Department for Energy Security & Net Zero

Habitats Regulations Assessment for an Application Under the Planning Act 2008

Drax Bioenergy with Carbon Capture and Storage Project

Regulation 63 of the Conservation of Habitats and Species Regulations 2017

January 2024

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Contents

List of abbreviations

Term	Abbreviation
Adverse Effect on Integrity	AEoI
Air Pollution Information System	APIS
Appropriate Assessment	AA
Construction Environmental Management Plan	CEMP
Critical Level	CLe
Critical Load	CLos
Development Consent Order	DCO
Environment Agency	EA
Environmental Statement	ES
European Economic Area	EEA
Examining Authority	ExA
Functionally Linked Land	FLL
Habitat Regulations Assessment	HRA
Interested Parties	IPs
Likely Significant Effect	LSE
Nationally Significant Infrastructure Project	NSIP
Natural England	NE
North Yorkshire Council	NYC
Report on the Implications for European Sites	RIES
Special Areas of Conservation	SACs
Special Protection Areas	SPAs
Statement of Common Ground	SoCG
Statutory Nature Conservation Body	SNCB
Supplementary Advice on Conservation Objectives	SACO
The Planning Inspectorate	The PINS
The Secretary of State for Energy Security and Net Zero	The Secretary of State

1 Introduction

1.1 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 by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 ("the 2019 Regulations") in respect of the Development Consent Order ("DCO") for the Drax Bioenergy with Carbon Capture and Storage Project and its associated infrastructure (the "Project"). The Examining Authority ("ExA") defines this as the "Proposed Development". For the purposes of these Regulations, the Secretary of State is the competent authority.

The Project comprises the extension of an existing onshore biomass powered generating station (Units 1 and 2 of the Drax Power Station), including construction, operation, and maintenance of post-combustion carbon capture technology. 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 as an extension to an onshore generating station with a capacity over 50MW.

The Project was accepted by the Planning Inspectorate ("PINS") on 20 June 2022 and two Inspectors was appointed as the Examining Authority ("ExA") for the Application. The Examination of the Project application began on 17 January 2023 and concluded on 17 July 2023. The ExA submitted its report of the examination including its recommendation ("the ExA's Report") to the Secretary of State on 17 October 2023. Numbered references to the ExA's Report are presented in the format "[ER *.*.*]".

This HRA also contains a consideration of the potential effects of the Project upon protected sites in European Economic Area ("EEA") States ("transboundary sites"). This is described in more detail in Section 6.

1.2 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 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"). The Regulations also provide for the classification of sites for the protection of rare

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

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, referred to as European sites in legislation, from part of the UK's National Site Network ("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").

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, 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 document, the first stage assessment of LSEs and, where required, the second stage assessment of AA to determine whether there is an AEoI of a protected site, are collectively referred to as the Habitats Regulations Assessment (HRA).

The Secretary of State has had regard to relevant guidance on the application of the HRA including the PINS (2022) Advice Note 10[2], as well as joint guidance by DEFRA, Natural England ("NE"), the Welsh Government, and Natural Resources Wales (2021) on 'Habitats Regulations Assessment: protecting a European site'[3].

1.3 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

[2] https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-ten/

[3] https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site

of its conservation objectives. Government guidance also recommends that in carrying out the LSE screening, applicants must check if the proposal could have a significant effect on a protected site that could affect its conservation objectives.

DEFRA Guidance 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[4]. 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.

NE has issued generic conservation objectives, 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 currently being updated on a rolling basis.

Where supplementary advice is not yet available for a site, NE advises that HRAs should use the generic objectives[5] 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 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

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

[5] http://publications.naturalengland.org.uk/publication/6734992977690624?cache=1656417868.31

favourable conservation status of each of the qualifying features. This is achieved by, subject to natural change, maintaining and 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.

The conservation objectives and, where available, supplementary advice on conservation objectives 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 relevant SACOs, as published by NE and the Joint Nature Conservation Committee ("JNCC"), are referenced in Table 1 of this HRA.

1.4 The Report on the Implications for European Sites and statutory consultation

Under Regulation 63(3) of the Habitats Regulations the competent authority must, for the purposes of an AA, consult the appropriate 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, with the support of the Inspectorate's Environmental Services Team, produced a Report on the Implications for European Sites ("the RIES"). The purpose of the RIES was to compile, document, and signpost information submitted by the Applicant and IPs during the Examination (until Deadline 7 on 24 May 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 website and the ExA notified IPs that it had been published. Consultation on the RIES was undertaken between 14 June 2023 and 6 July 2023. The Applicant [REP9-025] and Biofuelwatch [REP9-030 and REP9-031] provided comments on the RIES at Deadline 9 (6 July 2023). Responses to these comments were then provided by the Applicant [REP10-018] and Biofuelwatch [REP10-026] at Deadline 10 (17 July 2023).

1.5 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 website[6]. In particular:

- the ExA's Report;
- the RIES;
- the Applicant's assessment of effects, including:
    - the Applicant's HRA Report ("HRAR"): Habitats Regulations Assessment – Volume 1 – Main Text – Rev 04 [REP9-021];
    - Habitats Regulations Assessment – Volume 2 – Figures 1 to 3 [APP-186 to APP-188];
    - Habitats Regulations Assessment – Volume 3 – Appendices 1 to 8 [APP-189, APP-190, REP6-023 (Rev 3), REP6-025 (Rev 3), APP-193, APP-194, REP8-014 (Rev 2) and REP3-009, respectively];
- the Environmental Statement ("ES") [APP-037 to APP-055];
- the Statement of Common Ground ("SoCG") with NE [REP8-019] and the Environment Agency ("EA") [REP8-018].

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

The signed SoCG between the Applicant and NE [REP8-019] was submitted at Deadline 8 (13 June 2023). The SoCG confirmed that all matters relating to HRA and otherwise were agreed between the two parties, and that there were no HRA matters outstanding between them in respect of the Project.

6 https://infrastructure.planninginspectorate.gov.uk/projects/yorkshire-and-the-humber/drax-bioenergy-with-carbon-capture-and-storage-project/?ipcsection=overview

2 Project description

The Project comprises an area of approximately 125 hectares located within North Yorkshire Council (NYC) and East Riding of Yorkshire Council (ERoY) administrative areas. The Project is surrounded by the villages of Drax, approximately 700m to the southeast of the Order Limits, Long Drax approximately 1.3km northeast, Hemingbrough approximately 1.2km north and Camblesforth approximately 1.5km southwest. The location of the Project is shown in the Location Plan [AS-104], as well as the final versions of the Land Plans [AS-105] and is described in detail in ES Chapter 2 [APP-038].

The Project comprises the extension of an existing onshore biomass powered generating station (Units 1 and 2 of the Drax Power Station), including construction, operation, and maintenance of post-combustion carbon capture technology. The Project is designed to remove approximately 95% of the carbon dioxide from the flue gas of these two units (approximately 8 megatonnes per year). Carbon dioxide captured will undergo processing and compression before being transported via a proposed new pipeline for storage under the southern North Sea. Transport and storage infrastructure will be consented through separate applications submitted by other parties.

The Project works comprise:

- **Work No.1** – Extension of an existing onshore biomass powered generating station with post-combustion carbon capture technology;
- **Work No.2** – Infrastructure to transport compressed carbon dioxide;
- **Work No.3** – Supporting works in connection with and in addition to Work Nos. 1, 2 and 5;
- **Work No.4** – Works to facilitate construction access to Work Nos. 1 to 5 and 7;
- **Work No.5** – Temporary construction laydown areas;
- **Work No.6** – Habitat provision area;
- **Work No.7** – Works to create a floodplain compensation area; and
- **Work No.8** – Works to facilitate the delivery of abnormal indivisible loads to the site.

The site is split into the following parcels:

- **Drax Power Station Site** – land occupied by the Drax Power Station;
- **East Construction Laydown Area** – land situated to east of the Drax Power Station required during construction phase of the Project for temporary works;
- **Habitat Provision Area** – land within the Order Limits and situated to the northeast of the Drax Power Station to be used to provide environmental mitigation and compensation associated with the Project.

