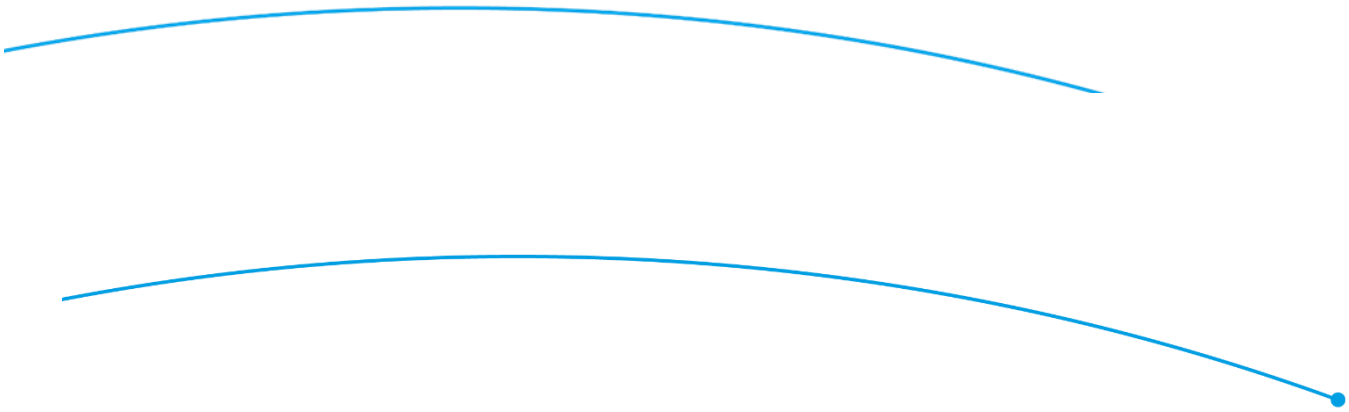
13 March 2025

Department for Energy Security & Net Zero

Habitats Regulations Assessment for an Application Under the Planning Act 2008

Regulation 63 of The Conservation of Habitats and Species Regulations 2017



Contents

List of abbreviations

Term	Abbreviation
(draft) Development Consent Order	(d)DCO
Adverse Effect on Integrity	AEoI
Air Pollution Information System	APIS
Appropriate Assessment	AA
Ammonia	NH_3
Best Available Techniques	BAT
Best Available Techniques Reference Document	BREF
Carbon Capture Utilisation and Storage Facility	CCUS
Code of Construction Practice	CoCP
Construction Ornithological Management Plan	COMP
Concrete Block Manufacturing Facility	CBMF
Construction Environment Management Plan	CEMP
Carbon Dioxide	CO_2
District Heat and Private Wire Network	DHPWN
Dust Management Plan	DMP
Ecological Clerk of Works	ECoW
Environment Agency	EA
Environmental Permit	EP
Environmental Statement	ES
European Economic Area states	EEA states
Examining Authority	ExA
ExA's written question	ExQ
Functionally Linked Land	FLL
Habitats Regulations Assessment	HRA

Hectares	ha
Historic England	HE
Hydrogen Chloride	HCl
Hydrogen Fluoride	HF
In-combination Effect	ICE
Institute of Air Quality Management	IAQM
Interested Parties	IPs
International Standards Organisation	ISO
Issue Specific Hearing	ISH
Joint Nature Conservation Committee	JNCC
Kilometre	km
Likely Significant Effect	LSE
Limits of Deviation	LoD
Mega Volt Amp	MVA
Megawatt Volt Amp	MW
National Site Network	NSN
Nationally Significant Infrastructure Project	NSIP
Natural England	NE
Nitrogen Oxides	NO_x
North Lincolnshire Council	NLC
Operational Environmental Management Plan	OEMP
The Planning Act 2008	PA2008
Planning Inspectorate	PINS
Plastic Recycling Facility	PRF
Predicted Environmental Contributions	PEC
Process Contributions	PC

Relevant Representation	RR
Report on the Implications for European Sites	RIES
Residual Derived Fuel	RDF
Special Area of Conservation	SAC
Special Protection Area	SPA
Statement of Common Ground	SoCG
Statutory Nature Conservation Body	SNCB
Sulphur Dioxide	SO_2
Supplementary Advice on Conservation Objectives	SACOs
World Health Organisation	WHO

Introduction

Background

This is a record of the Habitats Regulations Assessment (HRA) that the Secretary of State for Energy Security and Net Zero (the Secretary of State) has undertaken under the Conservation of Habitats and Species Regulations 2017[1] (the Habitats Regulations) as amended in respect of the Development Consent Order (DCO) for the North Lincolnshire Green Energy Park and its associated infrastructure (the Project). The Examining Authority (ExA) defines this as the "Proposed Development". It is defined as the Project within this HRA. For the purposes of these Regulations the Secretary of State is the competent authority.

The Project would comprise of the construction, operation, maintenance and decommissioning of an electricity generating station, fuelled by refuse derived fuels, with a capacity to process up to 760,000 tonnes of refuse derived fuels each year, producing a gross generation capacity of 95 megawatts (MW) at International Organisation of Standardisation (ISO) conditions.

The project would comprise of the electricity generation station with a battery storage facility capable of peak discharge of 30Mwe. In addition, there are plans for the addition of a Carbon Capture Utilisation and Storage (CCUS) facility; a concrete block making facility (CBMF); reinstatement of a railway line, and a Plastic Recycling Facility (PRF), amongst other associated and ancillary development. The project is described in more detail in Section 2.

The Project constitutes a nationally significant infrastructure project (NSIP) as defined by s. 14(1)(a) of the Planning Act 2008[2] as it is for an onshore generating station in England with a capacity over 50MW.

The Project was accepted by the Planning Inspectorate (PINS) on 27 June 2022 and a panel of two inspectors were appointed as the Examining Authority (ExA) on 19 August 2022 under s61 and s65 of the PA2008 [PD-005]. The Examination of the Project application began on 15 November 2022 and concluded on 15 May 2023. The ExA submitted its report of the Examination, including its recommendation (the ExA's Report) to the Secretary of State on 15 August 2023. Numbered references to the ExA's Report are presented in the format "[ER *.*.*]".

Following receipt of the ExA's Report the Secretary of State invited Interested Parties (IPs) to provide additional updates, information, and responses to information, including relating to potential impacts on qualifying features of UK National Site Network (NSN) sites. The Secretary of State's consultation letters referred to throughout this report are referenced in Section 0.

This HRA contains a consideration of the potential effects of the Project upon protected sites in European Economic Area (EEA) States (transboundary sites). This is recorded under the transboundary assessment section of the report (Section 0).

[1] https://www.legislation.gov.uk/uksi/2017/1012/contents/made

[2] http://www.legislation.gov.uk/ukpga/2008/29/contents

Habitats Regulations Assessment

The Habitats Regulations aim to ensure the long-term conservation of certain species and habitats by protecting them from possible adverse effects of plans and projects. In the UK, the Habitats Regulations apply as far as the 12 nautical miles (nm) limit of territorial waters.

The Habitats Regulations provide for the designation of sites for the protection of habitats and species of international importance. These sites are called Special Areas of Conservation (SACs). They also provide for the classification of sites for the protection of rare and vulnerable birds and for regularly occurring migratory species within the UK and internationally. These sites are called Special Protection Areas (SPAs). SACs and SPAs together form part of the UK's NSN.

The Convention on Wetlands of International Importance 1972 (the Ramsar Convention) provides for the listing of wetlands of international importance. These sites are called Ramsar sites. Government policy is to afford Ramsar sites in the United Kingdom the same protection as sites within the NSN (collectively referred to in this HRA as "protected sites").

Candidate SACs (cSACs), SACs and SPAs are afforded protection as protected sites. As a matter of policy[3] the Government affords potential SPAs (pSPAs) the same level of protection.

Regulation 63 of the Habitats Regulations provides that:

…before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which (a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in-combination with other plans or projects), and (b) is not directly connected with or necessary to the management of that site, [the competent authority] must make an appropriate assessment of the implications for that site in view of that site's Conservation Objectives.

And that:

In the light of the conclusions of the assessment, and subject to regulation 64 [IROPI], the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site or the European offshore marine site (as the case may be).

This Project is not directly connected with, or necessary to the management of a protected site. The Habitats Regulations require that, where the Project is likely to have a significant effect (LSE) on any such site, alone or in-combination with other plans and projects, an appropriate assessment (AA) is carried out to determine whether or not the Project will have an adverse effect on the integrity (AEoI) of the site in view of that site's Conservation Objectives. In this report, the following steps are referred to as the HRA:

- Stage 1: Assessment of LSE; and
- Stage 2: AA to determine whether there is an AEoI of any protected site.

[3] NPS EN-1 para 5.3.9

The Secretary of State has had regard to relevant guidance on the application of HRA published by the PINS (2022) (Advice Note 10)[4] , guidance produced by Defra (2012)[5] & (2021)[6] and the European Commission (2019)[7], together with recently published joint guidance by Defra, Natural England (NE), the Welsh Government and Natural Resources Wales (2021) on 'Habitats Regulations Assessment: protecting a European site' (the "2021 joint guidance)[8]. It is noted that the Defra (2012) guidance was withdrawn on 15 March 2021 and has subsequently been updated and replaced by the 2021 joint guidance.

There are no parallel consents required for the Project which would require additional HRA to be carried out by any other competent authority.

Site Conservation Objectives

Where an AA is required in respect of a protected site, regulation 63(1) of the Habitats Regulations requires that it be an AA of the implications of the plan or project for the site in view of its Conservation Objectives. Government guidance also recommends that in carrying out the LSE screening, applicants must check if the proposal could have a likely significant effect on a protected site that could affect its conservation objectives.

Defra guidance[9] indicates that disturbance to a species or deterioration of a protected site must be considered in relation to the integrity of that site and its conservation objectives. It states that *"the integrity of a site is the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was designated"*.

Conservation objectives have been established by NE. When met, each site will contribute to the overall favourable conservation status of the species or habitat feature across its natural range. Conservation objectives outline the desired state for a protected site, in terms of the interest features for which it has been designated. If these interest features are being managed in a way which maintains their nature conservation value, they are assessed as being in a 'favourable condition'. An AEoI is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of its designation. There are no set thresholds at which impacts on site integrity are considered adverse. This is a matter for interpretation on a site-by-site basis, depending on the designated feature and nature, scale, and significance of the impact.

---

[4] The Planning Inspectorate (2022): Advice Note Ten: Habitats Regulations Assessment Relevant to Nationally Significant Infrastructure Projects.

[5] Defra (2012) Habitats and Wild Birds Directives: Guidance on the application of article 6(4) Alternative solutions, imperative reasons of overriding public interest (IROPI) and compensatory measures.

[6] https://consult.defra.gov.uk/marine-planning-licensing-team/mpa-compensation-guidance-consultation/supporting_documents/mpacompensatorymeasuresbestpracticeguidance.pdf

[7] European Commission (2019) Managing Natura 2000 sites: The provisions of Article 6 of the Habitats Directive 92/43/EEC: https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/EN_art_6_guide_jun_2019.pdf

[8] Defra, NE, the Welsh Government and Natural Resources Wales (2021) 'Habitats Regulations Assessment: protecting a European site': https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site

[9] https://www.gov.uk/guidance/appropriate-assessment

NE has issued generic conservation objectives[10] which should be applied to each interest feature of the site. Supplementary advice on Conservation Objectives (SACOs) for each site underpins these generic objectives to provide site-specific information and give greater clarity to what might constitute an adverse effect on a site interest feature. SACOs are subject to availability and are updated on a rolling basis.

Where supplementary advice is not yet available for a site, NE advises that HRAs should use the generic objectives and apply them to the site-specific situation. For SPAs, the overarching objective is to avoid the deterioration of the habitats of qualifying features, and the significant disturbance of the qualifying features, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving the aims of the Habitats Regulations. This is achieved by, subject to natural change, maintaining and restoring:

- the extent and distribution of the habitats of the qualifying features;
- the structure and function of the habitats of the qualifying features;
- the supporting processes on which the habitats of the qualifying features rely;

the populations of each of the qualifying features; and

- the distribution of the qualifying features within the site.

For SACs, the overarching objective is to avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving favourable conservation status of each of the qualifying features. This is achieved by, subject to natural change, maintaining or restoring:

- the extent and distribution of the qualifying natural habitats and habitats of qualifying species;
- the structure and function (including typical species) of qualifying natural habitats;
- the structure and function of the habitats of qualifying species;
- the supporting processes on which qualifying natural habitats and habitats of qualifying species rely;
- the populations of qualifying species; and
- the distribution of qualifying species within the site.

A general summary of the relevant conservation objectives was set out in the updated Report to Inform Habitats Regulations Assessment [AS-023].

