat bed, in the intertidal area, the deposits from which been used to establish the pattern of relative sea level change over the last 5,000 years.
Pinkney and Gerrick Woods	14.7 km SE	An area of deciduous woodland on the steep slopes of Kilton Beck. It is of importance as one of the few ancient woodland sites in Cleveland which remains in a largely semi-natural condition.

G1.9 Sites that have been scoped out of further assessment as they are not sensitive to air quality effects have been highlighted in grey.

Table G1.2 *Locally Designated Sites within 2 km of the Project*

Designated Site	Distance and Direction from Site in km	Key features
Wilton Woods Complex (LWS)	1.2 km S	A woodland complex part of which comprises ancient semi-natural woodland and plantation on ancient woodland sites, both listed on the Ancient Woodland Inventory (AWI).
Eston Moor (LWS)	1.9 km S	Designated for lowland heath and basin mire habitats.

- G1.10 The locations of these designated sites are shown in *Figures 9.1 and 9.2* of the Ecology Chapter.
- G1.11 The approach to assessing the effects on habitats and species from emissions to air is more prescriptive and complex, and further details have been provided in *Section G1.3*.
- G1.3** ***APPROACH TO ASSESSING THE EFFECTS ON DESIGNATED SITES FROM EMISSIONS TO AIR***
- G1.12 Information about the relative sensitivity to air pollutants of qualifying interest habitats and plant species, and habitats supporting qualifying interest fauna species of the SSSIs and LWSs, was obtained from the Air Pollution Information System (APIS) ⁽¹⁾.
- G1.13 The critical levels ⁽²⁾ and critical loads ⁽³⁾ used as tools for helping to assess the risk of air pollutants on habitats, were obtained from APIS. Critical levels (*eg* for effects from NO_x) are not assessed on a habitat or species-specific basis; rather they are assessed against standards which are applied for all habitat types and locations. These standards are 30 µg m⁻³ annual average for NO_x. Effects relating to acid and nutrient nitrogen deposition are considered by a habitat and species specific approach, against the specific critical loads listed in APIS.
- G1.14 The Process Contributions (PC) ⁽⁴⁾ have been predicted to include concentrations in both the short (24 hr averages) and long term (annual averages).
- G1.15 The screening approach to determine whether the PCs were insignificant, or required further assessment, was undertaken by comparing the PCs, and where necessary Predicted Environmental Contributions (PECs) ⁽⁵⁾, against the percentages of the critical levels / loads set out in the Defra / EA guidance ⁽⁶⁾ (see *Table G1.3*).

(1) <http://www.apis.ac.uk/>

(2) Critical levels are defined as "concentrations of pollutants in the atmosphere above which direct adverse effects on receptors, such as human beings, plants, ecosystems or materials, may occur according to present knowledge". (Source: [www.unece.org/env/lrtap/Working Groups/wge/definitions.htm](http://www.unece.org/env/lrtap/Working%20Groups/wge/definitions.htm))

(3) Critical Loads are defined as: " a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge" (Source: [www.unece.org/env/lrtap/Working Groups/wge/definitions.htm](http://www.unece.org/env/lrtap/Working%20Groups/wge/definitions.htm))

(4) Process Contribution (PC) is the environmental concentrations of each substance emitted to air (<https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#screening-for-protected-conservation-areas>)

(5) Predicted Environmental Concentration (PEC) is the PC for each substance plus the concentration of the substance already present in the environment.

(6) <https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#screening-for-protected-conservation-areas>

Table G1.3 Assessment Criteria for Habitats and Species

Criterion	Assessment
Long Term / Short Term	
PC < 1% of CL (long) PC < 10% of CL (short)	Insignificant contribution either alone, or in-combination with other projects. No further assessment required, and considered in the ecological assessment to have no likely significant effect.
PC > 1% of CL (long) or >10% of CL (short) PEC < 70% of CL	Insignificant contribution and considered in the ecological assessment to have no likely significant effect for the Project alone but further assessment may be required for long-term effects ⁽¹⁾ in-combination with other projects to determine the effects on habitats and species.
PC > 1% of CL (long) or > 10% of CL (short) PEC > 70% of CL	Potential for significant ⁽²⁾ contribution and considered in the ecological assessment to have a likely significant effect for the Project alone, and further assessment may be required in-combination with other projects to determine the effects on habitats and species

G1.16 The levels and loads of air pollutants at habitats in the designated sites were predicted by air dispersion modelling. Details about the model and its input data can be found in *Chapter 7 Air Quality*. The predicted levels / loads used in this assessment are based on the worst case scenario.

G1.4 SCREENING FOR POTENTIAL EFFECTS ON NATIONALLY AND LOCALLY DESIGNATED SITES

G1.4.1 Introduction

G1.17 This section summarises the findings of the screening assessment. The assessment of nationally and locally designated sites follows that detailed for the HRA (*Annex H*) as a number of the SSSIs are component parts of European Sites.