An Off-Site Habitat Provision Area has also been identified within land outside of the Order Limits and situated to the west of the site, which will be used to provide environmental mitigation and compensation associated with the Project. This will be secured via a separate s106 Agreement.

Construction of the Project is expected to start in 2026 and would be operational by the end of 2031.

2.1 Changes to the Application during Examination

A number of changes were made to the application documents during the Examination, including amendments to the wording of the dDCO. These changes were intended to address the ExA's questions, as well as points raised by IPs. They sought to improve the clarity of the drafting and address any omissions, discrepancies and other matters which were raised during the Examination.

The Applicant also submitted several revisions to the application documents, details of which can be found in the Application Guide submitted at Deadline 10 [REP10-001]. This provides a guide to all documents submitted as part of the Application and was updated at each Deadline when new or revised documents were submitted. It provides a full record of all documentation submitted into the Examination by the Applicant.

3 Stage 1: Screening for Likely Significant Effects ("LSEs")

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

The Project site is within the zone of influence of several internationally, nationally, locally protected and statutorily designated sites, as illustrated in Figure 1.

The Applicant identified protected sites within 15km of Drax Power Station. This approach was based upon emissions from treated flue gas to air, considered to be the impact pathway with the greatest zone of influence in relation to potential effects of the Project on protected sites. The protected sites and qualifying features that were considered in the Applicant's screening exercise are presented in Section 3.4 and Table 3.2 of the HRAR [REP9-021]. The Applicant's HRAR sets out the methodology applied to determining what would constitute a 'significant effect.' The Applicant identified the following protected sites for inclusion within the assessment:

- Humber Estuary Ramsar site
- Humber Estuary SAC
- Humber Estuary SPA
- Lower Derwent Valley Ramsar site
- Lower Derwent Valley SAC
- Lower Derwent Valley SPA
- River Derwent SAC
- Skipwith Common SAC
- Thorne and Hatfield Moors SPA
- Thorne Moor SAC

The protected sites and qualifying features identified were not disputed by any IPs. NE [REP8-019], NYC [REP10-014], and the EA [REP8-018], in their respective SoCGs, considered that the correct protected sites and qualifying features had been considered in the HRAR.

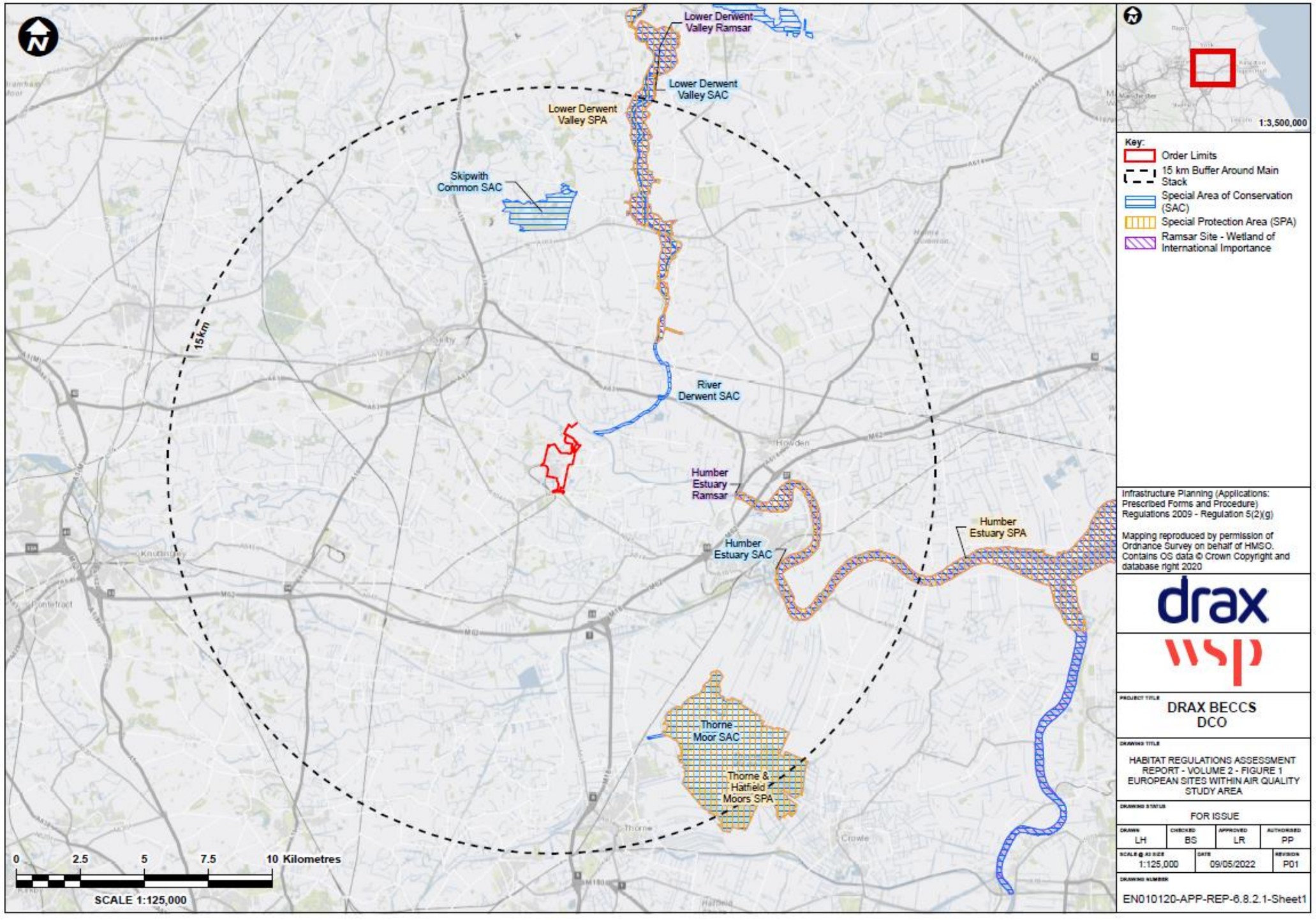

Figure 1: Spatial relationship of the Project and protected sites.

3.1 Likely Significant Effects alone

The Applicant identified the impacts, considered to have the potential to result in LSEs, from the Project alone in Section 3.5 of the HRAR.

The following impacts considered by the Applicant to have the potential to result in LSEs on protected sites during construction and decommissioning of the Project were:

- Loss and disturbance of functionally linked land ("FLL");
- Dust emissions on FLL;
- Increased risk of pollution from sediment load on FLL;
- Accidental releases of waterborne pollutants;
- Disturbance from noise and vibration;
- Increased visual disturbance of FLL; and
- Construction traffic emissions to air.

The following impacts considered by the Applicant to have the potential to result in LSEs on protected sites during operation of the Project were:

- Emissions of treated flue gas to air;
- Operational noise disturbance;
- Increased visual disturbance; and
- Accidental releases of waterborne pollutants.

The protected sites affected, and the potential impact pathways are provided in Table 3.18 of the HRAR.

3.2 Likely Significant Effects in-combination

The Applicant also identified the impacts, considered to have the potential to result in LSEs, from the Project in-combination with other developments in Section 3.5 of the HRAR.