Neither NE's relevant representation [RR-090] nor the Original Report to Inform HRA [REP2-019] stated whether the protected sites (Listed Table 1) are in favourable or unfavourable condition. In response to ExQ1 (Q5.1.8 in [PD-007]), NE [REP2-100] confirmed that all protected sites considered are currently in unfavourable condition.

[10] https://publications.naturalengland.org.uk/category/5758332488908800

Although not explicitly stated that the conservation objectives for the Humber Estuary SPA and SAC have been applied to the Humber Estuary Ramsar Site, it has been implied throughout the Applicant's decision documents. Given the spatial overlap and consistency of the qualifying features between them, the ExA considered this an acceptable approach. The Secretary of State agrees.

The conservation objectives and, where available, SACOs have been used by the Secretary of State to consider whether the Project has the potential to have an AEoI of sites, either alone or in-combination with other plans or projects.

The SACOs relevant to this HRA Report, as published by NE and the Joint Nature Conservation Committee (JNCC), are referenced in Table 2.

The Report on the Implications for European Sites (RIES) and statutory consultation

Under Regulation 63 (3) of the Habitats Regulations the competent authority must, for the purposes of an AA, consult the statutory nature conservation body (SNCB) and have regard to any representation made by that body within such reasonable time as the authority specifies.

NE is the SNCB for England and for English waters within the 12 nm limit.

The ExA [ER 4.9.3] had been mindful throughout the Examination of the need to ensure that the Secretary of State has such information as may reasonably be required to carry out his duties as the competent authority. The ExA sought evidence from the Applicant and the relevant IPs, including NE, through written questions and oral questions at Issue Specific Hearings (ISHs).

The ExA, with support from the Inspectorate's Environmental Services Team, produced a Report on the Implications for European Site (the RIES) [PD-014]. The purpose of the RIES was to compile, document and signpost information submitted by the Applicant and IPs during the Examination (until Deadline 6 on 20 March 2023). It was issued to ensure that IPs, including NE as the SNCB under Regulation 5 of the Habitats Regulations, had been formally consulted on Habitats Regulations matters in respect of the Application for the Project during the Examination.

The RIES was published on the PINS NSIP web page[11] and the ExA notified IPs that it had been published. Consultation on the RIES was undertaken between 6 April 2023 and 28 April 2023. The Applicant [REP8-021], NE [REP8-036], the EA [REP8-034] and one IP (Amy-Louise Ogman) [REP8-028] provided comments on the RIES at Deadline 8 (28 April 2023).

The ExA recommended [ER 6.1.7] that the RIES, and consultation on it, may be relied upon by the Secretary of State as an appropriate body of information to fulfil his duties under Regulation 63(3) of the Habitats Regulations. He agrees with the ExA in this regard.

Structure of this HRA

The remainder of this HRA Report is presented as follows:

11 https://infrastructure.planninginspectorate.gov.uk/projects/yorkshire-and-the-humber/north-lincolnshire-green-energy-park/?ipcsection=docs

- Section 0: provides a general description of the Project;
- Section 0: presents an assessment of the extent to which the Project is likely to have a significant effect on protected sites and qualifying features on its own or in-combination with other plans or projects;
- Section 0: presents an AA of the effects of the Project on protected sites and qualifying features, on its own and in-combination with other plans or projects;
- Section 0: presents a consideration of transboundary impacts; and
- Section 0: presents the Secretary of State's conclusions.

Project Description

The Project is an Energy Recovery Facility (ERF), fuelled by refuse derived fuel (RDF) with a gross generation capacity of up to 95 MW at ISO conditions. The Project comprises of:

- Three emissions stacks, consisting of the ERF stack windshield, back up boilers stack windshield and back-up generator stack, and associated emissions monitoring system.
- CCUS facility capable of capturing at least 54,387 tonnes of carbon dioxide (CO_2) per annum including carbon dioxide storage tanks.
- A visitors' centre containing offices, exhibition space and visitor accommodation with elevated walkway.
- A cooling system consisting of air-cooled condensers or air blast chillers
- A bottom ash and flue gas residue handling and treatment facility.
- A concrete block manufacturing facility (CBMF).
- Reinstatement of the railway line between Flixborough Wharf and the Dragonby sidings including new sidings and railhead.
- A Plastic Recycling Facility (PRF) and associated infrastructure.
- A new access road linking the B1216 and Stather Road, and improvements to footpaths.
- A hydrogen electrolyser, and associated infrastructure required to inject hydrogen into the national gas grid.
- An electric and hydrogen vehicle refuelling station.
- A battery storage facility of peak discharge of 30Mwe, and associated infrastructure.
- A District Heat and Private Wire Network (DHPWN).
- Diversions of existing utilities.

- Hard and soft landscaping, including habitat creation measures and biodiversity enhancements.
- Flood defences and sustainable drainage systems.
- Construction laydown areas.

The Project also includes a new connection to the electricity grid to allow the exportation of the generated electricity – plans of which can be found within [REP5-014]. The Grid Connection Letter [REP1-017] and Grid Connection Statement [APP-039] confirms the plans to facilitate a total site import of 50 Mega Volt Amp (MVA) and export of 95 MW.

The Applicant assessed [REP6-014] that decommissioning activities would be similar in approach and scale to those during the construction phase, and that any effects from decommissioning would be addressed in full by the competent authority closer to the time when it may occur, based on more specific information about the activities and processes involved, and also the prevailing environmental conditions.

Chapters 2 [APP-050] and 3 [APP-051] of the Applicant's ES provide a characterisation of the location and full description of the Project respectively, including the design parameters used for the ES assessment.

Project location

The land for the project is entirely within the administrative area of North Lincolnshire Council (NLC) (wholly in England), and is divided into four distinct geographical areas, each of which corresponds to a specific element of the Project. These are the Energy Park Land; the Northern DHPWN Land; the Southern DHPWN Land and the Railway Reinstatement Land. The red line boundary for the project can be seen in Figure 1.

The Energy Park Land is located on land within, and to the south of Flixborough Industrial Estate, to the west of Scunthorpe, North Lincolnshire. It encompasses an area within, and adjacent to Flixborough Wharf on the east bank of the River Trent. Together the Industrial Estate and Wharf form an industrial complex that has supported a range of businesses and industrial activities since the early 1900's. Current infrastructure on the site includes roads, a rail spur, 155m long Wharf, weigh bridge, cranes, warehousing and stock sheds, workshops, and portable offices. The wider industrial estate houses cement works, wind turbines, grain processing facilities, and a small power station that has a feedstock of chicken litter and bone meal. The area surrounding the industrial estate but is still in the order limits is a mix of brownfield and arable land, with hedgerows and well-established drainage ditches.

The Northern DHPWN runs from the main ERF Facility to a new access road at the southern end of the land, where the B1216 (Ferry Road West) meets the A1077 (Phoenix Parkway). The route passes through common land, Foxhills Industrial Park, rough grassland with hedges, and agricultural land.

The Southern DHPWN runs from the southern end of the Energy Park Land, where the B1216 (Ferry Road West) meets the A1077 (Phoenix Parkway), and then heads south through the agricultural land land on the west side of the A1077, passing under a drain. Further on, the

network will pass under under the carriageway at Doncaster Road, and under the Crowle to Scunthorpe railway line and terminate in the field to the north of the B1450 (Burringham Road).

The Railway Reinstatement Land comprises of the disused railway line between the main Network Rail line at Dragonby and the Wharf at Flixborough. The line delivered steel and other materials to and from British Steel at Scunthorpe, up to its closure in 2012. The line runs in a roughly east-west direction, and is located between a mix of industrial developments and arable agricultural land. Much of the line is lined by trees. After looping around, it terminates at the Wharf edge in the Flixborough Industrial Estate.

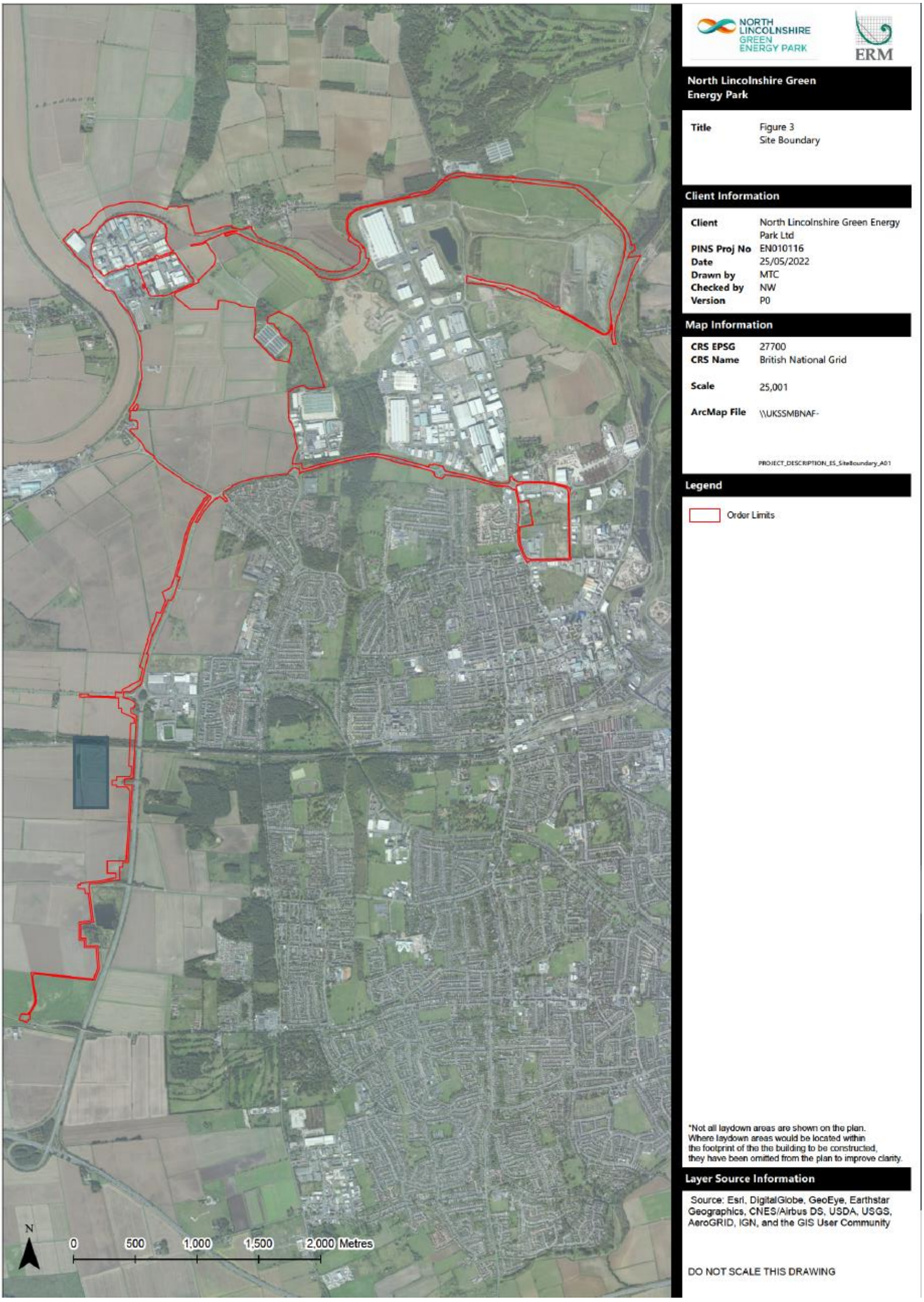


Figure 1: The Order Limits of the Project at Application

Changes to the Application during Examination

There were no changes made during Examination that would materially change the application.

Documents referred to in this HRA

This HRA has taken account of, and should be read in conjunction with, the documents produced as part of the Application and Examination which are available on the PINS NSIP web page[11].

In particular:

- The ExA's Report;
- The RIES [PD-014].
- The Applicant's assessment of effects, including:
  - Document 5.9: Report to Inform Habitats Regulation Assessment [APP-023]
  - Document 5.9: Report to Inform Habitats Regulation Assessment (Updated) [REP6-014]
  - The Applicants' Environmental Statement (ES)
- The Relevant Representation published by NE [RR-090]
- The final Statement of Common Ground (SoCG) with NE [REP10-010]; and
- The responses to the Secretary of State's consultation letters (the consultation letters), published on:
  - 22 September 2023 [12];
  - 8 December 2023[13]; and
  - 14 February 2024 [14];

Plus, other information submitted during the Examination and during the Secretary of State's consideration of the Project. Key information from these documents is summarised in this HRA.

Stage 1: Screening for Likely Significant Effects

Under regulation 63 of the Habitats Regulations, the Secretary of State must consider whether a development will have an LSE on a protected site, either alone or in-combination with other plans or projects.