G1.18 A summary of the air dispersion modelling results (described in more detail in *Chapter 7 Air Quality*) is presented below. *Table G1.4* contains details of the predicted levels of nutrient nitrogen deposition. *Table G1.5* contains details of the predicted levels of acid deposition and *Table G1.6* and *Table G1.7* ambient NO_x concentration at each of the identified sites, and the PC/PEC as percentages of the CLs. For acid deposition and nutrient nitrogen deposition, impacts are set out only for the qualifying feature with the most sensitive Critical Loads, although all habitats with CLs were included in the modelling. This is due to the large amount of data required to present results for each receptor and every qualifying feature.

(1) Short-term effects are excluded from further assessment as by their nature they are very unlikely to create any cumulative impact.

(2) The term ‘significant’ is used here in the context of its meaning within the Defra/EA guidance and not within the context of the EIA Regulations.

Table G1.4 Predicted Nutrient Nitrogen Deposition at Ecological Receptors (Annual Mean) – for most sensitive qualifying feature of each site

Designated Site	Most Sensitive Habitat Feature	Critical Nutrient Nitrogen Deposition (CL) (kgN ha ⁻¹ yr ⁻¹)	Load for Process Contribution (PC) (kgN ha ⁻¹ yr ⁻¹)	PC/CL (%)		Background Nutrient Nitrogen Deposition (kgN ha ⁻¹ yr ⁻¹)	PEC (kgN ha ⁻¹ yr ⁻¹)	PEC/CL (%)		Potential Significant Effect (Yes/No)	
				Min	Max			Min	Max		
Lovell Hill Pools SSSI	<i>Coenagrion pulchellum</i> variable damselfly	Sensitive but no CL		0.0252	n/a	n/a	15.12	n/a	n/a	n/a	n/a
Tees & Hartlepool Foreshore & Wetlands SSSI	Littoral sediment supporting <i>Calidris alba</i> sanderling	20	30	0.0152	<1	<1	17.92	-	-	-	No
South Gare & Coatham Sands SSSI	Supralittoral sediment (acidic type) supporting <i>Sterna albifrons</i> little tern	8	10	0.0440	<1	<1	12.74	-	-	-	No
Seal Sands SSSI	Littoral sediment supporting <i>Calidris canutus</i> knot	20	30	0.0203	<1	<1	13.86	-	-	-	No
Redcar Rocks SSSI	Littoral sediment supporting <i>Charadrius hiaticula</i> ringed plover	20	30	0.0375	<1	<1	15.68	-	-	-	No
Seaton Dunes & Common SSSI	Supralittoral sediment (acidic type) supporting <i>Charadrius hiaticula</i> ringed plover	8	10	0.0240	<1	<1	12.74	-	-	-	No
Cowpen Marsh SSSI	Neutral grassland (<i>Festuca rubra</i> - <i>Agrostis stolonifera</i> - <i>Potentilla anserina</i> grassland)	20	30	0.086	<1	<1	18.48	-	-	-	No
North York Moors SSSI	Bogs (<i>Calluna vulgaris</i> - <i>Eriophorum vaginatum</i> blanket mire)	5	10	0.0318	<1	<1	23.52	-	-	-	No

Designated Site	Most Sensitive Habitat Feature	Critical Load for Process Contribution (CL) Nutrient Nitrogen Deposition (kgN ha ⁻¹ yr ⁻¹)	PC/CL (%)		Background Nutrient Nitrogen Deposition (kgN ha ⁻¹ yr ⁻¹)	PEC (kgN ha ⁻¹ yr ⁻¹)	PEC/CL (%)		Potential Significant (Yes/No)	Effect	
			Min	Max			Min	Max			Min
Saltburn Gill SSSI	Broad-leaved, mixed and yew woodland (<i>Fraxinus excelsior</i> - <i>Acer campestre</i> - <i>Mercurialis perennis</i> woodland)	15	20	0.0274	<1	<1	34.72	-	-	-	No
Pinkney and Gerrick Woods SSSI	Broad-leaved, mixed and yew woodland (<i>Alnus glutinosa</i> - <i>Fraxinus excelsior</i> - <i>Lysimachia nemorum</i> woodland)	10	20	0.0257	<1	<1	27.86	-	-	-	No
Wilton Woods Complex LWS	Broadleaved, mixed and yew woodland - Acidophilous <i>Quercus</i> -dominated woodland (1)	10	15	0.1868	<100	<100	32.90	-	-	-	No
Eston Moor LWS	Fen, marsh and swamp - valley mires, poor fens and transition mires	10	15	0.1200	<100	<100	20.02	-	-	-	No

(1) Most sensitive woodland habitat modelled as a precautionary approach in the absence of site-specific data.