It was determined that a number of projects identified in the HRAR had the potential to contribute in-combination effects and so were considered in the in-combination assessment carried out by the Applicant. Details of the other plans and projects included in the in-combination assessment are provided in Table 3.1 of the HRAR, consisting of:

- **ID1** - Eggborough Combined Cycle Gas Turbine power station
- **ID3** - Scotland to England Green Link 2
- **ID4** - Keadby 3 Low Carbon Gas Power Station Project
- **ID5** - Ferrybridge D Combined Cycle Gas Turbine power station
- **ID6** - Barlow Ash Mound
- **ID7** - Development of an existing horticultural facility
- **ID9** - Erection of five wind turbines and associated ancillary development

- **ID10** - Development of a ground-mounted solar farm including associated infrastructure
- **ID12** - Demolition of the Flue Gas Desulphurisation Plant at Drax Power Station
- **ID44, 52, 99, and 100** – Series of small industrial and/or commercial developments
- **ID47** - Construction of an energy recovery facility
- **ID92** - Construction of a relief road and residential development
- **ID102** - Humber Low Carbon Pipelines
- **ID103** - East Yorkshire Solar Farm
- **ID106** - Construction of a residential development

The following impacts considered by the Applicant to have the potential to result in in-combination LSEs on protected sites during construction and decommissioning of the Project were:

- Loss and disturbance of FLL;
- Dust emissions on FLL;
- Increased risk of pollution from sediment load on FLL;
- Accidental releases of waterborne pollutants;
- Disturbance from noise and vibration;
- Increased visual disturbance of FLL; and
- Construction traffic emissions to air.

The following impacts considered by the Applicant to have the potential to result in in-combination LSEs on protected sites during operation of the Project were:

- Emissions of treated flue gas to air;
- Operational noise disturbance;
- Increased visual disturbance; and
- Accidental releases of waterborne pollutants.

The protected sites affected, and the potential impact pathways are provided in Table 3.18 of the HRAR.

3.3 Likely Significant Effects outcomes

A total of ten protected sites and their qualifying features were considered in the Applicant's assessment of LSEs.

The Applicant's HRAR [REP9-021] concluded that there would be no construction, operational, or decommissioning LSEs on the qualifying features of the protected sites as a result of disturbance from noise and vibration, either alone or in-combination with other projects or plans. This conclusion was not disputed by any IPs, including NE, during the Examination [ER C.1.21].

The Applicant's HRAR [REP9-021] concluded that there would be no construction, operational, or decommissioning LSEs on the qualifying features of the protected sites as a result of construction traffic emissions, either alone or in-combination with other projects or plans.

In its Relevant Representation ("RR") [AS-011], NE considered that additional information was required on the impacts from emissions to air from construction traffic using the M62 on the Humber Estuary SAC, SPA, and Ramsar site designated features alone and in-combination. In response to NE's concerns, the Applicant considered that construction was a temporary activity and that a conservative approach had been applied to the traffic modelling [AS-038]. The forecast peak construction year Annual Average Daily Traffic was below the threshold of 200 Heavy Duty Vehicles. The Applicant also highlighted that the M62 bridge over the Humber Estuary is raised 30m above ground level, meaning pollutants emitted by vehicles would experience considerable vertical and horizontal dispersion before reaching the qualifying features of the protected sites. The Applicant also considered that the continuing decline in nitrogen oxide emissions due to the uptake of low and zero-emission vehicles meant it was reasonable to assume that the contribution of M62 traffic to nitrogen oxide levels and nitrogen deposition of the Humber Estuary will continue to reduce. In its SoCG at Deadline 1 [REP-020], NE agreed that following the submission of this additional information, no LSEs on the Humber Estuary SAC, SPA, and Ramsar site would arise from emissions from construction traffic alone or in-combination [ER C.4.53]. The ExA was satisfied with this conclusion and noted that NE agreed with the Applicant on the issue [ER C.4.54].

The Applicant's HRAR [REP9-021] also concluded that the Project would have no LSEs, either alone or in-combination with other projects or plans, on the qualifying feature (nightjar) of the Thorne and Hatfield Moors SPA. This was on the basis of the distance between the Project and the protected site, as well as the lack of suitable habitat for nightjars within or adjacent to the Order Limits.

Biofuelwatch disputed the Applicant's conclusion of no LSEs to the Thorne and Hatfield Moors SPA [REP9-030]. Biofuelwatch considered that the modelled increase in nitrogen deposition above the critical load at Thorne Moor SAC was relevant to the assessment of the Thorne and Hatfield Moors SPA and would be inconsistent with the conservation objectives of the SPA. The Applicant, at Deadline 10 [REP10-018], referred to the information obtained from the Air Pollution Information System ("APIS"), contained in Appendix 5 of the HRAR [APP-193], which confirmed that nightjars are not considered to be sensitive to air quality effects on its woodland habitats or elevated ammonia or acid deposition on its heathland habitats. The ExA was satisfied with this conclusion and noted that NE agreed with the Applicant's conclusions on the issue. The ExA considered that Biofuelwatch did not provide sufficient evidence to support its position [ER C.2.23].

As a result of additional air quality modelling and information gathered during the Examination, the Applicant identified that the acid deposition critical loads for Skipworth Common SAC would not be exceeded and subsequently concluded in the updated HRAR [REP6-021] at Deadline 6 that acid deposition would not result in LSEs on that site. This conclusion was not disputed by any IPs, including NE, during the Examination [ER C.5.4].

The final suite of protected sites for which the HRAR [REP9-021] concluded that the Project may give rise to LSEs, either alone or in-combination with other plans or projects, are listed below:

- Humber Estuary Ramsar site
- Humber Estuary SAC
- Humber Estuary SPA
- Lower Derwent Valley Ramsar site

- Lower Derwent Valley SAC
- Lower Derwent Valley SPA
- River Derwent SAC
- Thorne Moor SAC

The ExA was satisfied that the correct impact-effect pathways on each site were assessed and with the Applicant's approach to the assessment of alone and in-combination LSEs [ER C.2.24].

3.4 Likely Significant Effects conclusion

The Secretary of State has carefully 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 in the context of the Habitats Regulation. The Secretary of State considers that sufficient information has been provided to inform a robust assessment in line with her duties under the Habitats Regulations.

The protected sites and qualifying features for which LSEs were identified were not disputed by any IP, with the exception of Biofuelwatch in respect of the Thorne and Hatfield Moors SPA and its qualifying feature [ER C.5.5]. The ExA concluded that LSEs could not be excluded, either alone or in-combination with other plans or projects, for eight protected sites. This was not disputed by IPs, including NE, during the Examination [ER C.2.25].

The ExA Report and Annex 1 of the RIES provide further information regarding protected sites and qualifying features which were considered, but for which LSEs were screened out. The Secretary of State is satisfied to adopt the rationale and conclusions of the ExA for those sites and features screened out of the LSE assessment and has not duplicated this assessment here.

The Secretary of State agrees with the recommendations of the ExA, in line with the advice of NE and the conclusions of the Applicant's assessments, and concludes that LSEs cannot be excluded when the impacts of the Project are considered alone and in-combination with other plans or projects. The LSEs are taken forward to the AA to consider whether the Project will result in an AEoI of the identified protected sites. Table 1 presents the protected sites for which the Secretary of State considers that significant effects cannot be excluded, either alone or in-combination, alongside the relevant site features and impact pathways.

With regards to the ruling of the European Court of Justice (ECJ) in People Over Wind, Peter Sweetman v Coillete Teoranta (C-323/17) (the "Sweetman Judgement")[7], in reaching her conclusion regarding LSEs, the Secretary of State took no account of any measures intended to avoid or reduce effects on any protected site.

7 https://curia.europa.eu/juris/document/document.jsf?docid=200970&doclang=EN

4 Appropriate Assessment methodology

The requirement to undertake an AA is triggered when a competent authority, in this case the Secretary of State, 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 issued by DEFRA[8] 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 an AEoI on the features of the eight protected sites identified in Table 1 of this HRA, as a result of the Project alone or in-combination with other plans or projects, 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. If the Secretary of State cannot exclude AEoI of the affected protected sites beyond all reasonable scientific doubt, then she 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 imperative reasons of overriding public interest (IROPI).

8 https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site

5 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 her screening assessment, using the best scientific evidence available. The assessment has been made in light of the site's conservation objectives, which are set out in Table 1 of this HRA.

The ExA [ER 4.6.3] considered that there is sufficient information before the Secretary of State to enable her to undertake an AA. The Secretary of State agrees with the ExA in this regard.