[12]https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010116/EN010116-001388-230922_North%20Lincolnshire%20Green%20Energy%20Park%20Consultation%20Letter.pdf

[13]https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010116/EN010116-001413-231208_Final_North%20Lincolnshire%20Green%20Energy%20Park_Second%20Consultation%20Letter.pdf

[14]https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010116/EN010116-001421-220214_North%20Lincolnshire%20Green%20Energy%20Park_Third%20Consultation%20Letter.pdf

The purpose of this section is to identify any LSEs on protected sites that may result from the Project and to record the Secretary of State's conclusions on the need for an AA.

Protected sites

The Project is not directly connected with, or necessary to, the management of a protected site. The application site is within the zone of influence of six protected sites. NE (Q2.1.1 in [REP8-036]) agreed on the list of sites, and that the correct features were listed in Table 4 of ROC Report to Inform HRA [AS-023].

Sections 2.2, 3.3 and 3.4 of [AS-023] described the process used to identify sites and features for inclusion in the assessment. The Applicant used information gained from consultation with NE to decide on a screening radius of 15 kilometres (km) from the main emission source at the ERF. This is in line with EA guidance[15] on large power generation developments greater than 50 MW.

Although slightly outside the 15km radius, in pre application consultation NE expressed concern over the exclusion of Hatfield Moor SAC, which had habitats that were deemed to be sensitive due to the nature of the Project. As a result, the Applicant added Hatfield Moor SAC into its air quality modelling (Table 2, [AS-023]).

A 30 km radius was used for SACs for which bats are a qualifying feature, due to bat foraging distances, but no such SACs were identified within this 30 km radius.

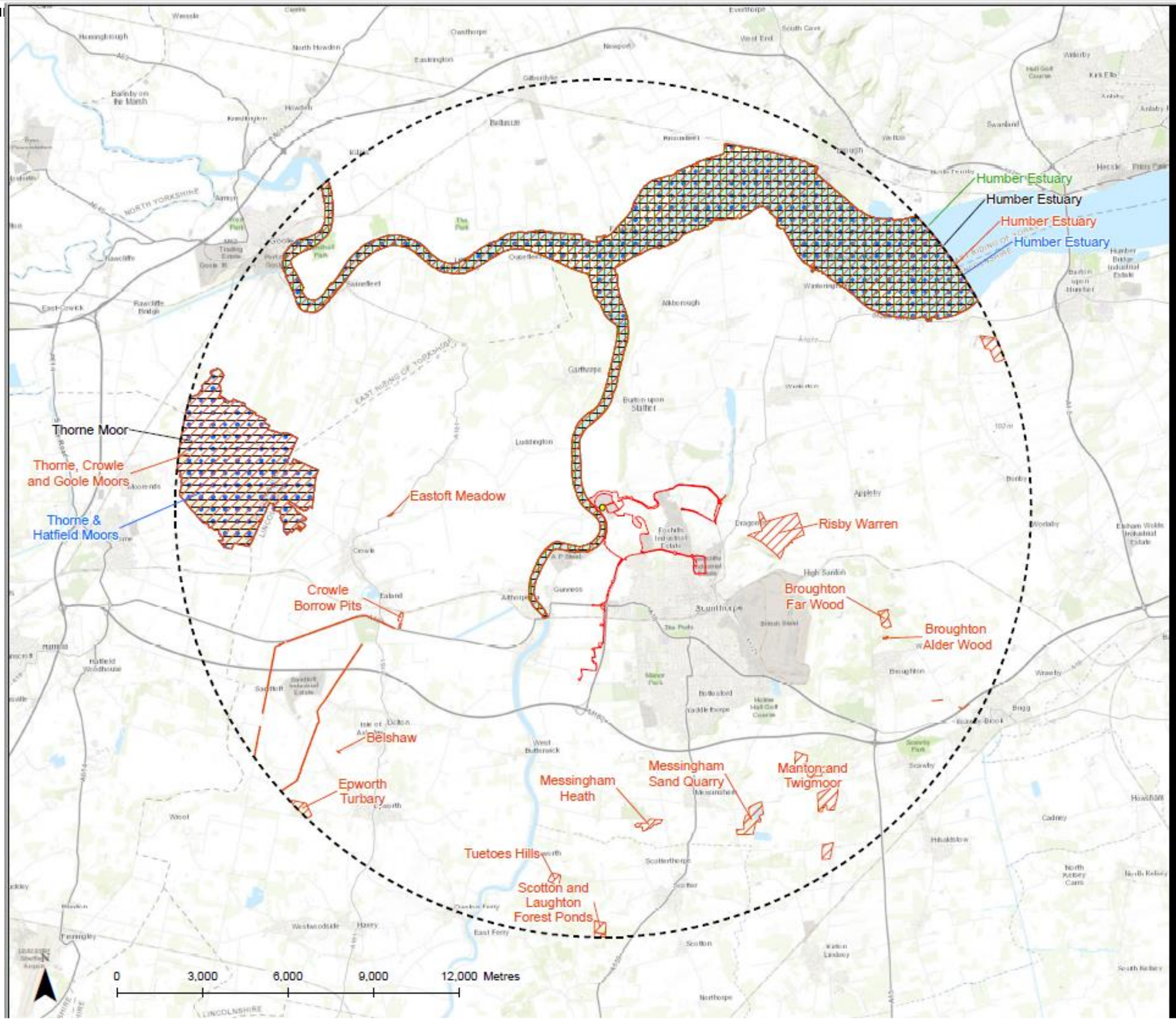
For the screening, atmospheric dispersion modelling was undertaken to predict the short and long-term Process Contributions (PC) against the respective standard. These were then compared against the critical loads set out for each habitat in the Defra/EA guidance. Further details on how these were assessed can be found in [APP-053].

Ecological surveys have been undertaken of the Order limits and appropriate zones of influence. The results of these surveys are presented in Technical Appendix B of the ES Ecology and Nature Conservation Chapter [APP-058].

A map showing the Protected Sites located within the screening buffer can be seen below (Figure 2).

[15] Environment Agency (2023). Air emissions risk assessment for your environmental permit. Available online: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

Figu



NORTH LINCOLNSHIRE GREEN ENERGY PARK

ERM

North Lincolnshire Green Energy Park

Title	Figure 4 European Sites

Client Information

Client	North Lincolnshire Green Energy Park Ltd.
PINS Proj No	EN010116
Date	16/03/2022
Drawn by	MTC
Checked by	SD
Version	P0

Map Information

CRS EPSG	27700
CRS Name	British National Grid
Scale	120,000
ArcMap File	\\UKSSMBNAF-

Legend

- Stack Location
- Order Limits
- 15km Buffer from Stack Location
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Ramsar Site
- Special Protection Area (SPA)

Layer Source Information

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c)

DO NOT SCALE THIS DRAWING

Table 1 shows the protected sites that the Applicant screened in, and their distance from the ERF stack:

Table 1: Protected sites screened in by the Applicant, ordered by increasing distance from the ERF stack.

Name of protected site	Distance from ERF Stack
Humber Estuary SAC	0.1 km west
Humber Estuary SPA	6.5 km north
Humber Estuary Ramsar	0.1 km west
Thorne Moor SAC	10.1 km west
Thorne and Hatfield Moors SPA	10.1 km west
Hatfield Moor SAC	Just over 15 km

The potential impacts from the Project on the protected sites, and their geographical extents are identified in Sections 3 and 4 of the Original Report to Inform HRA [REP2-019].

Table 1 of Appendix 1 of [REP2-019] sets out the potential impact pathways of the Project, and included:

- emissions to air (operation);
- disturbance or displacement of qualifying bird features (construction, operation, and decommissioning);
- disturbance or displacement of qualifying bird features using FLL (construction, operation, and decommissioning);
- recreational disturbance of qualifying bird features (construction, operation, and decommissioning);
- changes to water quality (construction, operation, and decommissioning); and
- changes to air quality (dust) (construction and decommissioning).

In response to comments from NE and the ExA, the following impact pathways were added to the ROC Report to Inform HRA [AS-016], during the Examination:

- construction and operational phase traffic emissions;

- noise and vibration from construction activities and vessel movements on river and sea lamprey; and
- loss of Functionally Linked Land (FLL).

The Applicant considered that the potential impacts from decommissioning to be similar in scale to those of construction [REP6-014], noting any effects from decommissioning would be addressed in full by the competent authority closer to the time.

Although noted in the pre-consultation that Hatfield Moor SAC sat just outside the 15km radius from the main emission stack, air quality modelling showed that there was no potential for a significant effect at this distance from the stack, and therefore Hatfield Moor SAC could be screened out, and not considered further. In response to ExA questioning, (ExQ1, Q5.0.2 in [PD-007]), NE confirmed [REP2-100] that they were satisfied with this approach.

Thorne Moor SAC and Thorne and Hatfield Moors SPA were also screened for operational emissions to air. However, the air quality modelling found in the Original Report to Inform HRA [REP2-019] showed that none of the PC's for the assessed pollutants exceeded 1% of the critical load screening threshold (or 10% for NO_X 24 Hour) for the Project. This approach was accepted by NE [RR-090].

The ExA was also satisfied that there would be no LSEs alone to Hatfield Moor SAC, Thorne Moor SAC and Thorne and Hatfield Moors SPA (ExA Report 6.2.11).

The Secretary of State believes these parameters are fair, and that LSEs can be excluded for these sites.

Table 2: Protected Sites for which the Secretary of State cannot exclude LSEs, either alone or in-combination

Protected Site	Distance from protected site boundary to the Project	Supplementary Advice on Conservation Objectives (SACOs)	Qualifying Features of Interest
Humber Estuary SAC	0.1 km west	See Footnote[16]	**Annex I habitats that are a primary reason for selection of the site:** H1130: Estuaries H1140: Mudflats and sandflats not covered by seawater at low tide **Annex I habitats and Annex II species present as a qualifying feature, but not a primary reason for site selection:** H1110: Sandbanks which are slightly covered by sea water all the time H1150: Coastal lagoons H1310: *Salicornia* and other annuals colonising mud and sand H1330: Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) H2110: Embryonic shifting dunes H2120: Shifting dunes along the shoreline with *Ammophila arenaria* (marram grass) (“white dunes”) H2130: Fixed coastal dunes with herbaceous vegetation (“grey dunes”) H2160: Dunes with *Hippophae rhamnoides* (sea buckthorn) S1095: Sea lamprey (*Petromyzon marinus*) S1099: River lamprey (*Lampetra fluviatilis*) S1364: Grey seal (*Halichoerus grypus*)
Humber Estuary Ramsar	0.1 km west	N/A	Near natural estuary, supporting dune systems, estuarine waters, intertidal mud and sand flats, saltmarshes and saline lagoons. The Humber Estuary supports a breeding colony of grey seals at Donna Nook and a breeding site for natterjack toad in the dune slacks at Saltfleetby-Theddlethorpe. It is an important migration route for river and sea lamprey and supports an assemblage of waterfowl of international importance. Individual water bird qualifying species are: common shelduck (*Tadorna tadorna*), golden plover (*Pluvialis apricaria*), red knot (*Caladris canutus*), dunlin (*Caladris alpina*), black tailed godwit (*Limosa limosa*), bar-tailed godwit (*Limosa lapponica*) and common redshank (*Tringa totanus*).
Humber Estuary SPA	6.5 km north	See Footnote[17]	**Annex I Species:** avocet (*Recurvirostra avosetta*), great bittern (*Botaurus stellaris*), hen harrier (*Circus cyaneus*), golden plover, bar-tailed godwit, ruff (*Philomachus pugnax*), Eurasian marsh harrier (*Circus aeruginosus*) and little tern (*Sterna albifrons*). **Regularly Occurring Migratory Species:** common shelduck, knot, dunlin, black tailed godwit and redshank. **Waterbird Assemblage:** 153,934 individual waterbirds (non-breeding) including pink-footed goose *(Anser brachyrhynchus)*, dark-bellied brent goose (*Branta bernicla bernicla*), shelduck, wigeon (*Anas penelope*), teal

[16] https://publications.naturalengland.org.uk/publication/5009545743040512

[17] https://publications.naturalengland.org.uk/publication/5382184353398784

			(*Anas crecca*), mallard (*Anas platyrhynchos*), pochard (*Aythya ferina*), scaup (*Aythya marila*), goldeneye (*Bucephala clangula*), great bittern, oystercatcher (*Haematopus ostralegus*), avocet, ringed plover (*Charadrius hiaticula*), golden plover, grey plover (*Pluvialis squatarola*), lapwing (*Vanellus vanellus*), knot, sanderling (*Calidris alba*), dunlin, ruff, black-tailed godwit, bar-tailed godwit, whimbrel (*Numenius phaeopus*), curlew (*Numenius arquata*), redshank, greenshank (*Tringa nebularia*) and turnstone (*Arenaria interpres*).
Thorne Moor SAC	10.1 km west	See Footnote[18]	**Annex I habitats that are a primary reason for selection of the site:** 7120: Degraded raised bogs still capable of natural regeneration
Thorne and Hatfield Moors SPA	10.1 km west	See Footnote[19]	**Annex I Species:** European nightjar (*Caprimulgus europaeus*) - breeding

[18] https://publications.naturalengland.org.uk/publication/6566028335120384

[19] https://publications.naturalengland.org.uk/publication/6503407711944704

A notable potential impact on the protected sites is the impact of the ERF's emissions produced during operation. Table 3 identifies the qualifying features which are sensitive to air emissions.