Table G1.5 Predicted Acid Deposition at Ecological Receptors (Annual Mean) – for most sensitive qualifying feature of each site

Designated Site	Most Sensitive Habitat Feature	Critical Load (CL) for Acid Deposition (keq ha ⁻¹ yr ⁻¹)			Background Acid Deposition (keq ha ⁻¹ yr ⁻¹)		PC total as % of CL total	PEC total as % of CL total	Potential Significant Effect (Yes/No)
		CL max S	CL min N	CL max N	S baseline	N baseline			
Lovell Hill Pools SSSI	<i>Coenagrion pulchellum</i> variable damselfly	Sensitive but no CL			0.33	1.08	n/a	n/a	n/a
Tees & Hartlepool Foreshore & Wetlands SSSI	Standing open water and canals supporting <i>Anas clypeata</i> shoveler	Sensitive but no CL			0.47	0.78	n/a	n/a	n/a
South Gare & Coatham Sands SSSI	Supralittoral sediment (acidic type) supporting <i>Sterna albifrons</i> little tern	4.6	0.223	4.283	0.48	0.91	<1	-	No
Seal Sands SSSI	Neutral grassland - acid grassland supporting <i>Tringa totanus</i> - redshank	4.6	0.438	4.498	0.45	0.99	<1	-	No
Redcar Rocks SSSI	Littoral sediment supporting <i>Charadrius hiaticula</i> ringed plover	Not sensitive			0.4	1.12	n/a	n/a	No
Seaton Dunes & Common SSSI	Supralittoral sediment (acidic type) supporting <i>Charadrius hiaticula</i> ringed plover	1.56	0.223	1.998	0.45	0.91	<1	-	No
Cowpen Marsh SSSI	Neutral grassland (<i>Festuca rubra</i> - <i>Agrostis stolonifera</i> - <i>Potentilla anserina</i> grassland)	1.56	0.438	1.998	0.45	1.32	<1	-	No
North York Moors SSSI	Bogs (<i>Calluna vulgaris</i> - <i>Eriophorum vaginatum</i> blanket mire)	0.183	0.321	0.54	0.47	1.68	<1	-	No
Saltburn Gill SSSI	Broad-leaved, mixed and yew woodland (<i>Fraxinus excelsior</i> - <i>Acer campestre</i> - <i>Mercurialis perennis</i> woodland)	2.448	0.142	2.639	0.44	2.48	<1	-	No
Pinkney and Gerrick Woods SSSI	Broad-leaved, mixed and yew woodland (<i>Alnus glutinosa</i> - <i>Fraxinus excelsior</i> - <i>Lysimachia nemorum</i> woodland)	2.435	0.357	2.792	0.41	1.99	<1	-	No
Wilton Woods Complex LWS	Broadleaved, mixed and yew woodland	0.92	0.14	1.06	0.33	2.35	<100	-	No
Eston Moor LWS	Dwarf shrub heath	1.59	0.71	2.30	0.27	1.43	<100	-	No

Table G1.6 Predicted NOx at Ecological Receptors (Annual Mean)

Designated Site	Critical Level ($\mu\text{g m}^{-3}$)	Background Conditions ($\mu\text{g m}^{-3}$)	PC ($\mu\text{g m}^{-3}$)	PC / CL (%)	PEC ($\mu\text{g m}^{-3}$)	PEC / CL (%)	Potential Significant Effect (Yes/No)
Lovell Hill Pools SSSI	30	15.8	0.175	<1	-	-	No
Tees & Hartlepool Foreshore & Wetlands SSSI	30	31.8	0.105	<1	-	-	No
South Gare & Coatham Sands SSSI	30	31.8	0.306	<1 (1)	-	-	No
Seal Sands SSSI	30	31.8	0.141	<1	-	-	No
Redcar Rocks SSSI	30	18.9	0.261	<1	-	-	No
Seaton Dunes & Common SSSI	30	31.8	0.167	<1	-	-	No
Cowpen Marsh SSSI	30	31.8	0.060	<1	-	-	No
North York Moors SSSI	30	11.3	0.221	<1	-	-	No
Saltburn Gill SSSI	30	11.8	0.095	<1	-	-	No
Pinkney and Gerrick Woods SSSI	30	7.92	0.089	<1	-	-	No
Wilton Woods Complex LWS	30	16.2	0.649	<100%	-	-	No
Eston Moor LWS	30	16.2	0.834	<100%	-	-	No

(1) For South Gare & Coatham Sands SSSI, the PC/CL% is 1.02. This is a negligible increase over 1 and therefore the site has been included in the <1% category and is not considered to exceed the screening criteria. In practice, as the facility will not operate at 100% capacity, for 100% of the year the actual PC will be <1%.