5.1 Effect pathways

The LSEs considered by the Secretary of State to have the potential to result in an AEoI of the identified protected sites are:

Humber Estuary SAC

- Accidental releases of waterborne pollutants (alone and in-combination)

Humber Estuary SPA and Ramsar site

- Accidental releases of waterborne pollutants (alone and in-combination)
- Loss and disturbance of FLL (alone and in-combination)
- Dust emissions on FLL (alone and in-combination)
- Increased risk of pollution from sediment load on FLL (alone and in-combination)
- Increased visual disturbance of FLL (alone and in-combination)

Lower Derwent Valley SAC, SPA, and Ramsar site

- Accidental releases of waterborne pollutants (alone and in-combination)
- Loss and disturbance of FLL (alone and in-combination)
- Dust emissions on FLL (alone and in-combination)
- Increased risk of pollution from sediment load on FLL (alone and in-combination)
- Increased visual disturbance of FLL (alone and in-combination)

River Derwent SAC

- Accidental releases of waterborne pollutants (alone and in-combination)
- Loss and disturbance of FLL (alone and in-combination)
- Dust emissions on FLL (alone and in-combination)
- Increased risk of pollution from sediment load on FLL (alone and in-combination)
- Increased visual disturbance of FLL (alone and in-combination)

Thorne Moor SAC

- Treated flue gas to air emissions during operation (acid deposition) (alone)

- Treated flue gas to air emissions during operation (nitrogen and acid deposition) (in-combination)

5.2 Accidental releases of waterborne pollutants

An LSE, both alone and in-combination, was identified from potential accidental releases of waterborne pollutants on FLL related to the qualifying features of the River Derwent SAC, the Lower Derwent Valley SAC/SPA/Ramsar, and the Humber Estuary SAC/SPA/Ramsar. The in-combination LSEs would occur with ID3, ID12 (during operation only), ID102, and ID103 (during construction only).

The Applicant highlighted that the Register of Environmental Actions and Commitments ("REAC") [REP9-019] proposes a number of mitigation measures (WE8, WE9, WE12, WE14, WE15) to minimise the risk of waterborne pollution during construction of the Project. Mitigation measures would also be contained within a detailed drainage scheme that must be 'substantially in accordance' with the principles of the Surface Water Drainage Strategy [REP2-043]. Measures include the interception and collection of potentially contaminated surface water runoff and the appropriate storage and management of potential pollutants. It was also highlighted that the ecological information submitted with the planning applications of the identified in-combination developments included best practice measures within their respective Construction Environmental Management Plans ("CEMP") to minimise the risk of pollution of watercourses. The HRAR concluded that with the proposed mitigation measures in place there would be no AEoI of any protected sites, either alone or in-combination with other plans and projects, from this pathway.

Biofuelwatch raised concern in its Written Representation ("WR") [REP2-073] around the risk of amine and nitrosamine contamination of cooling water released into the River Ouse impacting the protected sites. At Deadline 3 [REP3-020], the Applicant considered that there would not be potential for water containing amines or nitrosamines to be discharged into the River Ouse, as the process water treatment plant would remove the amines and nitrosamine for containment and treatment off-site.

NE stated [AS-011] that, subject to proposed mitigation measures, it considered the Project was not likely to result in an AEoI of the protected sites in respect to accidental releases of water-borne pollutants during construction, decommissioning, and operation. This was confirmed in the final SoCG between the Applicant and NE [REP8-019]. On the basis of the proposed mitigation measures, the ExA was also satisfied that there would not be an AEoI of any protected site from the Project, either alone or in-combination with other plans and projects, relating to accidental releases of waterborne pollutants.

5.3 Loss and disturbance of FLL

An LSE was identified from potential loss or disturbance of FLL, during construction of the Off-Site Habitat Provision Area, relating to the Lower Derwent Valley SPA/Ramsar and Humber Estuary SPA/Ramsar.

The HRAR considered that much of the Off-Site Habitat Provision Area is comprised of habitats of limited value to SPA/Ramsar bird species and to which minimal change is proposed. The HRAR also noted that bird sightlines are obstructed, and the area is bisected by a public footpath used regularly for recreational activities which would remain unchanged. As requested by NE, the Applicant undertook analysis of desk studies within 1km of the Off-Site Habitat Provision Area for SPA/Ramsar bird species and concluded that the habitats within the Area were unsuitable for the relevant qualifying species.

In the final SoCG between the Applicant and NE [REP8-019], it was agreed that the Project was not likely to result in an AEoI of the protected sites in respect to potential loss or disturbance of FFL in the Off-Site Habitat Provision Area. On the basis of the unsuitability of the land for qualifying species and the continued use of the site for recreational purposes, the ExA was also satisfied that there would not be an AEoI of any protected site from the Project relating to potential loss or disturbance of FFL in the Off-Site Habitat Provision Area.

An LSE was also identified from potential loss or disturbance of FLL, arising from additional land included in Change 2 (PC-02), relating to the Humber Estuary SPA/Ramsar. The Applicant submitted a change request to the Inspectorate on 5 December 2022 [AS-044 and AS-045]. This comprised two changes. Change 2 (PC-02) required additional land to be included within the Order Limits to enable overhead line and telecommunications undergrounding work on the road network between the Drax Power Station site and Goole (Work No.8). The ExA accepted the proposed changes on 13 December 2022 [PD-009]. The Applicant considered that Work No.8 could potentially impact FLL associated with the Humber Estuary SPA/Ramsar.

NE considered [REP2-085] that further information was required in relation to the LSEs from potential loss or disturbance of FFL from the additional land included in the revised Order Limits of Change 2 (PC-02). NE recommended that the Applicant undertake further assessment of the land included within the revised Order Limits for the potential to support bird species associated with the Humber Estuary SPA/Ramsar. Biofuelwatch at Deadline 3 [REP3-024] also raised concerns about the potential loss or disturbance of FLL during construction of Work No. 8.

At Deadline 3 the Applicant responded [REP3-020] to the concerns raised by NE and Biofuelwatch. The Applicant highlighted that Work No.8 would be located within 120m of either a main road and/or a residential or commercial premise, reducing the likelihood of significant use by bird species associated with the Humber Estuary SPA/Ramsar. The Applicant also highlighted that even if the land were to be used by the relevant species, there would be no loss of FLL as the works had negligible potential for causing permanent habitat change, and that the habitats present would be reinstated following the completion of works. The Applicant considered that, under a worst-case scenario, the works would cause temporary disturbance for four weeks to a maximum of approximately 2.7ha of grassland and agricultural land. The Applicant considered that there was alternative comparable habitat abundant in the wider landscape and that the temporary disturbance of land was comparable to temporary fluctuations in land use associated with surrounding agricultural practices.

At Deadline 4 NE considered [REP4-041] that, on the basis of the further information provided by the Applicant relating to the limited spatial and temporal nature of the works and the proposed habitat reinstatement, an AEoI from potential loss or disturbance of FLL from Work No.8 could be ruled out. This was confirmed in the final SoCG between the Applicant and NE [REP8-019]. The ExA was also satisfied that there would not be an AEoI of the Humber Estuary SPA/Ramsar

from the Project relating to potential loss or disturbance of FFL from works included in Change 2 (PC-02).

An LSE was also identified for potential loss or disturbance of FLL, arising from in-combination construction LSEs with ID103 and ID106, relating to the River Derwent SAC, the Lower Derwent Valley SAC/SPA/Ramsar and Humber Estuary SPA/Ramsar. The Applicant considered that during cable installation, ID103 could result in temporary loss or disturbance of FLL potentially used by otters associated with the River Derwent SAC and Lower Valley SAC, as well as wintering birds associated with the Lower Derwent Valley SPA/Ramsar and Humber Estuary SPA/Ramsar. The Applicant concluded that there would not be an adverse effect on the basis that the permanent habitat loss from ID103 would be negligible (installation of a convertor station), temporary habitat loss would be short-term, and the habitats affected by the construction of ID103 would be reinstated. The Applicant also highlighted that the Scoping Report for ID103 confirmed that avoidance and mitigation measures would be implemented during construction.