Table 3: Table showing the sensitivity of the qualifying features of the protected sites to nitrogen and acid.

Designated Site	Qualifying Annex I Habitats and Annex II Species	Sensitive to nitrogen	Sensitive to acidity
Humber Estuary SAC/Ramsar	Estuaries	✓	✗
	Atlantic salt meadows	✓	✗
Humber Estuary Ramsar	Bird species including black tailed godwit & golden plover	✓	✗
Humber Estuary SPA	Bird species, including avocet, black tailed godwit, curlew, dark-bellied brent goose, golden plover, great bittern, little tern, marsh harrier & wigeon	✓	✗
Thorne Moor SAC	Degraded raised bogs still capable of natural regeneration	✓	✓
Thorne and Hatfield Moors SPA	European nightjar	✓	✗

The Secretary of State has considered the potential effects of the Project on all qualifying features of the protected sites, taking into account their Conservation Objectives, to determine whether there will be LSEs.

With regards to the ruling of the European Court of Justice (ECJ) in People Over Wind, Peter Sweetman v Coillte Teoranta (C-323/17) (the "Sweetman Judgement)[20], in reaching his conclusions regarding LSE, the Secretary of State took no account of measures intended to avoid or reduce effects on any protected site during the screening stage of the off this assessment.

Likely Significant Effects from the Project Alone

Humber Estuary SAC and Ramsar site – Emissions to air

Operation

[20] ECJ case reference C-323/17, available: http://curia.europa.eu/juris/document/document.jsf?docid=200970&doclang=EN

The Applicant's Original Report to Inform HRA [REP2-019] assessed that there could be LSE from the Project alone from air pollution. Specifically for 24-hour nitrous oxides (NO_x), ammonia (NH_3) and nitrogen deposition.

This assessment, as well as the assessment in [AS-016] used atmospheric modelling to predict short and long-term PC's and predicted environmental contributions (PEC) from the Project. These were compared against the critical level and load for each habitat, as reported in Defra background mapping and the Air Pollution Information System (APIS) (provided in [REP2-041]).

APIS does not cover Ramsar sites and therefore the Applicant's modelling results for the Humber Estuary SAC and SPA were applied to the Ramsar, which protects the same habitats and species. NE agreed with this approach, due to the similar underlying habitat [REP8-036].

Using this original modelling, the ExA screened out LSEs from sulphur dioxide (SO_2), hydrogen fluoride (HF), and acid, as the PC was <1% of the critical level (and <10% of the critical level for HF) [REP2-019]. Also, LSEs were screened out for NO_x, with the modelling reporting that the PEC for NO_x annual mean showing it would be below the 70% of the critical level threshold.

NE had concerns about the original results from the screening [RR-090], believing they showed potential of causing an AEoI on the Humber Estuary SAC and Ramsar site from NH_3 emissions and nitrogen deposition.

When ammonia and other nitrogen containing compounds are deposited on sensitive habitats like the Humber Estuary SAC and Ramsar site, the specific species composition can be altered dramatically. Common fast-growing species that are adapted to areas with high nutrient availability outcompete the native flora, and the acidification of the soil can damage plants that remain, increasing their susceptibility to drought, pests, and frost[21] Mosses and lichens can be particularly affected[22].

In response to NE's concerns, the Applicant stated that the modelling performed has been precautionary with multiple 'worst case' scenarios and asserted that the project would (like most ERF plants) operate at much lower ammonia limits than those in the Best Available Techniques Reference (BREF) documents that were used in modelling [REP2-034]. They continued explaining that the lower NH_3 emissions would also result in reduced levels of nitrogen deposition.

For example, the Applicant noted that their original modelling included emissions from 100% of their RDF arriving by road, 100% by rail, and 100% by ship, whereas in reality there would be a modal split.

---

[21] Bobbink, R., et al. "Global Assessment of Nitrogen Deposition Effects on Terrestrial Plant Diversity: A Synthesis." Ecological Applications, vol. 20, no. 1, Jan. 2010, pp. 30–59, esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/08-1140.1, https://doi.org/10.1890/08-1140.1.

[22] Stevens, C. J. "Impact of Nitrogen Deposition on the Species Richness of Grasslands." Science, vol. 303, no. 5665, 19 Mar. 2004, pp. 1876–1879.

The Applicant committed to achieving specific NH_3 levels during operation [REP4-021], and laid out plans to carry out modelling, which would show (in their estimation) a more realistic operating scenario.

The ExA questioned this approach, querying how any parameters in this updated modelling could be secured (Q2.5.1.2 in [PD-012]).

NE [REP4-021] responded that while they welcomed the opportunity to review any updated modelling, they would require any measures used in the updated modelling to be secured in the DCO, as the HRA cannot use unsecured mechanisms such as the Environmental Permit (EP). The Applicant asserted (Q2.5.1.2 in [REP6-032]) that it would be inappropriate to secure any one parameter of any updated modelling, as at any one time one parameter may exceed the value used in the ROC whilst another may be below the value.

In terms of the EP, at the close of examination the Secretary of State noted that the Applicant had not yet applied to the Environment Agency (EA) for the necessary EPs, in accordance with the good practice recommended in PINS Advice Note 11, Annex D3. In their letter dated 22nd September 2023, the Secretary of State wrote to the Applicant asking for an update on the progress of securing the EP. In response the Applicant stated that they had begun a 'Permit and Consenting Strategy document' with the EA, and that development of the ERF permit application has commenced and remains ongoing. They also noted that NE will be a primary consultee within the permitting process and will need to be satisfied that the necessary considerations and measures have been applied in the design and included in the permitting conditions to ensure that effects on protected sites and species are within acceptable levels.

Later in the ExA's examination the Applicant produced their updated air emission modelling, which they named the 'Reasonable Operating Case (ROC)'. The modelling was included in their updated shadow HRA - the ROC Report to Inform HRA [AS-023]. The updated modelling is based on EA annual performance data - 2021 Incineration Monitoring Reports – which the Applicant had extrapolated for NO_x and NH_3 emissions, to meet upcoming BREF limits which they expect to be the limits used by the EA in the environmental permitting process.

The EA were asked (Q2.5.2 in [PD-014]) on their view on the suitability of the ERF performance data as a proxy for the expected emissions' limits for NO_x and NH_3 to be established through a future EP. The EA (Q5.1.3 in [REP8-034]) advised that when considering the provision of the EP it would ensure Best Available Techniques (BAT) are used. It confirmed that there are BAT Associated Emissions Limits for NO_x that must be met as a minimum requirement but for NH_3, it would expect the Applicant to propose a limit that is justified as BAT in the context of predicted impacts. The EA also confirmed that while their view could change when the permit application was received, that they were not currently aware of anything thing that would preclude the granting of an EP [REP8-034].

In a later consultation letter[13] the Secretary of State asked the EA for its views on the suitability of the ROC as a basis for the assessment of emissions to the air. The EA

responded on 19 December 2023[23] that they could not comment on this matter until a permit application had been received that confirmed the technology to be used and its performance. The ExA noted Overarching Energy National Policy Statement (NPS EN-1) which states that it should be assumed that the environmental regulatory regime will be properly applied and enforced.

The results of the modelling in the ROC Report to Inform HRA were different to those in the Original Report to Inform HRA. In their updated report, the Applicant assessed that LSE could now be screened out for the Humber Estuary SAC and Ramsar site.

The parameters used in the updated modelling are laid out in Appendix 1 of [AS-023] and included:

- Emissions of hydrogen chloride (HCl), SO_2, NO_x and NH_3 were amended from the BREF emissions limits, to the likely actual emissions based on the ERF performance data produced by the EA. For some pollutants, no changes were seen (NO_x), but others significantly reduced (HCl, SO_2, and NH_3) in the updated modelling.
- Operating hours reduced from 24 hours per day all year at full load to 8,000 hours per annum at full load.
- The modal split of 100% of material movements coming in from road, 100% by rail, and 100% by vessel was reduced. The new modelling assessed for 50% by road (confirmed by the Applicant in (Q2.5.5 in [REP8-021]), 24% by vessel (290 ships/year) and the remaining 26% by rail (one train per day).
- Road traffic modelling was altered to show the impact of removing the existing Flixborough Industrial Estate access road and replacing it with the new planned access road.

The worst-case meteorological data was still used.

The Applicant [AS-023] also used a revised standard for NO_x in the updated modelling, comprising short term NO_x emissions considered against a standard of 200 µg m^3 instead of a daily NO_x (24 hours) against a standard of 75 µg m^3, which the Applicant stated is more in line with Institute of Air Quality Management (IAQM) guidance[24] and more appropriate because of existing lower levels of SO_2 in the UK.

[23] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010116/EN010116-001414-Environment%20Agency%20-%20SoS%20Consultation%202%20response.pdf

[24] IAQM, A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites, version 1.1 (May 2020).

The ExA questioned the use of the new standards compared to the original critical loads which used in the Air Pollution Information System (APIS) (Q2.5.9 in [PD-014]). The Applicant [REP8-021] reiterated its original explanation, referring to World Health Organisation (WHO) guidelines which state "*experimental evidence exists that the critical load decreases from around 200 µg m^3 to 75 µg m^3 when in-combination with O_3 or SO_2 at or above their critical levels… If a regulator does require the use of the short-term NO_x critical level, given the low UK SO_2 concentrations IAQM consider it is most appropriate to use 200 µg m_3 as the short term critical load."*

NE [REP8-036] confirmed that it had reached its decision on NO_x based on the annual emission period, which provides for a more accurate consideration of potential for long term impacts, i.e. it did not consider the short-term standard.

In terms of general air quality emissions, NE stated in Q2.5.7 [REP8-036] that they were satisfied by the parameters used by the Applicant in their updated ROC modelling and were happy to use the figures in the ROC for the basis of their analysis of the potential impacts from the Project.

However, the Secretary of State disagrees with NE's approach to assessing the potential impacts. As recommended in PINS Advice Note Nine[25], the Secretary of State must make his assessment based on an appropriate 'worst case' scenario.

Whilst the Secretary of State recognises that the emissions predicted in the ROC are reasonable, they do not constitute a 'worst case' analysis. Additionally, the Applicant stated in [REP8-020] that the thresholds imposed in the ROC could not necessarily all be met at the same time, and in [REP8-020] stated that the figures displayed in the ROC were not levels that they wished to adhere to through the thresholds imposed through Requirements in the DCO. Furthermore, the Applicant confirmed in ExQ3 [PD-015] that the ROC was only ever meant to be used as information only, and not to be used to secure any conditions. They affirmed [REP8-021] the Project would *"…require a degree of headroom in emissions limits to avoid exceeding these within normal fluctuations of plant operations*.", and to avoid 'unduly constraining the Proposed Development'. Furthermore, while the Applicant and NE assure that the EP process will ensure restricted emission levels from the ERF stack, the ExA note that other types of emissions will not be taken into account during the EP process, nor any other consenting process, such as transport emissions associated with material movements.

Finally, the ExA raise the concern that as drafted, the dDCO [REP10-004], would authorise development capable of operating on the basis of the worst case scenario reported in [REP2-019]. The Secretary of State shares these concerns.

These points have led the Secretary of State to the decision that he must not include the ROC figures when undertaking the HRA.

From this point forward, all air emissions figures will be those used in the Original Report to Inform HRA, which uses the air quality monitoring described in Chapter 5 of

25 https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-nine-rochdale-envelope/

the Environmental Statement [APP-053], and not the modelling found in the ROC Report to Inform HRA, which used modelling described in Appendix 1 of [AS-023]. The only exception is when the Secretary of State considers the effects of emissions to air in-combination with Keadby 2 and 3 power stations. This is because the ROC modelling uses actual figures secured from Keadby 2's EP, which was granted by the EA in November 2020[26]. For all other cases, the Secretary of State uses the original modelling.

Using the original air quality modelling, the ExA believe that LSEs for NH_3 and nitrogen deposition from the Project cannot be excluded for the Humber Estuary SAC and Ramsar site, due to the PC for each pollutant exceeding 1% of the critical load, and the PEC exceeding the 70% threshold.

This is a conclusion that the Secretary of State is satisfied with, and this matter will be taken forward to the AA.

Humber Estuary Ramsar site qualifying bird species - Noise and vibration

Construction and Decommissioning

The Extended Phase 1 Habitat surveys carried out on behalf of the Applicant concluded that there is little suitable habitat for qualifying bird species within the Order Limits.

They assessed this as the habitats include intensively managed arable farmland with associated field drains and hedgerows which provide limited refuge or foraging habitat for the waterbirds listed under the Humber Estuary Ramsar or SPA designation.