Table G1.7 Predicted NOx at Ecological Receptors (24hr Mean)

Designated Site	Critical Level ($\mu\text{g m}^{-3}$)	Background Conditions ($\mu\text{g m}^{-3}$)	PC ($\mu\text{g m}^{-3}$)	PC / CL (%)	PEC ($\mu\text{g m}^{-3}$)	PEC / CL(%)	Potential Significant Effect (Yes/No)
Lovell Hill Pools SSSI	75	31.5	3.4	<10	-	-	No
Tees & Hartlepool Foreshore & Wetlands SSSI	75	63.6	3.29	<10	-	-	No
South Gare & Coatham Sands SSSI	75	63.6	3.18	<10	-	-	No
Seal Sands SSSI	75	63.6	2.57	<10	-	-	No
Redcar Rocks SSSI	75	37.8	1.98	<10	-	-	No
Seaton Dunes & Common SSSI	75	63.6	1.96	<10	-	-	No
Cowpen Marsh SSSI	75	63.6	1.34	<10	-	-	No
North York Moors SSSI	75	22.6	9.19	12	31.8	<70% (42%)	No
Saltburn Gill SSSI	75	23.6	1.40	<10	-	-	No
Pinkney and Gerrick Woods SSSI	75	15.8	3.60	<10	-	-	No
Wilton Woods Complex LWS	75	32.4	23.8	<100%	-	-	No
Eston Moor LWS	75	32.4	29.8	<100%	-	-	No

G1.19 *Table G1.8* summarises the screening assessment for each designated site, detailing where potential effects from Project emissions to atmosphere have been identified, or have not been ruled out by air dispersion modelling, and providing an assessment of these potential effects on the citation features.

Table G1.8 Screening Summary

Designated Site Potentially Sensitive to Air Quality Effects	Criteria not exceeded or can be Scoped out of requiring further assessment.	Rationale for Assessment
Lovell Hill Pools SSSI	<p>Scoped out of requiring further assessment</p> <p>Criteria not exceeded</p>	<p>No CLs are available for the assessment of nitrogen or acid deposition on this site (see <i>Tables G1.4 and G1.5</i>), which consists of a mosaic of ponds (standing open water and canals habitat type) within a well-wooded agricultural landscape which support an outstanding assemblage of dragonflies and damselflies. The SSSI is currently in favourable condition. Key issues identified in the 'Views about Management' SSSI report ⁽¹⁾ include maintenance of the pond structure and structural diversity of the plant species associated with it, water quality (mainly as a result of pollution from direct discharges and also from diffuse sources resulting from land management practices like agriculture in the wider catchment) and abstraction. The condition assessment report ⁽²⁾ also notes that predation from a large flock of mallard ducks resident on one of the ponds could be a problem in the future. As emissions to air are not a key concern and Project PCs for nutrient nitrogen are low (only 0.2% of background levels), no significant effects are predicted, and hence further assessment is not required.</p> <p>The air quality assessment predicted that the contribution of the Project to ambient NO_x was insignificant (either long or short term, see <i>Tables G1.6 and G1.7</i>) and below the level at which significant ecological effects at the SSSI could result.</p>
Tees & Hartlepool Foreshore & Wetlands SSSI	<p>Criteria not exceeded</p> <p>Scoped out of requiring further assessment</p>	<p>The air quality assessment predicted that the contributions of the Project in terms of deposited nitrogen or acid were insignificant (see <i>Tables G1.4 and G1.5</i>) and below the level at which significant ecological effects could result on: littoral sediment (pioneer, low-mid, mud-upper saltmarshes) supporting <i>Calidris alba</i> sanderling; or littoral rock (not sensitive).</p> <p>No CLs were available for the assessment of standing open water and canals or lowland open water and their margins habitat types (see <i>Tables G1.4 and G1.5</i>). However, nutrient nitrogen inputs for these habitats are influenced predominantly by water based nutrient loadings (e.g.</p>

(1) Natural England (2004) Lovell Hill Pools Views about Management, Countryside and Rights of Way Act 2000, Schedule 11(6), Version date: 06.10.04

(2) <https://designatedsites.naturalengland.org.uk/ReportUnitCondition.aspx?SiteCode=S2000387&ReportTitle=Lovell Hill Pools SSSI>

Designated Site Potentially Sensitive to Air Quality Effects	Criteria not exceeded or can be Scoped out of requiring further assessment.	Rationale for Assessment
	Criteria not exceeded	<p>from agricultural run-off) rather than by air emissions. Therefore no significant effects are predicted and no further assessment is required.</p> <p>The air quality assessment predicted that the contribution of the Project to ambient NO_x was insignificant (either long or short term – see <i>Tables G1.6</i> and <i>G1.7</i>) and below the level at which significant ecological effects at the SSSI could result.</p>
South Gare & Coatham Sands SSSI	<p>Criteria not exceeded</p> <p>Scoped out of requiring further assessment</p> <p>Criteria not exceeded</p>	<p>The air quality assessment predicted that the contributions of the Project in terms of deposited nitrogen or acid were insignificant and below the level at which significant ecological effects could result on:</p> <p>supralittoral sediment (coastal stable dune grasslands and shifting coastal dunes); or littoral sediment (pioneer, low-mid, mud-upper saltmarshes) supporting <i>Charadrius hiaticula</i> ringed plover, <i>Sterna albifrons</i> little tern, <i>Calidris alba</i> sanderling and <i>Calidris canutus</i> knot.</p> <p>No CLs were available for the assessment of a number of other supralittoral sediment (dune grasslands and other dune communities) habitat types (see <i>Tables G1.4</i> and <i>G1.5</i>). However, these habitats are very similar to those assessed above and therefore no significant effects are predicted and no further assessment is required.</p> <p>The air quality assessment predicted that the contribution of the Project to ambient NO_x was insignificant (either long or short term, see <i>Tables G1.6</i> and <i>G1.7</i>) and below the level at which significant ecological effects at the SSSI could result.</p>
Seal Sands SSSI	<p>Criteria not exceeded</p> <p>Criteria not exceeded</p>	<p>The air quality assessment predicted that the contributions of the Project in terms of deposited nitrogen or acid were insignificant (see <i>Tables G1.4</i> and <i>G1.5</i>) and below the level at which significant ecological effects could result on:</p> <p>neutral grassland; littoral sediment; or improved grassland supporting <i>Tringa totanus</i> redshank, <i>Calidris canutus</i> knot and <i>Tadorna tadorna</i> shelduck.</p> <p>The air quality assessment predicted that the contribution of the Project to ambient NO_x was insignificant (either long or short term, see <i>Tables G1.6</i> and <i>G1.7</i>) and below the level at which significant ecological effects at the SSSI could result.</p>