It was considered that ID106 could result in temporary loss or disturbance of FLL adjacent to the River Ouse potentially used by otters associated with the River Derwent SAC and Lower Derwent Valley SAC. The Applicant concluded that there would not be an adverse effect on the basis that the permanent habitat loss from ID106 would be negligible, temporary habitat loss would be short-term, and the habitats affected by the construction of ID106 would be reinstated. The Applicant also highlighted that the Preliminary Ecological Appraisal for ID106 confirmed that further surveys would be carried out to determine the presence of otter near the site and the necessary avoidance and mitigation measures required.

The HRAR concluded that with the proposed mitigation measures in place there would be no AEoI of any protected sites, either alone or in-combination with other plans and projects, from this pathway.

NE stated [AS-011] that, subject to proposed mitigation measures, it considered the Project was not likely to result in an AEoI of the protected sites in respect to potential loss or disturbance of FLL during construction and decommissioning. This was confirmed in the final SoCG between the Applicant and NE [REP8-019]. The ExA was satisfied that there would not be an AEoI of any protected site from the Project, either alone or in-combination with other plans and projects, relating to potential loss or disturbance of FFL. This was on the basis of the scale of permanent habitat loss, the limited duration of temporary habitat loss, and the expectation that the proposed mitigation measures of other developments would be implemented.

5.4 Dust emissions on FLL

An LSE, both alone and in-combination, was identified from dust emissions on FLL related to otter associated with the River Derwent SAC and Lower Derwent Valley SAC; and bird species associated with the Lower Derwent Valley SPA/Ramsar and the Humber Estuary SPA/Ramsar. The in-combination LSEs would arise from ID102 and ID103.

The Applicant highlighted that the Register of Environmental Actions and Commitments [REP9-019] proposes a number of mitigation measures (G5 and AQ1) to minimise and/or suppress dust

during the construction and decommissioning of the Project. Measures include dust suppression systems, such as wheel washers and construction water sprays, as well as site-level dust monitoring. The Applicant also highlighted that best practice measures were proposed in both the PEIR for ID102 and the Scoping Report for ID103 to minimise and/or suppress dust during construction. The HRAR concluded that with the proposed mitigation measures in place there would be no AEoI of any protected sites, either alone or in-combination with other plans and projects, from this pathway.

NE stated [AS-011] that, subject to proposed mitigation measures, it considered that the Project was not likely to result in an AEoI of the protected sites in respect to dust emissions on FLL during construction and decommissioning. This was confirmed in the final SoCG between the Applicant and NE [REP8-019]. On the basis of the proposed mitigation measures, the ExA was also satisfied that there would not be an AEoI of any protected site from the Project, either alone or in-combination with other plans and projects, relating to dust emissions on FLL.

5.5 Increased risk of pollution from sediment load on FLL

An LSE, both alone and in-combination, was identified from an increased risk of pollution from sediment load on FLL related to otter associated with the River Derwent SAC and Lower Derwent Valley SAC; and bird species associated with the Lower Derwent Valley SPA/Ramsar and the Humber Estuary SPA/Ramsar. The in-combination LSE would arise from ID102.

The Applicant highlighted that the Register of Environmental Actions and Commitments [REP9-019] proposes a number of mitigation measures (WE8, WE9, WE12, WE14, WE15, G2, and G5) to minimise the risk of pollution from sediment loads during the construction and decommissioning of the Project. Measures include a Surface Water Management Plan, jute matting to mitigate release of sediment load, temporary cut-off drainage, and material washing facilities in designated areas located away from waterbodies and drainage lines. The Applicant also highlighted that best practice measures were proposed in the PEIR for ID102 to minimise the risk of pollution from sediment loads during construction. The HRAR concluded that with the proposed mitigation measures in place there would be no AEoI of any protected sites, either alone or in-combination with other plans and projects, from this pathway.

NE stated [AS-011] that, subject to proposed mitigation measures, it considered the Project was not likely to result in an AEoI of the protected sites in respect to pollution from sediment load on FLL during construction and decommissioning. This was confirmed in the final SoCG between the Applicant and NE [REP8-019]. On the basis of the proposed mitigation measures, the ExA was also satisfied that there would not be an AEoI of any protected site from the Project, either alone or in-combination with other plans and projects, relating to an increased risk of pollution from sediment load on FLL.

5.6 Increased visual disturbance of FLL

An LSE, both alone and in-combination, was identified from increased visual disturbance by plant and personnel on FLL related to otter associated with the River Derwent SAC and Lower Derwent Valley SAC and bird species associated with the Lower Derwent Valley SPA/Ramsar and the Humber Estuary SPA/Ramsar. The in-combination LSEs would arise from ID6, ID44, ID52, ID99, ID100, ID102, and ID103.

The Applicant highlighted that the Register of Environmental Actions and Commitments [REP9-019] proposes a number of mitigation measures (D4, E1, G2, G5, G7, LVIA1, LVIA2, LVIA3, LVIA5) to avoid or minimise potential visual disturbance during the construction and decommissioning of the Project. Measures include hoardings a minimum of 2.4m high around construction compound and laydown areas, detailed lighting measures to avoid and minimise potential increases in illumination, landscape mitigation planting, as well as the establishment of exclusion zones and dark corridors around identified sensitive ecological features.

In relation to in-combination LSEs, the proposed Off-Site Habitat Provision Area is approximately 50m to the west of ID6. The HRAR highlighted that an existing area of dense scrub and trees would be maintained between the Off-Site Habitat Provision Area and ID6, providing visual screening between the two sites.

ID44 is within 1km of Work No.8. The HRAR highlighted that the ecological information submitted with the planning application for ID44 stated that the habitats within the application site were considered to be of no importance to bird species associated with the Humber Estuary SPA/Ramsar. The planning application for ID44 also detailed mitigation measures, including the provision of acoustic fencing along the boundary of the site, to further reduce the risk of disturbance.

ID52 is within 1km of Work No.8. The HRAR highlighted that the ecological information submitted with the planning application for ID52 stated that the habitats within the application site were considered unsuitable for bird species associated with the Humber Estuary SPA/Ramsar. ID52 is also surrounded by several land uses, such as industrial buildings, which generate disturbance, making the location less suitable for bird species associated with the Humber Estuary SPA/Ramsar.

ID99 is within 1km of Work No.8. The HRAR highlighted that the ecological information submitted with the planning application for ID99 stated that the habitats within the application site were unsuitable for bird species associated with the Humber Estuary SPA/Ramsar.

ID100 is within 1km of Work No.8. The HRAR highlighted that the ecological information submitted with the planning application for ID100 stated that the habitats within and adjacent to the application site were unsuitable for bird species associated with the Humber Estuary SPA/Ramsar. ID100 is also surrounded by major roads and existing industrial land uses, making the location less suitable for bird species associated with the Humber Estuary SPA/Ramsar.

The western boundary of ID102 is at the northern boundary of the existing Drax Power Station site and overlaps with the Order Limits of the Project. The HRAR highlights that the habitats within and adjacent to the onshore works associated with ID102 were of low importance for bird species associated with the Humber Estuary SPA/Ramsar. The PEIR of ID102 also confirmed a

suite of measures would be implemented to avoid and mitigate disturbances, with additional measures being identified as the design and ecological surveys progressed.

The western boundary of ID103 is at the eastern boundary of the existing Drax Power Station site and overlaps with the Order Limits of the Project. It was considered that the FLL in the Habitat Provision Area, north of the Drax Power Station Site, and areas surrounding the East Construction Laydown Area may support bird species associated with the Lower Derwent Valley SPA/Ramsar and Humber Estuary SPA/Ramsar, as well as otter associated with the River Derwent SAC and Lower Derwent Valley SAC. The HRAR highlighted that the wintering bird surveys for the Project recorded no SPA species in the East Construction Laydown Area, including the eastern portion of the Habitat Provision Area. The HRAR concluded that there would be no significant visual disturbance should the construction programmes coincide. The ecological information submitted with the planning application for ID103 also confirmed a suite of measures would be implemented to avoid and mitigate disturbance.