However, mallard were repeatedly recorded on the Energy Park Land in surveys in 2018, 2019, and 2020[27]. The birds were observed roosting and feeding along the immediate banks of the River Trent outside the Order Limits. The original report to inform HRA [AS-023] screened in disturbance to mallard but the surveys referred to in the ES Ecology chapter [APP-058] suggested that mallard populations were limited, and highly mobile.

The Applicant also concluded that the raised embankments along the River Trent also provide a level of screening for the mallards, who would likely already likely have a high tolerance to disturbance as they live in an already very industrialised area.

Finally, the Applicant took the view that if disturbed, the birds would be able to move to the nearby large areas of estuarine and arable farmland habitat.

However, NE were not satisfied with this conclusion [RR-090], and requested further information, specifically:

- an assessment of noise impacts from construction works such as piling;
- an assessment of visual disturbance during operation;

[26] https://assets.publishing.service.gov.uk/media/5fbe3290d3bf7f573228a3fc/Decision_Document.pdf

[27] Bowland Ecology 2021. Identification of Functionally Linked Land supporting SPA waterbirds in the North West of England. NERC361. Natural England

- information on disturbance from traffic and human presence on wintering birds; and
- reinstatement of a Construction Ornithological Management Plan (COMP).

In [REP4-021], the Applicant assessed that the bored piling due to be used during the construction and decommissioning would not result in significant effects to the birds.

The noise levels along the River Trent would be around 50dB (decibel) L_{Aeq}, 12_{hr} , which is a level that the applicant concluded there would be no significant harm to the birds. The Applicant stated that there would also be moments were the noise levels would be elevated (e.g. when breaking concrete) but that the use of hoardings would mitigate this.

However, at D5, the Applicant acknowledged that they could not exclude the possibility that impact piling may have to be undertaken for short durations [REP5-001, REP5-021]. Given this, the Applicant updated the Code of Construction Practice (CoCP) [REP5-021] to include an Outline Construction Ornithology Management Plan (Annex M). This includes specific restrictions and procedures (in consultation with NE) that are to be undertaken if impact piling is to be used.

The Applicant furthered its position, stating that the noise would not have a significant effect on the birds as it would be a consistent noise (due to there being a range of construction activities taking place at the same time) as opposed to the more harmful 'startling' noises, such as those that would arise with percussive/driven piling. Furthermore in [REP6-014] the applicant confirmed that the only birds in the waterbird assemblage that would be exposed to areas were predicted noise levels could be above the 55dBL $_{Aeq}$, limit would be wintering mallard. Noise effects from impact piling were not assessed.

In response to queries by IP Amy-Louise Ogman [REP8-028] on the piling methods being used and further confirmation from NE (Q2.5.1.6 in [REP6-041]) that there needed to be a full assessment of piling, the Applicant submitted an updated Report to Inform HRA [AS-023]. This included an assessment of impact piling which concluded that there were LSE on the waterbird assemblage qualifying feature from piling during construction. This was a conclusion that the ExA supported.

Having considered at the updated impact piling report in the Report to Inform HRA, the Secretary of State agrees with the Applicant and the ExA that there is likely a significant effect on the waterbird assemblage qualifying feature at Humber Estuary Ramsar site. The matter has been carried forward to the AA.

Humber Estuary Ramsar site – Noise

Operational Phase

The Applicant stated [REP4-021] that noise levels during operation would only exceed the threshold for significant effects where no qualifying features would be present. NE agreed [REP10-010]. The ExA also concluded that upon clarification in [REP2-10 and AS-023] no qualifying features would be significantly impacted.

The Secretary of State agrees; the updated information does not rely on the parameters set out in the ROC modelling report and can therefore take comfort that the Project will not have any LSE from noise during operation.

Humber Estuary Ramsar site – Visual Disturbance

Construction, operational and decommissioning phases

The RIES [PD-014] and the Original Report to Inform HRA [REP2-109] produced by Applicant that LSE could be excluded for all qualifying bird species on the site from visual and recreational disturbance.

In response to questions from NE [RR-090] the applicant confirmed [REP4-021, REP4-021, REP4-028]] that the birds would be screened from operational activities and lighting from the high embankments along the estuary and River Trent, as well as the Indicative Lighting Strategy [APP-071]. NE [REP10-010] confirmed that it were satisfied. The ExA were also satisfied of no LSE after seeing clarification on the heights of the river embankments.

Again, the reasoning for excluding LSE does not rely on the parameters set out in the ROC modelling report and therefore the Secretary of State takes comfort that the Project will not have any LSE from visual disturbance during any phase of the project.

Humber Estuary SPA and Ramsar site – noise, vibration and visual disturbance effects on Functionally Linked Land used by bird qualifying features

Construction, operation, and decommissioning

The Original Report to Inform HRA [REP2-019] screened out an LSE from disturbance to bird features of the Humber Estuary SPA using Functionally Linked Land (FLL), except for mallard of the waterbird assemblage.

Functionally Linked Land is the undesignated area of land lying beyond the boundary of the protected site which is, nevertheless, used for some function (e.g. foraging, roosting, bathing etc.), by individuals belonging to populations of one or more species for which the site is designated. In some circumstances, the use of FLL may be essential in meeting a species' needs and, consequently, meeting a site's conservation objectives. Therefore, damage, deterioration or loss of access to this habitat could impact upon the designated population and thus the conservation objectives of the site. The FLL for the waterbird assemblage is the River Trent and its immediate banks.

It was considered by the Applicant in their ES Ecology and Nature Conservation chapter [APP-058] that the FLL would not be affected by dust and water pollution. The Applicant noted that any water quality effects would be negligible due to the distance of works from the river, and that they would only be felt further downstream in the form of localised and small-scale impacts on the reedbeds/saltmarsh habitats that line the river.

However, NE [RR-090] were concerned that the original report did not assess the effects of the noise, vibration, and visual disturbance for the FLL on the Humber Estuary Ramsar site and requested further information.

In response, the Applicant said that the number of birds associated with the FLL were few in number, and predominantly were found far from the point of disturbance [REP4-021] during surveys. In an oral submission to ISH3, the Applicant elaborated that most of the birds' usage of FLL is away from where the development would be, pointing out that while it may be within the overall red line boundary, most of the FLL is several hundred metres away from the actual development infrastructure. They also stated that 'very little' FLL would be lost [REP4-028].

However, as mentioned previously, at D5 the Applicant agreed that impact piling might be required, and after questioning from the ExA (Q2.5.1.6 in PD-012]), NE (Q2.5.1.6 in [REP6-041]), and IP Amy-Louise Ogman [REP8-028] the Applicant produced an updated document on the potential impacts of the impact piling, which was incorporated into the ROC Report to Inform HRA [REP6-015].

After the publication of the updated report, the Applicant's assessment was unchanged; LSE could be excluded for all birds in the waterbird assemblage, except for mallard. NE agreed with this conclusion in the final SoCG [REP10-010].

At ISH4, the ExA questioned the Applicant, asking for more information on the relationship between defined operational land under Article 43 of the dDCO [REP6-004], and the location of FLL. The ExA's main concern was the potential for noise from operational activities carried out under permitted development rights, to occur on FLL, which has not been considered in the Applicant's assessments.

In response, the Applicant updated the dDCO to remove Works Nos. 12 and 12A from the definition of operational land [REP10-004] in Article 44. These cover the area of FLL located to the west of the proposed new access road. The ExA were satisfied by this amendment to the DCO. The Secretary of State agrees that the works should be removed and is satisfied with this section of the DCO.

Overall, the ExA agrees with the Applicant and NE that the noise from the construction of the Project would have a LSE on the FLL used by mallard (part of the waterbird assemblage), but LSEs to other qualifying features can be excluded. The ExA confirmed that the updated noise level assessments, bird survey results, and the existing embankments gave them comfort in excluding LSEs [ER 6.2.60]. The updated reports did not rely on the ROC parameters, and therefore the Secretary of State agrees with the ExA's conclusion.

Humber Estuary SAC and Ramsar site - changes to air quality (dust)

Construction and decommissioning

The Humber Estuary SAC and Ramsar were screened in by the Applicant, for *"areas of upper saltmarsh of reedbed along the River Trent"* [AS-023], which the ExA took to mean the qualifying features of each site (described in Table 2). NE agreed that this was what was likely meant by the applicant, and that the Applicant had correctly screened in the correct features for dust impacts. [REP8-036]. The Applicant had screened in the dust saying that in absence of mitigation, given the proximity of the of

River Trent section of the protected sites to where construction dust impacts might occur, LSE could not be excluded [REP9-011].

The ExA agreed with the Applicant's assessment, and concluded a LSE from construction dust. The Secretary of State agrees with this conclusion.

Humber Estuary SAC, SPA and Ramsar site – Traffic Emissions

Construction and Operational phase

In the Applicant's original report [REP2-019], construction traffic emissions were screened out for a LSE, and operational traffic emissions were not assessed at all. NE was unsure if this followed its guidance set out in NEA001[28] [RR-090]. In response to NE, the Applicant confirmed that there would be no vehicle movements within 200m of a protected site, with plans to move an existing access road to the Flixborough Industrial Estate (that is currently within 100m of the protected sites) 200m to the west of any protected site. Its location can be seen in [REP3-008]. NE's current advice is that roads ≥ 200m from a protected site do not present a credible risk of LSE.

NE agreed that this was a suitable strategy, and that LSE could be screened out, but requested an updated HRA confirming no vehicle movements within 200m of the site (Q2.5.1.4 and Q2.5.1.4 in [REP6-041]).

The Applicant included the update in their ROC Report to Inform HRA [AS-023].

The Secretary of State is confident that the move of the road to 200m or greater from the boundary of any protected site is secured through R15 of the DCO, thereby avoiding an effect pathway and LSE from traffic emissions can be excluded.

Humber Estuary SAC and Ramsar site – noise and vibration impacts to river and sea lamprey from bored and impact piling

Construction and decommissioning

Originally, the Applicant did not assess noise and vibration impacts on migrating river and sea lamprey from construction activities [REP2-019]. NE disagreed with this approach and asserted that bored piling in the River Trent could have an impact on the migrating lamprey (Q5.1.9 in [REP2-100]). They noted that while they have not undertaken research on the impacts of noise and vibration on lamprey, there is research that suggests that noise and vibrations (like those seen from piling) can impact fish development, physiology and behaviour[29]

including migratory patterns[30].

---

[28] https://publications.naturalengland.org.uk/publication/4720542048845824

[29] Kunc H P., McLaughlin K E. and Schmidt R. (2016) Aquatic noise pollution: implications for individuals,

populations, and ecosystems Proc. R. Soc. B.2832016083920160839.

[30] Spiga, I., Cheesman, S., Hawkins, A., Perez-Dominguez, R., Roberts, L., Hughes, D., Elliott, M., Nedwell, J., Bentley, M. (2012). Understanding the Scale and Impacts of Anthropogenic Noise upon Fish and Invertebrates in the Marine Environment. SoundWaves Consortium Technical Review (ME5205).

In response, the Applicant (Q5.1.5 of [REP2-033]) confirmed that there would be no piling in the River Trent and hence they did not include it in their assessment. NE disagreed with this approach, maintaining an assessment on the effects of piling on lamprey should be carried out [REP4-021].

As previously mentioned, at D5 the Applicant acknowledged that there was potential for impact piling to be carried out for short durations [REP5-001, REP5-021]. In response, NE again called for an assessment into the effects of piling on lamprey species, now with the addition of impact piling, as well as bored piling (Q2.5.1.6 in [REP6-041]).

The Applicant produced an assessment [AS-016] that confirmed that bored piling would not have any impacts on the lamprey. NE was satisfied by the updated assessment [REP8-036], but further questioning by the ExA (Q2.1.4 in [PD-014]) still showed concerns about impact piling.

NE maintained that while mitigation methods (e.g. soft starting) could have the ability to avoid adverse effects, they should not be taken into account in the first stage of the HRA. The Secretary of State agrees with this approach and therefore impacts on lamprey from noise and vibration have been taken forward into the AA.

Humber Estuary SAC and Ramsar site – noise and vibration impacts to river and sea lamprey from vessel movements

Operation

As with the impacts of piling during construction and decommissioning, the impacts of noise and vibration effects on lamprey from vessel movements were not included in the Original Report to Inform HRA [APP-043]. The ExA requested that they be considered by the Applicant in their screening (Q5.1.5 of [PD-007]).

The Applicant asserted that while there would be an increase in vessel movements during the operational phase, increasing to approximately 580 movements a year (almost a 200% increase compared to the 305 movements in 2019), the lamprey would already be accustomed to vessel movements. Additionally, the Applicant assured that the total number of vessel movements would not exceed recent baseline levels, and that there was a trend of declining vessel movements in the area.

The Applicant updated their assessments for the ROC Report to Inform HRA [AS-023] to include this information, concluding no LSE, and both NE (Q2.1.5 in [REP8-036]) and the ExA were satisfied that this rationale was acceptable.