Designated Site Potentially Sensitive to Air Quality Effects	Criteria not exceeded or can be Scoped out of requiring further assessment.	Rationale for Assessment
Redcar Rocks SSSI	<p>Criteria not exceeded</p> <p>Criteria not exceeded</p>	<p>The air quality assessment predicted that the contributions of the Project in terms of deposited nitrogen or acid were insignificant (see <i>Tables G1.4</i> and <i>G1.5</i>) and below the level at which significant ecological effects could result on littoral sediment supporting <i>Charadrius hiaticula</i> ringed plover, <i>Calidris alba</i> sanderling and <i>Calidris canutus</i> knot.</p> <p>The air quality assessment predicted that the contribution of the Project to ambient NO_x was insignificant (either long or short term, see <i>Tables G1.6</i> and <i>G1.7</i>) and below the level at which significant ecological effects at the SSSI could result.</p>
Seaton Dunes & Common SSSI	<p>Criteria not exceeded</p> <p>Scoped out of requiring further assessment</p> <p>Criteria not exceeded</p>	<p>The air quality assessment predicted that the contributions of the Project in terms of deposited nitrogen or acid were insignificant (see <i>Tables G1.4</i> and <i>G1.5</i>) and below the level at which significant ecological effects could result on: supralittoral sediment (coastal stable dune grasslands and shifting coastal dunes); and littoral rock (pioneer, low-mid, mud-upper saltmarshes); and littoral sediment (pioneer, low-mid, mud-upper saltmarshes) supporting <i>Charadrius hiaticula</i> ringed plover, <i>Arenaria interpres</i> turnstone, <i>Calidris alba</i> sanderling and <i>Calidris canutus</i> knot.</p> <p>No CLs were available for the assessment of a number of other supralittoral sediment (dune grasslands and other dune communities) and littoral sediment (saltmarsh) habitat types (see <i>Tables G1.4</i> and <i>G1.5</i>). However, these habitats are very similar to those assessed above and therefore no significant effects are predicted and no further assessment is required.</p> <p>The air quality assessment predicted that the contribution of the Project to ambient NO_x was insignificant (either long or short term, see <i>Tables G1.6</i> and <i>G1.7</i>) and below the level at which significant ecological effects at the SSSI could result.</p>
Cowpen Marsh SSSI	<p>Criteria not exceeded</p> <p>Scoped out of requiring further assessment</p>	<p>The air quality assessment predicted that the contributions of the Project in terms of deposited nitrogen or acid were insignificant (see <i>Tables G1.4</i> and <i>G1.5</i>) and below the level at which significant ecological effects could result on neutral grassland habitats.</p> <p>No CLs were available for the assessment of a number of littoral sediment (saltmarsh and swamp communities) or fen, marsh and swamp habitat types (see <i>Tables G1.4</i> and <i>G1.5</i>). However, similar habitats have been assessed for other nearby SSSIs and no significant effects have been identified. Therefore no significant effects are predicted for these habitats, and no</p>