The HRAR concluded that with the proposed mitigation measures in place there would be no AEoI of any protected sites, either alone or in-combination with other plans and projects, from this pathway.

NE stated [AS-011] that, subject to proposed mitigation measures, it considered the Project was not likely to result in an AEoI of the protected sites in respect of increased visual disturbance on FLL during construction and decommissioning. This was confirmed in the final SoCG between the Applicant and NE [REP8-019]. On the basis of the proposed mitigation measures and the unsuitability of land for qualifying species, the ExA was also satisfied that there would not be an AEoI of any protected site from the Project, either alone or in-combination with other plans and projects, relating to increased visual disturbance on FLL.

5.7 Treated flue gas to air emissions during operation

An LSE, both alone and in-combination, was identified from treated flue gas to air emissions causing acid and nitrogen deposition on the Thorne Moor SAC and Lower Derwent Vallet SAC and Ramsar site. The in-combination LSEs would arise from ID1, ID4, ID47, ID92.

The HRAR highlighted that the air quality modelling was highly precautionary and based on the following conservative assumptions:

- Meteorological data from 2016 – 2020 was used, with the results of the maximum/worst year presented;
- Units 1 and 2 of the Drax Power Station would operate at continuous full load (8,760 hours per year), which was considered unlikely to occur in reality;
- Assessment of maximum impacts anywhere in a designated site, irrespective of area represented by the maximum;
- Assessment against the lower threshold of the recommended critical levels (CLe) and critical loads (CLos); and
- ID1, ID4, and ID47 would all be operational at the same time as the Project and would operate at continuous full load (8,760 hours per year), which was considered extremely

unlikely to occur in reality and thus represents a conservative worst-case assessment of annual mean impacts

The HRAR identified two mitigation measures for flue gas emissions of acid and nitrogen deposition: reducing the concentration of sulphur dioxide emissions from the two biomass units by 40% compared to the Best Available Technique Environmental Assessment Level; and increasing the exit temperature of flue gasses from the two biomass units from 80 degrees to 100 degrees. The purpose of the two proposed measures would be to increase the buoyancy of flue gases leaving the main stack, thereby improving dispersion of pollutants; and to reduce the concentration of sulphur dioxide being emitted, thereby reducing the contribution of the Project to acid deposition at the identified protected sites. These mitigation measures would be secured through the proposed variation to the existing Drax Environmental Permit, for which an application was duly made to the Environment Agency on 18 May 2023.

The application HRAR [APP-185] concluded that, following mitigation, the modelled maximum acid deposition from the Project alone would be 1.1% of the critical load for the Lower Derwent Valley SAC/Ramsar. As the modelling was based on conservative assumptions, it was concluded that the impact would be analogous to 1% of the critical load and would not result in any perceptible changes to the condition or function of the qualifying habitat and therefore no AEoI of the protected sites. In-combination with other plans and projects, the HRAR concluded that acid deposition would be 1.9% of the critical load. As the modelling was based on conservative assumption, it was concluded that the impact would not result in any perceptible changes to condition or function of the qualifying habitat and therefore no AEoI of the protected sites.

In respect of Thorne Moor SAC, the modelled maximum impacts for NH_3 (1.1%), nitrogen deposition (1.7%), and acid deposition (1.9%) from the Project alone and in-combination with other plans and projects exceeded the critical levels and critical loads. The HRAR concluded that as these exceedances were only marginally above the critical levels and critical loads, the impact would not result in any perceptible changes to the condition or function of the qualifying features and therefore no AEoI of the protected site.

The HRAR concluded that with the proposed mitigation measures in place there would be no AEoI of any protected sites, either alone or in-combination with other plans and projects, from this pathway.

NE raised concerns in its RR [AS-011] about the following operational impacts from aerial emissions:

- Acid deposition on the Lower Derwent Valley SAC/Ramsar alone and in-combination
- Nitrogen deposition on the Thorne Moor SAC in-combination and the River Derwent SAC alone and in-combination
- NH_3 concentrations on the Thorne Moor SAC in-combination

Biofuelwatch also raised concerns in its Written Representation [REP2-073] about operational NH_3 concentrations, as well as acid and nitrogen deposition, on protected sites. At Deadline 3 [REP3-024], Biofuelwatch confirmed that it shared NE's concerns.

In response to the request by NE in its RR [AS-011] for additional assessment of the operational impacts on the River Derwent SAC from nitrogen deposition the Applicant undertook additional

analysis and survey work. Impacts of nitrogen deposition were not included in the assessment contained in the ES Air Quality chapter [APP-042]. The impacts were included in the revised dispersion modelling [REP2-065] that was subsequently undertaken, which concluded that with the proposed mitigation measures in place, the modelled maximum impacts for nitrogen deposition would be 0.3% of the critical load alone and 0.7% in-combination. Therefore, the critical load threshold would not be exceeded. NE had also requested that proxy habitats were used to enable air quality dispersion modelling against proxy habitats for the River Derwent SAC. The work undertaken to confirm the appropriate habitats for use in dispersion modelling of proxy habitats for the River Derwent SAC is included within HRAR Appendix 7 [REP2-107]. The additional assessment concluded that the features of the River Derwent SAC were not sensitive to nitrogen or acid deposition.

In response to ExQ1 [REP2-060] the Applicant stated that updated dispersion modelling had been undertaken. This accounted for updated operational emissions abatement of sulphur dioxide and an updated approach to the assessment of Keadby 2. The updated modelling concluded that the abatement mitigation enabled a greater reduction in sulphur dioxide mass emissions from the two BECCS units, leading to a corresponding reduction in the contribution of the Project to acid deposition.

The Applicant noted that full details of the updated modelling were provided in Air Quality Technical Note 2 [REP2-065]. The revised figures for pollutant deposition were lower at all the protected sites than previously predicted. Acid deposition at the Lower Derwent Valley SAC/Ramsar had reduced to 0.96% of the critical load alone and 1.56% in-combination, and to 0.6% alone and 1.49% in-combination at Thorne Moor SAC. In-combination nitrogen deposition had reduced to 1.25% of the critical load and in-combination NH_3 concentrations had reduced to 0.58% of the critical level at Thorne Moor SAC.

In response to NE's RR, the Applicant stated that it had completed site surveys of parts of the Lower Derwent Valley SAC/Ramsar, the outcomes of which were outlined in HRAR Appendix 7 [REP2-107]. It was acknowledged by the Applicant that botanical surveys were conducted outside of the optimal period but maintained that relevant species could still be identified. The surveys identified agricultural improvement within and bordering the Lower Derwent Valley, suggesting that the surveyed locations are likely to be relatively insensitive to additional aerial nitrogen and acid deposition. The Applicant maintained that the level of exceedance of pollutants was insufficient to result in an AEoI.

NE [REP2-085] also noted that the Applicant had considered amine impacts for ecological receptors only in terms of deposition but not in terms of concentration. NE, highlighting the recent review of current scientific understanding undertaken by the Environment Agency and the UK's Air Quality Technical Advisory Group, considered that there was potential for amines to react in the atmosphere in a comparable way to NH_3 and that the impacts of atmospheric breakdown products from emitted amines need to be assessed.

At Deadline 3 the Applicant considered [REP3-020] that predicted concentrations of total amines in the atmosphere would be a maximum of 0.03% of NH_3 critical levels over protected sites, and that total concentrations of nitrosamines and nitramines would be a maximum of 0.001% of NH_3 critical levels. The Applicant concluded that, on the basis of the low concentrations, the risk of adverse effects on ecological receptors was likely to be negligible.

At Deadline 4 [REP4-041], NE confirmed that the additional information provided by the Applicant had addressed all of its concerns. NE was satisfied that, subject to proposed mitigation measures, the Project was not likely to result in an AEoI of the protected sites in respect of treated flue gas to air emissions.