The Secretary of State is confident that the amount of vessel movement is restricted by (Requirement 5 of the DCO) and can therefore agree with NE and the ExA that noise and vibration due to vessel movements in the Humber Estuary SAC and Ramsar site can be screened out for lamprey.

Humber Estuary SPA and Ramsar site – loss of Functionally Linked Land

Construction

The Applicant [REP2-019] did not assess the potential for loss of FLL from construction in the Humber Estuary SPA and Ramsar site. NE believed that there was the possibility for LSE [RR-090] and sought further information.

This resulted in the Applicant responding with information from surveys [REP4-021]. In this, the Applicant explained that:

- pink-footed geese were not recorded using the project site or immediate surroundings and no FLL was identified for the species;
- only one redshank was recorded within the area of the Order Limits where loss of land will occur and small numbers were recorded around Lysaght's Drain, which is an area that would not be developed; and
- most mallard records were in habitat outside the Order Limits and will not be lost, or in areas within it that will remain undeveloped.

Upon receiving this information, the ExA (Q2.1.8 in [PD-014]) sought further clarification of the quantum of FLL that would be lost. The Applicant [REP8-021] stated that FLL comprises areas that are regularly used by more than 1% of the qualifying population of the SPA and as such was focused on the River Trent corridor, where there would be no direct/ permanent losses of FLL. NE agreed with the Applicants approach [REP10-10] in their final SoCG.

When this information is taken into consideration alongside the bird surveys from the area around the River Trent, the results of which are reported and assessed in the Environmental Statement, the ExA concluded that no FLL would be lost, and excluded a LSE. The Secretary of State agrees with NE and the ExA, and is satisfied that there is no LSE in the Humber Estuary SPA and Ramsar site for the loss of FLL.

Likely Significant Effects in-combination

Under the Habitats Regulations, the Secretary of State must consider whether other plans or projects in-combination with the Project might affect protected sites.

The Applicant addressed potential in-combination effects (ICEs) arising from the Project in Section 4.6 of the Original Report to Inform HRA [REP2-019] and Chapter 18 of the ES [APP-066], which set out the methodology applied for screening in-combination effects. Details of the other plans and projects included in the in-combination assessment are provided in section 6 of [APP-066].

When assessing the implications of a plan or project in light of the Conservation Objectives for protected sites, it is necessary to consider the potential for ICEs (i.e., the effects of the project combined with potential effects of other planned projects), as well as effects due to the project in isolation.

PINS Advice Note 10[4] (check citation) provides guidance on what should be considered within in-combination assessments and, states that other plans or projects should include:

- projects that are under construction;
- permitted application(s) not yet implemented;
- submitted application(s) not yet determined;
- all refusals subject to appeal procedures not yet determined;
- projects on the PINs programme of projects; and
- projects identified in the relevant development plan (and emerging development plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited and a degree of uncertainty may be present.

To inform the AA process, a number of surrounding plans and projects have been consulted by the Applicant to determine LSEs that could arise from the Project in combination with these other plans and projects. The criteria for the projects scoped in was set out in section 4.6.1 of the Original Report to Inform HRA [REP2-019].

In terms of air emissions, only developments which have significant combustion engines were looked at for ICE's.

The search area for these projects was set out using NE's criteria, an updated in NE's consultation response to the applicants PEIR, and shown in Table 1 of [REP2-019]. NE's recommendation for a screening distance was for a search radius of 15km around the main emission stack, and then a further 15 km radius around the protected sites that fell within the initial 15 km radius.

Three recently approved power generation projects (Eggborough, West Burton and Drax Repower) were identified within 15 km of protected sites that are located within 15km of the Project's ERF stack. The Applicant screened these projects out of the in-combination assessment on the basis that they would be 'displacing the emissions of a previous similar-sized emitter.', as each would be replacing coal fired generation plants, and therefore their emissions would have already been reflected in the baseline emissions used by the Applicant in their assessments.

For construction and operational disturbance, the Applicant set out a 2km search area around the Order Limits. A further 2km buffer was included in addition to the original 2km for the sections that fell within Humber Estuary SAC / Ramsar.

After consideration, the Applicant concluded that 4 sites fitted the criteria set out by NE:

- Keadby 2 (within 15 km);
- Keadby 3 (within 15 km);
- An ERF at Doncaster (within 15 km of protected sites that are within 15 km of the Project); and

- An Energy Centre in Hull (within 15 km of protected sites that are within 15 km of the Project).

Upon further consideration, the ERF in Doncaster and the Energy Centre in Hull were removed due to assessments showing that no effects were assessed more than 10km for each, and as both are more than 10 km from any protected sites that are within 15 km of the Projects emission stack, no air quality ICEs would be predicted.

The above left only Keadby 2 and Keadby 3 for consideration of ICE's. Keadby 2 began operating in March 2023, and Keadby 3 was consented in December 2022.

NE (in [RR-090], [REP2-100], [REP6-041] and [REP10-010]) did not dispute this conclusion.

NLC (Q1.0.29 in [REP2-042]) did not identify any additional projects that they believe should have been included but suggested that the Applicant might want to check the Humber Nature Partnership in-combination database. The Applicant [REP3-021] responded that the database is not publicly available.

Humber Estuary SPA and Ramsar site – noise, vibration, and visual disturbance effects

Fifteen developments were identified within 2 km of the Project which could have disturbed or displaced qualifying bird species. These plans and projects were mainly associated with the existing industrial estate and nearby residential areas. The Applicant screened out in-combination effects from disturbance or displacement of bird qualifying features for the sites, based on the fact that all of the plans and projects (bar one) are located more than 1km from the River Trent and Humber Estuary Ramsar site, and none are likely to affect FLL due to their location.

The one project that is less than 1 kilometre from the site is a proposed flood defence scheme that could cause disturbance during construction. However, the Project is located more than 4km south of the part of the River Trent that would be disturbed by the Project, and is also almost 1km from the boundary of the Humber Estuary Ramsar site. NE did not disagree with the Applicant's position [RR-090, REP4-21].

The ExA agreed with NE and the Applicant, and an in-combination LSE for noise, vibration and visual disturbance effects was screened out. The Secretary of State agrees, and the matter was not taken forward to AA.

Humber Estuary SAC, SPA and Ramsar site, Thorne Moor SAC and Thorne and Hatfield Moors SPA – emissions to air

Operation

The Applicant's Original Report to Inform HRA [APP-043] summarised predicted effects of air pollutants from the Project in combination with Keadby 2 and 3.

The original modelling concluded that when considering the combined PC of the projects, there was potential for exceedances of the 1% critical level for NH_3 and nitrogen deposition at the Humber Estuary SAC, SPA and Ramsar site, Thorne Moor

SAC, and Thorne and Hatfield Moors SPA. Similarly, for acid deposition, the combined PC of the projects could exceed the 1% critical load at Thorne Moor SAC.

In response to the original modelling, NE [RR-090] shared concerns for a potential AEoI on the protected sites from NH_3 and nitrogen deposition when the emissions are combined with those from Keadby 2 and 3.

Subsequently, the Applicant produced the updated modelling ROC Report to Inform HRA, [AS-023], which reduces the operational hours of Keadby 2 to 4,000 hours per annum. This figure is consistent with Keadby 2's EP that was issued by the EA in November 2020.

As described in section 3.2.1 of this HRA, the Secretary of State has decided against the use of the updated modelling provided in the ROC Report to Inform HRA [AS-023], due to its use of unsecured parameters. However, in the circumstance of in-combination effects, the Secretary of State has taken the decision (in agreement with NE, the Applicant and the ExA) to use the updated figures from the ROC to reduce the effects from Keadby 2. The Secretary of State has taken this decision as the updated ROC Report to Inform HRA [AS-023] uses real figures from Keadby 2's EP, which the Secretary of State is confident have been secured.

When using the updated report, the Applicant still could not exclude an LSE for in-combination effects from operational emissions to air for the Humber Estuary SAC and Ramsar site (this conclusion was the same in both the original modelling, and the ROC modelling.

NE (Q2.5.12 in [REP8-028]) agree with this conclusion, but IP Amy-Louise Ogman [REP8-028] queried how the Applicant concluded no LSEs to Thorne Moor SAC and Thorne and Hatfield Moors SPA when LSEs could not be excluded in the original modelling [APP-043].

In addition to the Humber Estuary SAC and Ramsar site that the Applicant, the ExA also conclude LSE cannot be excluded for the Humber Estuary SPA, Thorne Moor SAC and Thorne and Hatfield Moors SPA as the PC for each pollutant exceeds 1% of critical load when considered in-combination with Keadby 2 and 3. On a precautionary basis, the ExA took the matter forward to their AA. The Secretary of State agrees with the ExA's conclusion and believes the use of the ROC's figures from Keadby 2's EP is reasonable. The matter has been taken forward to the AA.

Likely Significant Effects Assessment Outcomes

The Secretary of State agrees with the recommendations of the ExA in accordance with the Applicant's assessment and concludes that LSEs cannot be excluded at the following five sites when the Project is considered alone and in-combination:

- Humber Estuary SAC
- Humber Estuary SPA
- Humber Estuary Ramsar site
- Thorne Moor SAC

- Thorne and Hatfield Moors SPA

These sites are taken forward to the AA to consider whether the Project alone and in-combination will result in an AEoI of these sites.

Stage 2: Appropriate Assessment

The Secretary of State has undertaken an objective scientific assessment of the implications of the Project on the qualifying features of the protected sites identified in his screening assessment, using best scientific evidence available. The assessment has been made in light of the site's Conservation Objectives, which are set out in Section 1.2 and the following sections of this HRA Report.

Appropriate Assessment Methodology

The requirement to undertake an AA is triggered when the competent authority determines that a plan or project is likely to have a significant effect on a protected site either alone or in-combination with other plans or projects. Guidance[31] states that the purpose of an AA is to assess the implications of the plan or project in respect of the site's Conservation Objectives, either individually or in-combination with other plans and projects, and that the conclusions should enable the competent authority to ascertain whether the plan or project will adversely affect the integrity of the site concerned. The focus is therefore specifically on the species and / or habitats for which the protected site is designated.

In line with the requirements of Regulation 63 of the Habitats Regulations:

"*In considering whether a plan or project will adversely affect the integrity of the site, the competent authority must have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which it proposes that the consent, permission or other authorisation should be given*.".

The purpose of this AA is to determine whether AEoI of the features of the six protected sites as a result of the Project alone or in-combination with other plans or projects in can be excluded, in view of the site's Conservation Objectives and using the best scientific evidence available.

In accordance with the precautionary principle embedded in the integrity test and established through case law, the Secretary of State may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the protected site, and this must be demonstrated beyond all reasonable scientific doubt[32].

---

[31] https://www.gov.uk/guidance/appropriate-assessment#what-must-an-appropriate-assessment-contain

[32] CJEU Case C-127/02 Waddenzee 7 September 2004, Reference for a preliminary ruling from the Raad van State (Netherlands) in the proceedings: Landelijke Vereniging tot Behoud van de

If the Secretary of State cannot exclude AEoI of the affected protected sites beyond all reasonable scientific doubt, then he can only agree to a plan or project if it complies with the requirements of Regulation 64 of the Habitats Regulations. Regulation 64 provides that the Secretary of State may agree to the plan or project only if satisfied that there are no alternative solutions, and that the plan or project must be carried out for IROPI. In addition, Regulation 68 requires compensatory measures to be secured which maintain the overall coherence of the NSN.

Impact pathways

The impact pathways originally considered by the Applicant [REP2-019] to have the potential to result in LSE are:

- emissions to air (operation);
- disturbance or displacement of qualifying bird features (construction, operation and decommissioning);
- disturbance or displacement of qualifying bird features using FLL (construction, operation and decommissioning);
- recreational disturbance qualifying bird features (construction, operation and decommissioning);
- changes to water quality (construction, operation and decommissioning); and
- changes to air quality (dust) (construction and decommissioning).

Site Assessment

Humber Estuary SAC and Ramsar site - Changes to surface water quality

The Applicant's assessment of changes to surface water quality from the Project alone during construction and operation, concluded that AEoI could be excluded if mitigation measures were in place.

The Applicant's mitigation, as set out in [REP6-020], includes a multi-pronged strategy to avoid contaminated leachate or surface runoff water from entering any water course, underground strata, or adjoining land.

Some of the methods employed include oil interceptor and lining any water in flows. Bunds will be used to prevent accidental river discharges, such as hydraulic fluid from construction machinery.

Additionally, the layout of the Project has been designed in a sequential manner, using hydraulic modelling to identify the optimum positioning of buildings relative to raised land, to minimise water displacement.