Designated Site Potentially Sensitive to Air Quality Effects	Criteria not exceeded or can be Scoped out of requiring further assessment.	Rationale for Assessment
	Criteria not exceeded	<p>further assessment is required.</p> <p>The air quality assessment predicted that the contribution of the Project to ambient NO_x was insignificant (either long or short term, see <i>Tables G1.6</i> and <i>G1.7</i>) and below the level at which significant ecological effects at the SSSI could result.</p>
North York Moors SSSI	Criteria not exceeded	<p>The air quality assessment predicted that the contributions of the Project in terms of deposited nitrogen or acid were insignificant (see <i>Tables G1.4</i> and <i>G1.5</i>) and below the level at which significant ecological effects could result on:</p> <p>bogs; neutral grassland; littoral sediment; improved grassland; dwarf shrub heath; or fen, marsh and swamp habitats supporting <i>Pluvialis apricaria</i> golden plover and <i>Falco columbarius</i> merlin.</p>
Saltburn Gill SSSI	Criteria not exceeded	<p>The air quality assessment predicted that the contributions of the Project in terms of deposited nitrogen or acid were insignificant (see <i>Tables G1.4</i> and <i>G1.5</i>) and below the level at which significant ecological effects could result on broad-leaved, mixed and yew woodland.</p>
	Criteria not exceeded	<p>The air quality assessment predicted that the contribution of the Project to ambient NO_x was insignificant (either long or short term, see <i>Tables G1.6</i> and <i>G1.7</i>) and below the level at which significant ecological effects at the SSSI could result.</p>
Pinkney and Gerrick Woods SSSI	Criteria not exceeded	<p>The air quality assessment predicted that the contributions of the Project in terms of deposited nitrogen or acid were insignificant (see <i>Tables G1.4</i> and <i>G1.5</i>) and below the level at which significant ecological effects could result on broad-leaved, mixed and yew woodland.</p>
	Criteria not exceeded	<p>The air quality assessment predicted that the contribution of the Project to ambient NO_x was insignificant (either long or short term, see <i>Tables G1.6</i> and <i>G1.7</i>) and below the level at which</p>

Designated Site Potentially Sensitive to Air Quality Effects	Criteria not exceeded or can be Scoped out of requiring further assessment.	Rationale for Assessment
		significant ecological effects at the SSSI could result.
Wilton Woods Complex LWS	Criteria not exceeded	The air quality assessment predicted that the contributions of the Project in terms of deposited nitrogen or acid were insignificant (see <i>Tables G1.4</i> and <i>G1.5</i>) and below the level at which significant ecological effects could result on broadleaved, mixed and deciduous woodland.
	Criteria not exceeded	The air quality assessment predicted that the contribution of the Project to ambient NO _x was insignificant (either long or short term, see <i>Tables G1.6</i> and <i>G1.7</i>) and below the level at which significant ecological effects at the LWS could result.
Eston Moor LWS	Criteria not exceeded	The air quality assessment predicted that the contributions of the Project in terms of deposited nitrogen or acid were insignificant (see <i>Tables G1.4</i> and <i>G1.5</i>) and below the level at which significant ecological effects could result on: fen, marsh and swamp; or dwarf shrub heath.
	Criteria not exceeded	The air quality assessment predicted that the contribution of the Project to ambient NO _x was insignificant (either long or short term see <i>Tables G1.6</i> and <i>G1.7</i>) and below the level at which significant ecological effects at the LWS could result.

G1.4.2 *Summary of Screening Assessment*

G1.20 Five SSSIs have been scoped out of assessment as they are insensitive to air quality effects (see *Table G1.1*). A further 10 SSSIs within 15 km of the Project and two LWSs within 2 km of the Project were identified as potentially sensitive to air quality effects.

G1.21 The results of the Screening Assessment for all of the habitats contained within the designated sites are presented in *Table G1.8*. No significant effects on the designated sites are predicted as a result of emissions from the Project.

G1.5 *ASSESSMENT OF CUMULATIVE EFFECTS DUE TO AIR QUALITY IMPACTS*

G1.5.1 *Introduction*

G1.22 This section should be read in conjunction with *Annex H* which contains the HRA No Significant Effects Report (NSER) and addresses in-combination (i.e. cumulative) effects on European sites. Before assessing cumulative effects it is worth considering the effects that need to be assessed, which in this instance comprise long-term NO_x exposure, nutrient nitrogen deposition and acid deposition effects on habitats, together with the background context for these pollutants.

G1.23 For developments which emit air pollution, there is no practical guidance published on the approach to cumulative assessment. Previous approaches to this for European and nationally designated sites have taken levels below 1% as being insignificant alone, or in-combination. However, recent case law relating to the effects of air pollutants on habitat of European sites, has reiterated the need to aggregate contributions to determine whether a significant effect is likely in-combination, even where they are all insignificant alone ⁽¹⁾. Given the assessment approach for non-European sites is similar, such a determination is considered likely to apply also to sites designated for their national and local nature conservation importance.

G1.24 The air quality modelling for the Project does not identify any potential effects on the habitats and species associated with the identified designated sites. Project contributions of nutrient nitrogen, acid deposition and oxides of nitrogen (NO_x) were all found to be insignificant, or not to require further assessment in cases of habitat types for which CLs have yet to be defined.

G1.25 The information provided in this assessment seeks to explain why in this case the effects of the identified projects are unlikely to have a significant effect cumulatively. Notwithstanding this, a qualitative cumulative assessment of relevant projects, including those with insignificant effects alone, has been undertaken.