In its reasoning related to the Lower Derwent Valley SAC/Ramsar, NE noted the revised dispersion modelling as set out in Air Quality Technical Note 2 [REP2-065], which predicted lower contributions to the critical load than previous estimates, as well as the survey work and analysis [REP2-107] undertaken by the Applicant to confirm the habitats present along the River Derwent SAC and Lower Derwent Valley SAC. NE agreed that the survey data evidenced agricultural improvement within the landscape of the Lower Derwent Valley, suggesting that the surveyed locations are likely to be relatively insensitive to additional aerial nitrogen and acid deposition. NE also noted that the Applicant provided a habitat analysis report for the Lower Derwent Valley SAC [REP3-009], which concluded that neutral and calcareous grassland were the most abundant habitat types. NE agreed that it was therefore more appropriate to apply the critical loads for calcareous grassland rather than acid grassland, allowing for a greater pH buffering capacity and lesser sensitivity to acid deposition.

In its reasoning related to the Thorne Moor SAC, NE noted the revised dispersion modelling and the additional site-specific information provided in the updated HRAR. NE agreed with the Applicant's conclusion that the level of deposition and the potential vegetative changes as a consequence fall within the bounds of natural variation and thus would lead to imperceptible effects on the Thorne Moor SAC. In respect of in-combination impacts from NH_3 on the Thorne Moor SAC, NE noted that the revised dispersion modelling [REP2-065], particularly as a result of the removal of Keadby 2 Power Plant from the in-combination assessment and the consequential decrease in the NH_3 concentration on the SAC from 1.1% to 0.6% of the critical load, considered that an LSE could be ruled out.

In its reasoning related to the River Derwent SAC, NE noted the revised dispersion modelling and the survey work and analysis undertaken by the Applicant to confirm the habitats present along the River Derwent SAC. NE considered that 'fen, marsh, and swamp' habitat was the most appropriate and the associated critical load of 15kg of nitrogen per ha per year as sufficiently precautionary. NE noted that the impact of the Project according to the revised dispersion modelling was 0.4% of the critical load alone and 0.7% in-combination. NE also noted information provided in HRAR Appendix 6 [APP-194] which highlighted that where phosphate is the primary limiting nutrient, as in the case of the River Derwent SAC, additional inputs of nitrogen have limited effect on plant productivity.

At Issue Specific Hearing 3, Biofuelwatch raised concerns that no reference had been made to uncertainties in the nitrogen deposition modelling [REP4-037]. In its response at Deadline 3 [REP4-028], the Applicant explained that the air quality modelling was inherently highly precautionary and based on a reasonable worst-case scenario.

At Deadline 4, Biofuelwatch also raised concerns relating to what level of in-combination uncertainty NE had assumed when assessing whether nitrogen and acid deposition at Thorne Moor SAC fell within the bounds of natural variation [REP5-030]. It also raised concerns as to why NE considered nitrogen and acid deposition on the Lower Derwent Valley SAC/SPA/Ramsar and Thorne Moor SAC, even if within the bounds of natural variation, to be acceptable when critical loads are exceeded.

At Deadline 6, NE responded [REP6-050] to Biofuelwatch's concerns. NE acknowledged that the use of air quality modelling to predict pollutant deposition levels was inherently subject to uncertainty. However, NE considered that the Applicant had used a highly precautionary approach and conservative assumptions to mitigate for the uncertainty. NE considered that there was no need for further uncertainty to be applied to the air quality modelling undertaken. NE was also satisfied that the proposed mitigation would substantially decrease pollutant deposition from the Project, and that acid and nitrogen deposition would not undermine the conservation objectives of the protected sites even though critical loads are already exceeded.

At Deadline 6, the Applicant also responded [REP6-032] to Biofuelwatch's concerns. The Applicant noted that the deposition experienced at protected sites varied considerably between years and the impacts of the Project would be considerably lower than the natural variation in deposition. The Applicant also highlighted that NE had agreed that the use of the 'calcareous grassland' critical load for acid deposition, rather than the 'acid grassland' critical load, was appropriate for the Lower Derwent Valley, and that therefore the critical load was not exceeded.

The Applicant also highlighted that annual sulphur dioxide emissions from Drax Power Station have fallen from approximately 35 kilotonnes in 2012 to approximately 5 kilotonnes in 2020, in line with requirements of its Environmental Permit. The Applicant noted that as sulphur dioxide has approximately 16 times the acidifying potential of nitrogen oxides, meaning reductions in sulphur dioxide emissions lead to a proportionately greater reduction in acidification potential. The Applicant also noted that the UK sets targets to reduce sulphur dioxide emissions by 59% by 2020 and by 88% by 2030 and achieved the 2020 target with 'headroom'. The Applicant acknowledged that whilst national trends could not be fully applied at a regional or local level, it considered that the information about future likely national sulphur dioxide emissions supported its conclusions of no AEoI of protected sites.

In its comments on the REIS [REP9-030 and REP9-031] Biofuelwatch reiterated its concerns that the air quality modelling undertaken by the Applicant was not sufficiently precautionary and gave insufficient consideration to uncertainties inherent to the assessment. Uncertainties it particularly highlighted were no allowance made for uncertainties arising from the modelling software; no validation reports provided for the modelling software version used; no supporting evidence from the Air Quality Technical Advisory Group that the deposition velocities used were of worst-case scenario; and uncertainties arising from the assumption that the flue gases from the BECCS and non-BECCS units would mix completely.

The Applicant responded to the concerns raised by Biofuelwatch [REP10-018], referring back to relevant information contained in previous submissions [REP2-067, REP3-009, REP7-017, REP8-029, and PDA-002]. The Applicant confirmed that the only protected site that would, following implementation of proposed mitigation measures, experience an exceedance of 1% of the critical load for nitrogen deposition was Thorne Moor SAC, in-combination with other plans and projects. The Applicant, consistent with NE advice, reiterated that an exceedance of thresholds did not automatically result in a conclusion of AEoI of a protected site or hinder a site's conservation objectives. The Applicant highlighted that NE had agreed with its conclusion of no AEoI of any protected site [REP8-019].

As a result of updates to data held by APIS in May 2023, the Applicant submitted Air Quality Technical Note 3 at Deadline 8 [REP8-030]. The Technical Note set out changes to the air quality modelling resulting from updated APIS data, including a reduction in total pollutant

concentrations and deposition on protected sites. However, following advice by NE, the Technical Note was withdrawn at Deadline 9 on the basis that NE confirmed that it was "*satisfied with the assessment and the approach taken based on the best available information at the time that the assessment was undertaken*" [REP9-024]. Consequently, the updated HRAR [REP9-021] at Deadline 9 did not reflect the changes set out in the Technical Note.

In further comments on the REIS [REP9-030], Biofuelwatch raised concerns that the assessment of potential impacts from amines and their breakdown products was not sufficiently robust. Biofuelwatch considered that the assessment was made without determining levels of amines arising from biomass combustion nor background levels or other potential sources of amines and their breakdown products that may combine with the emissions from the Project.

The Applicant responded to the concerns raised by Biofuelwatch [REP10-018], referring back to relevant information contained in previous submissions [REP8-026 and REP9-023]. The Applicant confirmed that the assessment of deposition of amines and their breakdown products was appropriately conservative.

NE determined that subject to proposed mitigation measures, it considered the Project was not likely to result in an AEoI of the protected sites in respect of treated flue gas to air emissions during operation of the Project. This was confirmed in the final SoCG between the Applicant and NE [REP8-019]. On the basis of the evidence provided by the Applicant and NE, the ExA was also satisfied that there would not be an AEoI of any protected site from the Project, either alone or in-combination with other plans and projects, relating to treated flue gas to air emissions. The ExA noted the concerns of Biofuelwatch. NE and the ExA were also satisfied that the relevant pollution controls and environmental regulatory regimes that would be contained in a varied Environmental Permit, on which the HRA was based, would adequately regulate the aerial emissions of the Project.

5.8 Appropriate Assessment conclusion

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 eight 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 has carefully considered all the information available to her, including the recommendations of the ExA, the advice of NE as the SNCB, the views of all other IPs, and the Applicant's case.