Waddenzee and Nederlandse Vereniging tot Bescherming van Vogels v Staatssecretaris van Landbouw, Natuurbeheer en Visserij

Good housekeeping practice is to be used throughout construction and plans to deal with contaminated water are to be included in the final CEMP, and secured in the DCO by R4(3), alongside detailed surface water and foul water drainage plans made in accordance with the Indicative Surface Water Drainage Strategy [REP3-009, REP5-019], which are secured by R8 and R9 of the DCO. Finally, the detailed OEMP [REP8-010] lists further measures to deal with any impacts during the operation of the Project, and this is secured by R4(6), R4(7) and R4(8) of the DCO.

NE [RR-090] confirmed that it believed the mitigation strategies set out above and secured in the DCO were appropriate, and sufficient to exclude AEoI I the Humber Estuary SAC and Ramsar site. They noted that there is to be no discharge in to, or abstraction of water from the River Trent (specified in ES Chapter 9 – Water Resources and Flood Risk [REP6-020]). The ExA are also satisfied that AEoI could be excluded for the site. No other IPs made comment. The Secretary of State is also satisfied that AEoI can be excluded for changes to water quality during construction and operation, given the mitigation strategies set out above

Humber Estuary SAC and Ramsar site – Changes to air quality (dust)

Construction

The Applicant concluded that there would be no AEoI [AS-023]) from changes to air quality via dust from the Project during construction, however they have not undertaken a specific assessment of dust impacts.

Instead, the Applicant included a Dust Management Plan (DMP) in Appendix B of the CoCP [AS-028], which sets out the proposed mitigation measures and best practice guidance that will be followed by contractors during the construction phase.

In response to the DM, NE stated how while they welcomed its inclusion, they disagreed about the distance of screening included in the plan.

The DMP originally screened in a 50m buffer of the Project boundary, as well as within 50m of the route(s) used by construction vehicles on the public highway, and up to 500m from the Project entrances(s) [REP9-011]. The Applicant chose these parameters in line with IAQM guidance[33].

However, NE argued that a 200m screening buffer should be used for ecological receptors, instead of the 50m buffer.

The Applicant responded confirming that the DMP would be secured via its inclusion of the CEMP (R4(3)(a) of the DCO), which NE would be consulted on prior to the commencement of construction, and in a further response [REP4-021], the Applicant confirmed a 200m screening buffer would be used, an accordingly updated their ROC Report to Inform HRA [AS-023].

In response to ExA questioning (Q3.1.3 in [PD-014]), NE confirmed they were satisfied with the amendment that was made in response to their concerns [REP8-036] and that the mitigation measures secured are sufficient to exclude an AEoI on the Humber

[33] IAQM (2017) Land-Use Planning & Development Control: Planning For Air Quality

Estuary SAC and Ramsar site. The ExA agreed with NE's conclusions. No IP other than NE commented on the matter.

The Secretary of State agrees that the 200m screening buffer is reasonable and welcomes its inclusion in the DMP. The Secretary of State is also satisfied that the mitigation measures set out in the DMP are secured via the CEMP requirement in the DCO.

Furthermore, the Secretary of State is satisfied that the above-mentioned mitigation strategies are suitable for restricting the movement of dust, and can exclude AEoI from dust on the sites, from the Project alone and in-combination with other plans or projects.

Humber Estuary SPA and Ramsar Site - Disturbance effects from noise on birds

Construction

The Applicant's view is that there would be no AEoI from the Project alone, via noise disturbing the birds during construction. They held this view, due to them regarding their mitigation strategies laid out in X as satisfactory. The Applicant concluded that the mitigation strategies that they had in place were sufficient to stop noise levels rising above 55 dB, which is the threshold used for significance[34].

The qualifying feature assessed for AEoI from this disturbance was mallard (a part of the waterbird assemblage), which were found in high numbers along the River Trent to the west/south-west of the project. NE agree – they quantify a 'significant number' using FLL as 1% of a qualifying species in a SPA[35] , whereas 4% of the wintering population at Humber Estuary SPA were using the land. Additionally NE consider the mallard species to be susceptible to disturbance from construction noise (Q3.1.5 in [REP-036]). The Applicant disagreed, maintaining that the mallard in the estuary were typically accustomed to disturbance[36] [AS-023].

Before mitigation was considered, the Applicant assessed that at 359m from the north ERF buildings, 275m from the southern buildings, 489m from concrete breaking, and 158m from the railway construction work, that the noise would be under the 55dB threshold during construction.

The Applicants' surveys showed [AS-023] that some small numbers of mallard would be within the above distances, and therefore would be affected by the noise. Additionally, if impact piling was required, large noises could be expected (but would be carried out at least 110m from the River Trent).

---

[34] Cutts N, Hemingway K & Spencer J (2013) Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects (Version 3.2), University of Hull.

[35] Bowland Ecology 2021. Identification of Functionally Linked Land supporting SPA waterbirds in the North West of England.NERC361.

[36] Woodward, I. D., Calbrade, N. A. and Holt, C.A. (2015) Humber Estuary Bird Decline Investigation 2014. BTO Research

Report No. 668.

Consequently, the Applicant proposed some mitigation measures. These include acoustic barriers that would reduce the scale of areas that would experience noise above the 55dB threshold, reducing the noise by up to 10dB in some areas.

Additionally, works that are likely to be noisier are, where possible, to be avoided between September and April

Furthermore, an Ecological Clerk of Works (ECoW) is to be present during construction, who would monitor for any signs of disturbance, and has the power to recommend further mitigation measures such as acoustic shrouds and using a non-metallic dolly, which can reduce noises by up to approximately 10dB[37] . If deemed necessary, the ECoW can request further measures laid out in the Construction Ornithological Management Plan (COMP) including a 'soft-start' approach to pilling activities which would allow any early signs of effects to be identified prior to them becoming a concern [AS-028].

By the close of examination, NE were satisfied that there would be no AEoI from noise disturbance [REP10-010], given the mitigation proposals outlined above and in the ROC Report to Inform HRA [AS-023], in accordance with Appendices K,L and M of the CoCP [AS-028].

Upon questioning by IP Amy-Louise Ogman [REP8-023], NE confirmed that they believed that the timings of pilings did not need to be secured if the use of acoustic barriers were secured in the DCO (Q3.1.4 in [REP8-036]).

The ExA were satisfied that while neither the CoCP nor the dDCO include a specific commitment to using acoustic barriers, there is sufficiently clear wording in the Applicant's management plans [AS-028] that can be transcribed into the CEMP, that provides confidence thar the 55dB threshold will not be exceeded. The Secretary of State is satisfied that the CEMP that is to be agreed with NE prior to the commencement of construction is secured by R4(3)(k to m) of the DCO and is sufficient to exclude an AEoI for mallard.

The ExA also note that one location where piling is possible is the bunker hall within the ERF building forming part of Work No. 1 in the dDCO [REP10-004]. Although current plans within the Indicative Layout [APP-025] show that the bunker hall set back from the River Trent, the ExA also note that with the Applicant's proposed Limits of Deviation (LoD)allows the bunker hall to be placed anywhere within the defined area for Works Plans A [REP5-013]. Some of this area is less than 100m from the River Trent.

Therefore, the ExA suggest that that no matter where in the LoD the bunker hall is placed, it should be placed far enough away from the River that the vibrations will be imperceptible.

Consequently, the ExA suggested the addition of the phrase: "…*provided that a minimum separation distance of 100m is maintained between the bunker hall (within Work No. 1) and the River Trent at their closest points"* to the end of Article 5(1)(a) of

[37] Table B.1 of the BS5228-1:2009+A1:2014 (Code of practice for noise and vibration control on construction and open sites – noise) (British Standards Institute, 2014a.

the dDCO. It also considered that an update to the definition of limits of deviation in Part 1 Interpretation of the DCO is required for clarity, so that it reads *"limits of deviation" means the limits of deviation shown for each work number on the works plans subject to this being in accordance with Article 5 (Limits of Deviation) of this Order*."

In summary, the ExA are satisfied that if the appropriate mitigation strategies are secured, there would be no AEoI. After considering the mitigation strategies including acoustic barriers and agreeing to the ExA's suggested amendments to the DCO, the Secretary of State agrees with the Applicant and the ExA and is satisfied that there will be no AEoI of the Humber Estuary SPA and Ramsar site from noise impacts on bird qualifying features during construction.

Humber Estuary SAC and Ramsar site - Disturbance effects on lamprey from noise and vibration arising from impact piling

Construction

The Applicant assessed that there would be no LSE from disturbance on the qualifying lamprey species of Humber Estuary SAC and Ramsar site, however, the ExA considered that the Applicant's conclusion was dependent on using a 'soft start' protocol when piling.

The ExA deemed the 'soft start' to be mitigation, and therefore regarding the precautionary principle, decided to carry forward the effects on lamprey into the AA. The Secretary of State agrees that mitigation should not be taken into consideration during the first stage of a HRA.

Many parts of the site were previously industrial areas, currently covered by hardstanding, and consequently a situation could arise where impact piling may need to be used, which could not be foreseen in current surveys. For example, if a sheet pile met an obstacle that needed cleared, such as bedrock. This is particularly the case when constructing the fuel bunker.

The likelihood of this is deemed to be low given the depth of bedrock in this area (approximately 20-21m below ground level), compared to the excavation depth of 10m, but given concerns from NE, there is the possibility of impact piling, and therefore mitigation measures have been built into the CEMP.

Appendices K and M of the CoCP [AS-028] describe the steps the Applicant would take if impact piling was deemed necessary.

Mitigation measures to be included in the CEMP include:

- in the first instance, investigate alternatives;
- acoustic screening of the activity (e.g. acoustic shroud);
- use of a non-metallic dolly between the hammer and the driving helmet;
- soft start of the pile driver (i.e. the gradual ramping up of piling power);
- restrictions on the duration of the activity; and

- restrictions on the hours of the day and days of the week in which the activity could take place.

The CEMP will be approved by NLC, with input from EA, NE and Historic England (HE).

Both the ExA and NE [REP10-10] were satisfied that the above mitigation measures were sufficient such that an AEoI of the Humber Estuary SAC and Ramsar site due to disturbance impacts on lamprey, from the Project alone and in-combination could be excluded. The Secretary of State agrees, and is satisfied that the measures are secured in the Requirement 4 of the DCO.

Humber Estuary SAC and Ramsar site - emissions to air

Operation

The Applicant's original modelling in [REP2-019] concluded that when considering the project alone, AEoI could be excluded for the Humber Estuary SAC and Ramsar site. The Applicant's reasoning for this view was that the PC's for the pollutants of concern (NH3 and nitrogen deposition) only exceeded the 1% critical load threshold, the area the emissions were affecting were very small, and across the protected sites only a small percentage of the habitats would be expected to be affected.

In [REP2-019] the Applicant provided contour plots showing the areas where the critical threshold would be exceeded, and had the following conclusions:

- NH3: 3.7 hectares (ha) of reedbed and 0.3ha of upper saltmarsh is located within the 1% critical load contour line, equating to 0.4% and 0.03% of the total habitat areas across the protected sites; and
- Nitrogen deposition: 4.4 ha of reedbed and 1.2 ha of upper saltmarsh is located within the 1% critical load contour line, equating to 0.4% and 0.1% of the total habitat areas across the protected sites.

The Applicant furthered their case using drone survey results to compare with NE's Priority Habitat Inventory Dataset and concluded that the more resilient reedbeds were more common than NE had suggested, with there being more of a mosaic of the sensitive salt marsh alongside the reedbed, rather than a landscape dominated by saltmarsh. Mosaic habitats have been found to be more resilient[38,39].

The protected sites in the Humber Estuary are particularly vulnerable due to their unfavourable condition. Consequently, NE [RR-090] asked the applicant to provide additional reasoning as to why they believe the additional PCs from the Project would

[38] Hyman, A. Challen, et al. "Long-Term Persistence of Structured Habitats: Seagrass Meadows as Enduring Hotspots of Biodiversity and Faunal Stability." Proceedings of the Royal Society B: Biological Sciences, vol. 286, no. 1912, 2 Oct. 2019, p. 20191861.

[39] National Habitat Network Maps: User Guidance, Natural England, 2020.

not impact the sites abilities to improve their status and reach their conservation objectives. They also advised that the reedbed habitat should be considered to be part of the saltmarsh feature on the Humber Estuary SAC.

In response the Applicant confirmed their views that the reedbeds are a common, transitional community at the upper end of saltmarshes, and they are a resilient plant species that is notably more tolerant to emissions and nutrient input. They also noted that the areas of affected saltmarsh would be small. NE [REP4-021] further questioned about the impact of the nutrient PCs on the site's conservation objectives.

The Applicant responded to this line of questioning in their updated modelling [AS-023]. The results from the updated modelling led to the Applicant screening out LSEs from operational emissions alone to the Humber Estuary SAC and Ramsar site. The updated in-combination assessment concluded that AEoI could be excluded as well.

NE [REP10-010] agreed with the Applicants conclusions.

Humber Estuary SPA - emissions to air

The original modelling compiled by the Applicant showed that an AEoI for the Humber Estuary SPA could be ruled out, using the same rationale as laid out above for the Humber Estuary SAC and Ramsar site.