(1) *Wealden v SSCLG* [2017] EWHC 351 (Admin)

G1.5.2 *Critical Levels/Loads*

G1.26 The Critical Level / Load (CL) thresholds for specific pollutant and habitat types have been drawn up based on the collective views of a working group of experts (through the United Nations Economic Commission for Europe (UNECE)) based on current knowledge, and are subject to regular review. The assessment approach is based around thresholds where the Process Contribution (PC) is only 1% of the CLs for international or nationally designated sites (and 100% of the CLs for locally designated sites). It is more of an insignificance threshold (i.e. below the threshold the contributions are so insignificant that they are considered inconsequential and a likely significant effect will not occur). Exceedance of the 1% of the CL threshold (or 100% for locally designated sites) does not in any event automatically mean that an adverse effect will occur, but provides a trigger for further assessment of the potential effect. Using a 1% of the CL threshold already builds in a large protective margin, and that margin is increased further where PCs are less than the 1% threshold.

G1.5.3 *Pollutant Sources and Background Levels*

G1.27 In considering the cumulative effects of several PCs from planned and proposed developments, it is also important to consider the main sources of pollution. The key pollutants assessed as part of the Project application are NO_x, and deposited nitrogen and acidity. Information about the current background levels / loads at the sites affected, and the sources of the contributing pollutants are available on APIS (<http://www.apis.ac.uk/>) for deposited nitrogen and acidity, and from Defra for northern England, which provides a reasonable indication (<https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2013>).

G1.28 It is clear from this information that the main contributors to the background levels / loads are from sources such as livestock, transport (e.g. shipping, road traffic), fertiliser imports, and from emissions from continental Europe. In the case of nutrient nitrogen and acidity, this can amount to approximately three quarters of the background loads. For example, the annual contributions to background nutrient nitrogen from sources other than those described above are well below the CL (min) for even the most sensitive habitat type affected at The Teesmouth and Cleveland Coast SPA (e.g. approximately 4 kg N/ha/yr, compared with a CL (min) of 8 kg N/ha/yr for supralittoral sediment), and only marginally above the CL (min) for bogs and montane habitat at the North York Moors SPA (approximately 6.5 kg N/ha/yr compared with a CL (min) of 5 kg N/ha/yr), and well below the CL (max) (10 kg N/ha/yr) for the same habitat type. The PCs from the Project are small (e.g. nutrient nitrogen contributions to the European sites from the proposed CCGT plant are around 0.03 / 0.04 kg N/ha/yr). These are peak loads and may be lower across parts of the European sites.

G1.29 Background levels / loads at the European sites can exceed the CLs already, as is the case at the European sites for some of the pollutant types assessed for

the Project. Even if several planned and proposed projects (all with PCs < 1% of CL) combine to be close to, or just exceed 1% of the CL, the contributions are still likely to be insignificant compared with the background, which is heavily influenced by the sources described above (e.g. agriculture, transport, transboundary sources). In cases where the background levels / loads are lower than the CL, there is less risk of effects in the first place by the small increases, even in-combination.

G1.30 In many cases now, newer more efficient power generation plant is being built and it will help reduce future pollution by replacing existing older plant ⁽¹⁾. The proposed Project is such an example, as it is a modern and more efficient plant which will replace the demolished CCGT plant which previously stood on the site. The Applicant's experience of the permitting requirements and design of new plant is that there is a real focus on achieving PC levels/loads which are < 1% of CL. Overall such insignificant contributions in-combination are also likely to remain insignificant. This approach has been accepted by Inspectors at Inquiries and Hearings.

G1.5.4 *Wider Air Quality Context*

As discussed above, the background NO_x, acid deposition and nutrient nitrogen deposition are derived from a large number of sources. Within this a significant proportion is derived from sources that are not local (i.e. within 15 km) and therefore it is important to consider the wider context in addition to the local context.

G1.31 In APIS there is detailed information available on the sources contributing to the baseline. It is noted that this is based upon an inventory from 2012, as by the nature of the data this will always be somewhat in arrears. However, in the case of the Teesside area this is a particularly important point. In the detailed source breakdown, emissions are included in the baseline from several large coal fired power stations, including Eggborough, Ferrybridge, Drax, Longannet, Fiddlers Ferry and Ratcliffe on Soar, as well as other large combustion processes. Due to the implementation of the requirements of the Industrial Emissions Directive (IED) and its predecessor the Large Combustion Plant Directive (LCPD), since 2012 these plants have either been subject to closure, or substantial reductions in emissions of NO_x and sulphur dioxide (SO₂). There are also policies and measures in place to further reduce emissions from other sources, including more stringent emission limits on vehicles and other industrial sources. Overall, the trend in the UK, and the European continent relevant to transboundary pollution, has been towards steadily improving air quality over the long term. This is particularly evident in the very considerable reductions in ambient SO₂ since the 1960-1980's, and the downward trend continues.

(1) It is possible that for some pollutants the data on background levels available do not take account yet of closure of some plants (e.g. large coal fired power stations), and reflect the improvements to air quality.

G1.32 The baseline is therefore not static, and the long term reduction in NO_x, acid deposition and nutrient nitrogen deposition cannot be ignored when considering the impacts of individual projects, or the in-combination effects of multiple projects. Undertaking a quantitative in-combination assessment of new projects within a 15 km radius of the Project, and assessing their impact assuming that there is a static baseline is not practical or appropriate. It is difficult to ascertain the exact pollution balance at a given habitat site, with the reductions in overall baseline and the increase due to new projects, but given the dominance of the baseline and the widespread reduction in emissions, it is reasonable to conclude that the overall trend will continue to be downward even if new projects contribute a net (aggregate for two projects or more) increase of >1% of the Critical Load.