The Applicants updated ROC modelling screened out an LSE for the Humber Estuary SPA when the impacts were considered in combination with Keadby 2 and 3. This is because the updated modelling shows that the cumulative PCs for NH3 and nitrogen deposition are both under the 1% critical level (0.68% and 0.9% (minimum) to 0.61% (maximum) respectively).

NE [REP10-010] were satisfied by the Applicants use of the updated ROC modelling [AS-023] and shared the same conclusions as the Applicant that an AEoI could be excluded for the Humber Estuary SPA, when the Project is considered in-combination with other projects (namely Keadby 2 and 3).

Thorne Moor SAC and Thorne and Hatfield Moors SPA – emissions to air

The modelling in the Original Report to Inform HRA [REP2-019] concluded that an AEoI could be excluded for Thorne Moor SAC and Thorne and Hatfield Moors SPA when the emissions produced from the Project were considered alongside emissions from Keadby 2 and 3. The Applicant excluded the sites using the same rationale as laid out above for the Humber Estuary SAC and Ramsar site.

Using the original modelling, NE [RR-090] requested further information to demonstrate why there would not be an AEoI from the cumulative air pollution. They requested this information as they advised that the AA should not consider the existence of conservation measures, preventative measures, measures specifically adopted for a programme or autonomous' measures (i.e., measures not part of that programme), if the expected benefits of those measures are not certain at the time of that assessment. This judgement was taken based on the Dutch nitrogen ruling.

NE judged the Applicants original modelling to use predicted baseline trends and therefore needed more information to confirm that there was no AEoI.

In the Applicant's updated modelling [AS-023], the Applicant screened out in-combination LSE for Thorne Moor SAC and Thorne and Hatfield Moors SPA, as the modelling showed that the combined PCs from the Project and Keadby 2 and 3 would not exceed the 1% critical load limit. Specifically, the modelling showed the in-combination PCs for the Project with Keadby 2 were:

Thorne Moor SAC:

- 0.58% of the critical level for NH3; and
- 0.7% (minimum) to 0.45% (maximum) of the critical load for nitrogen deposition.

Thorne and Hatfield Moors SPA:

- 0.33% of the critical level for NH3; and
- 0.25% (minimum) to 0.12% (maximum) of the critical load for nitrogen deposition.

Data for Keadby 3 was not included in the analysis, with the Applicant stating in [AS-023] that the data was not currently available. However, the Applicant stated that it wasn't likely that the emissions from Keadby 3 would cause the PCs to exceed the 1% limit.

NE agreed with this assumption [REP10-010] and confirmed that they were satisfied that there would be no AEoI to Thorne Moor SAC and Thorne and Hatfield Moors SPA from operational emissions to air from the Project in-combination with Keadby 2 and 3.

Mitigation

The Applicant's plans for mitigating the effects of emissions to air from the Project include the use of BAT abatement systems [REP8-009], which can be found within the BREF published by the EU[40].

NE [RR-090] also preferred to see the predicted emissions if BAT mitigation was not used, so that it could see the effectiveness of the mitigation, and remained in conversation with the Applicant throughout examination discussing whether the BAT abatement counted as mitigation or was instead a part of the Projects design [(Q5.1.7 in [REP2-100]). NE concluded [REP4-021] that meeting the BAT emissions' limits is a legal obligation by the Applicant, and they did not require further modelling.

The ExA notes that the Applicant's commitment to use BAT abatement systems is captured in the Operational Environmental Management Plan (OEMP) [REP8-010], which is secured through R4(6) of the dDCO [REP10-004].

NE [REP2-100] confirmed that while it would welcome the strengthening of the commitments to the design parameters for the main ERF, boiler and back-up generator that are set out in Schedule 1, Part 3 Parameters Table of the dDCO [REP10-010] and secured through R4(6) of the dDCO, it did not think it was necessary

[40] https://eippcb.jrc.ec.europa.eu/reference/waste-incineration-0

for the techniques to be further secured as to be satisfied that there were no AEoI from the Project alone or in-combination from emissions to air.

Examining Authority's Conclusions 6.4.24

The ExA [ER 6.4.24] recognise that there will be more detailed information to come, and the new information will be used by the EA in the EP process. The Secretary of State also notes that the EP process also involves the creation of a separate HRA which will benefit from the extra confidence around the security of emission production limits.

The Secretary of State also has due regard for the updated National Policy Statements (NPS), specifically EN-1 which states at paragraph 4.12.2 that 'The planning and pollution control systems are separate but complementary', and at 4.12.10 that 'The Secretary of State should work on the assumption that the relevant pollution control regime and other environmental regulatory regimes … will be properly applied and enforced by the relevant regulator. The Secretary of State should act to complement but not seek to duplicate them[41].Therefore, the Secretary of State has confidence that the EP process carried out by the EA will ensure the Project abides by the BAT abatement measures, and is further comforted by the parameters included in the DCO and OEMP. The Secretary of State considers the use of BAT abatement technology is appropriate mitigation and is satisfied that the stack emissions will not exceed legal limits.

Ammonia and the Environmental Permit

The original modelling [REP2-019], used the worst-case scenario for operational hours (i.e. 24 hours a day, 365 days a year), and the worst-case scenario for NH3 emissions. The results from the modelling lead to NE not agreeing that an AEoI could be excluded for the Humber Estuary SAC, SPA and Ramsar site, nor for the Thorne Moor SAC and Thorne and Hatfield Moors SAC. NE changed their view after reviewing the updated ROC modelling in [AS-023].

The ExA, however, did not change its initial view surrounding the uncertainty of the parameters used in the ROC modelling, and noted that there is no BAT Associated Emissions Levels for NH3 that would have to be met as part of the minimum requirements for granting the EP, and instead it would be up to the Applicant to propose a suitable limit. When weighing up the suitability of this measures to mitigate the impacts of emissions, the ExA considered that they would be considered in full during the EP process, and that the Project would not be allowed to operate until the permit was granted. The EP would also require a further separate HRA, and the OEMP secured in R4(7) of the dDCO must be accordance of any conditions stipulated for the granting of the EP. For these reasons, the Secretary of State is satisfied that the EP process (and the limits secured in the OEMP) will ensure that emissions levels will be restricted to a level that will avoid AEoI on the qualifying features of the protected sites,

[41] Energy NPS EN-1, 2024. Available online: https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1

and that the Secretary of State does not need to duplicate the EP process, as set out above.

Traffic Emissions

In terms of emissions arising from transport, the ExA regarded the results shown in [REP2-019] as showing a potential LSE, when using a worst-case scenario for deliveries. NE did not agree that AEoI could be excluded from the traffic emissions, however the Applicant had excluded LSE as they had used the traffic levels used in the ROC modelling (i.e. no more than 50% of material movements to arrive by road). The Applicant has not provided a more detailed analysis of the specific pollution contributions that would arise from traffic alone. The ExA had a reasonable level of confidence that the traffic movements suggested by the Applicant would be actioned, due to their commitment to build a new access road, and that R(4) of the dDCO [REP10-004] would be require the road to be built to the standard of the relevant planning authority, prior to the plant beginning operation.

The ExA also note that the majority of transport movements during operation are anticipated to come from RDF deliveries. The amount of RDF that can be used by the Project is restricted in Schedule 1 Authorised Development, Work No.1 of the dDCO [rep10-004] to 760,000 tonnes per annum. Although the specific modal split is not secured in the DCO, the ExA and Secretary of State are satisfied that due to the limits on the amount of RDF that can be processed, there is also a limit on the amount of traffic movements. Furthermore, any traffic movements will take place over 200m from any protected sites (R14 of the dDCO) and therefore the ExA is satisfied that an AEoI due to operational transport emissions can be excluded.

Conclusions

The ExA conclude that when focussing on the land use that would be authorised by the DCO, that there would be no AEoI on the Humber Estuary SAC, SPA and Ramsar site, Thorne Moor SAC and Thorne and Hatfield Moors SPA from the effects of operational emissions to air. The Secretary of State agrees with this conclusion and agrees that the subsequent and separate decision by the EA on whether to issue an operational EP for the Project will be properly applied and must consider potential impacts on protected sites and secure any mitigation required. Whilst the EA could not comment on any detailed aspects of the Applicants modelling of operational emissions as requested by the Secretary of State because the Applicant has not made a permit application in accordance with good practice, the EA did state in its response of 19 December 2023[23] that the EP process will take all matters relating to air quality into account. The Secretary of State is satisfied that effects on protected sites from operational air emissions would not lead to an AEoI of any protected site.

Appropriate Assessment conclusions

The Applicant concluded that, on the basis of the mitigation measures as secured, an AEoI of any protected site can be excluded alone and in-combination.

At the close of the Examination, NE advised [REP10-010] that it was satisfied that all relevant protected sites and their qualifying features had been taken into consideration and that it was satisfied there would be no AEoI of any of the protected sites and

qualifying features identified by the Applicant with the appropriate mitigation measures in place.

On the basis of the information before the ExA and having regard to the mitigation measures to be secured in the dDCO, the ExA [ER 6.5.6] was of the view that the Project would not result in an AEoI of the Humber Estuary SAC, Humber Estuary SPA, Humber Estuary Ramsar site, Thorne Moor SAC and Thorne and Hatfield Moors SPA, either alone or in-combination with other plans or projects.

This includes the following recommended amendment to the final DCO:

• amended definition of limits of deviation in Part 1 Interpretation of the dDCO to read *""limits of deviation" means the limits of deviation shown for each work number on the works plans subject to this being in accordance with Article 5 (Limits of Deviation) of this Order"*; and

• insertion of the wording *"…provided that a minimum separation distance of 100m is maintained between the bunker hall (within Work No. 1) and the River Trent at their closest points*" at the end of Article 5(1)(a).

Having considered all the information available to her and the mitigation measures secured through the DCO and making the ExA's suggested amendments to the DCO, the Secretary of State concludes, in line with the recommendation of the ExA and advice of NE, that the Project will not have an AEoI of any protected site beyond all reasonable scientific doubt.

Transboundary assessment

The Secretary of State believes that it is important to consider the potential impacts on protected sites in other European Economic Area (EEA) states, known as transboundary sites[42]. Further information on transboundary impacts and processes is available in PINS Advice Note 12[43]. The ExA also considered the implications for transboundary sites, in the context of looking at the wider EIA considerations. The conclusions of the ExA's considerations and the Secretary of State's own views on this matter are presented below.

On 9 December 2020, following the Applicant's request for an EIA scoping opinion, the Planning Inspectorate undertook a transboundary screening and consultation [OD-006] on behalf of the Secretary of State pursuant to Regulation 32 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and the United Nations Environment Programme Convention on Biological Diversity 1992. A second and final screening was undertaken on 6 July 2022 following acceptance of the Application.

[42] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/408465/transboundary_guidelines.pdf

[43] https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-twelve-transboundary-impacts-and-process/

On both screening occasions, PINS were of the view that the Project is not likely to have a significant effect on a transboundary site, either alone or cumulatively. No transboundary consultations were undertaken.

The Original Report to Inform HRA [REP2-019] and ES Chapter 4 [APP-052, paragraphs 1.9.1.1 to 1.9.13] confirmed that neither the Order limits, nor its effects overlap with areas of devolved administrations or with those of transboundary sites and did not identify any LSE on transboundary sites.

No correspondence was received in relation to transboundary issues during the Examination [ER 3.7.4].

The Secretary of State has not been presented with any evidence to demonstrate that transboundary impacts would have an LSE on any protected site in other EEA states. As such, the Secretary of State is satisfied that the Project, either alone or in-combination with other plans or projects, would not have any LSEs on any transboundary protected site and further stages of a transboundary assessment are not required.

Conclusion

The Secretary of State has carefully considered all information available to him, including the recommendations of the ExA, the advice of NE as the SNCB, the views of all other IPs including Local Authorities, and the Applicant's case. The Secretary of State concludes that LSEs cannot be excluded at five protected sites, when the Project is considered alone or in-combination with other plans or projects:

- Humber Estuary SAC;
- Humber Estuary SPA;
- Humber Estuary Ramsar site;
- Thorne Moor SAC; and
- Thorne and Hatfield Moors SPA

As the competent authority under the Habitats Regulations for this Application under the Planning Act 2008, the Secretary of State has undertaken an AA in respect of the Conservation Objectives of these protected sites to determine whether the Project, either alone or in-combination with other plans or projects, will result in an AEoI.

The Secretary of State agrees with the recommendation of the ExA, in accordance with the advice of the NE, that based on the information available to him, AEoI can be excluded beyond all reasonable scientific doubt at the Humber Estuary SAC, SPA and Ramsar site, and the Thorne Moor SAC and Thorne and Hatfield Moors SPA.

No LSE on any transboundary site has been identified.

Author: Energy Infrastructure Planning Team
Department for Energy Security and Net Zero

Date: 13 March 2025