G1.33 As a general rule, projects contributing >1% of the Critical Load at a habitat where the Critical Load is already exceeded will generally be required to take steps to reduce these impacts. Given the general level of industrial development, balanced against the continued downward trend in emissions and ambient airborne pollution it is reasonable to conclude that there are very few, if any, foreseeable circumstances where cumulative effects of multiple industrial developments will lead to a significant negative effect on a habitat in the long term.

G1.5.5 *Quantitative Cumulative Assessment*

G1.34 In addition to the overarching need question (see above), there are also practical difficulties with undertaking a detailed quantitative in-combination assessment. It is often difficult to obtain detailed quantitative information about other developments, if it has not been submitted with the application. Often the reports simply state PC contributions are <1% of PC. Even if more detailed information is available (modelled data) there can be difficulties in combining the data depending on the models used, assumptions which have been made etc. Given that the main contributors of pollutants are from more diffuse sources (e.g. livestock), or transboundary (e.g. from continental Europe), the scope of inputs into a meaningful in-combination model could be wide ranging.

G1.5.6 *Qualitative Cumulative Assessment*

G1.35 Notwithstanding the above considerations, *Chapter 7 (Air Quality)* of the ES identifies other planned and proposed projects that could have impacts on air quality and effects on ecology cumulatively with those from the Project.

G1.36 Following a detailed screening process for all potential cumulative schemes, three other proposed projects within a 15 km radius of the Project were identified as having the potential to lead to cumulative effects based on their likely scale of emissions to atmosphere:

- Norseia Pipelines Ltd (ConocoPhillips) CCGT/CHP facility at Seal Sands, north of the Tees;

- Thor Cogeneration plant also north of the Tees; and
- The MGT biomass facility south of the Tees.

- G1.37 Subsequently it was determined that the Thor Generation project had its licence revoked in August 2013.
(https://www.ofgem.gov.uk/sites/default/files/docs/2013/08/thor_cogeneration_limited_electricity-revocation-notice-not-supply.pdf); this project is therefore not considered further.
- G1.38 An Appropriate Assessment was undertaken by the Department of Energy and Climate Change (DECC) in April 2009 (Record of the Appropriate Assessment under Regulation 48(1) of the Conservation (Natural Habitats, &c.) Regulations 1994 for an Application under Section 36 of the Electricity Act 1989; Title of Application: 800 MW Combined Heat and Power Combined Cycle Gas Turbine Generating Station at Seal Sands, Teesside). The appropriate assessment considered all three of the above proposed project.
- G1.39 The assessment made the following conclusion:
- G1.40 With regard to the in-combination effects due to the deposition of nitrogen, this assessment demonstrates that the proposed development will not affect the integrity of the habitat of the Teesmouth and Cleveland Coast SPA and Ramsar site, even in the unlikely event that the ConocoPhillips CHP plant and those plants assessed in-combination, operated at full load continuously.
- G1.41 In regard to the MGT biomass facility, the Secretary of State's decision letter of 15th July 2009 stated the following with respect to effects on European (protected) sites.
- G1.42 The Secretary of State notes that the development is located near to the Teesmouth and Cleveland Coast Special Protection Area and Ramsar site and the Tees and Hartlepool Foreshore and Wetlands SSSI. However, he has been informed by Natural England that the location, scale and nature of the proposed development are such that it will not be likely to have a significant effect on their interest features and an "Appropriate Assessment" (AA) does not need to be undertaken by the Secretary of State pursuant to Regulation 48 of the 1994 Regulations.
- G1.43 Although the consent has been subsequently varied it is assumed that the above decision still applies.
- G1.44 Data on PCs from the above two projects for nationally and locally designated sites have not been obtained. However, taking into consideration the above decisions, and the revocation of the licence for the Thor Cogeneration project, this assessment assumes that these projects would make contributions to air quality impacts at nationally and locally designated sites that are of a similar scale or less to the PCs from the Project.

G1.45 While it is noted that for several sites the published backgrounds are above the CLs and that in theory a significant cumulative effect is being experienced by these sites, the contribution of the Project to the effects is negligible, for example ranging from 0.07% to 0.67% of the background. Although not quantified it is unlikely that the cumulative contributions of the Project and the other two planned and proposed projects would exceed 1% of background if at all.

G1.46 In summary the major influences on the nationally and locally designated sites are from other pollutant sources such as agriculture, transport, and transboundary pollution sources, and it is considered very unlikely that insignificant additions of air pollutants by the Project would combine with insignificant contributions from other proposed developments to result in likely significant effects on the sites.

G1.6 *SUMMARY*

G1.47 The screening assessment found no significant effects due to pollutant emissions from the Project alone on the interest features of the sites of national, or local nature conservation importance, and no potential for cumulative effects with other projects.