The Applicant's HRAR came to the conclusion that no AEoI from the Project on protected sites and their qualifying features, alone and in-combination with other plans and projects, would occur. This conclusion was agreed with NE [REP8-019] and the EA [REP8-018]. Biofuelwatch had outstanding concerns at the end of the Examination [REP10-026].

Based on the findings of the Examination and subject to proposed mitigation measures, the ExA was satisfied that an AEoI of all protected sites and their qualifying features can be excluded from the Project alone and in-combination with other plans or projects [ER C.5.7].

The Secretary of State agrees with the recommendations of the ExA, in line with the advice of NE and the EA, that based on the information available and subject to the mitigation measures secured through the DCO, the Project will not adversely affect the integrity of a protected site, either alone or in-combination with other plans or projects.

The Secretary of State notes that the Applicant's dDCO submitted at Deadline 6 amended R1 to increase the commencement period of the Project from five to seven years. During the Examination, the ExA considered whether this could impact the findings and conclusions in relation to the Habitats Regulations [ER C.4.17]. The ExA was satisfied, on the basis of the information provided by the Applicant and NE's responses, that the proposed extension of time in which to commence the DCO would not have any adverse implications for the Applicant's HRA [ER C.4.20]. The Secretary of State has considered the information provided and does not consider that the Applicant has advanced a significant reason to justify an increase to the commencement period, and as such she believes that the standard five-year period in which to commence a DCO is sufficient. The Secretary of State has undertaken the AA on this basis and considers that further consideration of the implications of a seven-year commencement period is not necessary.

The Secretary of State is satisfied that the Project meets the integrity test and considers that further tests set out in the Habitats Regulations are therefore not required.

6 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. The ExA also considered the implications for transboundary sites. The conclusions of the ExA's considerations and the Secretary of State's own views on this matter are presented below.

On 7 April 2021, following the Applicant's request for an EIA scoping opinion, the PINS undertook a transboundary screening and consultation 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 30 May 2023 following submission of the Application documents. The PINS considered that the Project was unlikely to have a significant effect either alone or in-combination on the environment in an EEA state.

Potential transboundary impacts were considered in the Applicant's ES [APP-044] and HRAR [REP9-021]. The Secretary of State notes that the Applicant considered non-UK protected sites in its Application and concluded that there would be no LSE from the Project alone and in-combination on any transboundary sites.

Biofuelwatch raised concerns [REP2-073, REP6-034, and REP8-034] that there was insufficient consideration of the potential impact on protected sites in other EEA states arising from pollutant dispersion and deposition. The Applicant responded to the concerns of Biofuelwatch [REP4-020, REP7-017, and REP9-032] and considered that the 15km study area around the Drax Power Station, consistent with Environment Agency and DEFRA guidance '*Air emissions risk assessment for your environmental permit*'[9], sufficiently captured the maximum likely impacts of pollutant dispersion and deposition from the Project. NE [REP8-019], NYC [REP10-014], and the EA [REP8-018], in their respective SoCGs, considered that the correct protected sites and qualifying features had been considered in the Applicant's HRAR.

The ExA was satisfied that, on the basis of the information provided by the Applicant and NE's agreement that the correct sites had been considered in the HRAR [REP2-085], that the Project would not have an LSE on protected sites in any EEA state [ER C.1.18].

The Secretary of State has not been presented with any substantive evidence to demonstrate that transboundary impacts would have an AEoI 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 an AEoI on any transboundary protected site. She does not consider that further stages of a transboundary assessment are required.

9 https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

7 Conclusion

The Secretary of State has carefully considered all information presented within the Application, during the Examination, and the representations made by all IPs, along with the ExA's Recommendation Report.

The Secretary of State concludes that LSEs cannot be excluded at eight protected sites, when the Project is considered alone or in-combination with other plans or projects. These LSEs were taken forward to an AA to consider whether the Project would result in an AEoI of these sites.

Having considered the information and analysis available to her and having made a full assessment of the potential for an AEoI of each of the protected sites for which the potential for LSE was identified, taking into account the views of the Applicant, all IPs and the recommendation of the ExA, the Secretary of State concludes that an AEoI can be excluded beyond reasonable scientific doubt, subject to the mitigation measures secured through the DCO.

As such, the Secretary of State is satisfied that there is no significant risk to any protected site and their qualifying features as a result of the Project and considers that no further stages of a HRA are required.

Table 1: Protected sites and qualifying features considered in the assessment of LSE.

Protected site	Qualifying feature(s)	SACOs	Potential for Likely Significant Effects
Humber Estuary Ramsar site	Ramsar Criterion 1 – dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons Ramsar Criterion 3 – grey seals Ramsar Criterion 5 – bird assemblages of international importance (non-breeding season) Ramsar Criterion 6 – species/populations occurring at levels of international importance: • Common shelduck (wintering) • Eurasian golden plover (wintering) • Red knot (wintering) • Dunlin (wintering) • Black-tailed godwit (wintering) • Bar-tailed godwit (wintering) • Common redshank (wintering) Ramsar Criterion 8 – river lamprey and sea lamprey	N/A	Loss and disturbance of FLL (alone and in-combination) Dust emissions on FLL (alone and in-combination) Increased risk of pollution from sediment load on FLL (alone and in-combination) Accidental releases of waterborne pollutants (alone and in-combination) Increased visual disturbance of FLL (alone and in-combination)

Humber Estuary SAC	Atlantic salt meadows Coastal lagoons Dunes with *Hippophae rhamnoides* Embryonic shifting dunes Estuaries Fixed dunes with herbaceous vegetation Grey seal Mudflats and sandflats not covered by seawater at low tide River lamprey Salicornia and other annuals colonising mud and sand Sandbanks which are slightly covered by sea water all the time Sea lamprey Shifting dunes along the shoreline with *Ammophila arenaria*	See footnote[10]	Accidental releases of waterborne pollutants (alone and in-combination)
Humber Estuary SPA	Avocet (breeding and non-breeding) Bar-tailed godwit (non-breeding)	See footnote[11]	Loss and disturbance of FLL (alone and in-combination)

[10] https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0030170&SiteName=humber%20estuary&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=8

[11] https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9006111&SiteName=humber%20estuary&SiteNameDisplay=Humber+Estuary+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=15

	Bittern (breeding and non-breeding) Black-tailed godwit (non-breeding) Dunlin (non-breeding) Eurasian golden plover (non-breeding) Hen harrier (non-breeding) Knot (non-breeding) Little tern (breeding) Marsh harrier (breeding) Redshank (non-breeding) Ruff (non-breeding) Shelduck (non-breeding) Waterbird assemblage (non-breeding)		Dust emissions on FLL (alone and in-combination) Increased risk of pollution from sediment load on FLL (alone and in-combination) Accidental releases of waterborne pollutants (alone and in-combination) Increased visual disturbance of FLL (alone and in-combination)
Lower Derwent Valley Ramsar site	Ramsar Criterion 1 – alluvial flood meadows Ramsar Criterion 2 – wetland invertebrate assemblages Ramsar Criterion 4 – passage birds Ramsar Criterion 5 – bird assemblages of international importance Ramsar Criterion 6 – species/populations occurring at levels of international importance: • Eurasian wigeon (wintering)	N/A	Loss and disturbance of FLL (alone and in-combination) Dust emissions on FLL (alone and in-combination) Increased risk of pollution from sediment load on FLL (alone and in-combination) Accidental releases of waterborne pollutants (alone and in-combination) Increased visual disturbance of FLL (alone and in-combination)

	• Eurasian teal (wintering)		
Lower Derwent Valley SAC	Lowland hay meadows Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) Otter	See footnote[12]	Loss and disturbance of FLL (alone and in-combination) Dust emissions on FLL (alone and in-combination) Increased risk of pollution from sediment load on FLL (alone and in-combination) Accidental releases of waterborne pollutants (alone and in-combination) Increased visual disturbance of FLL (alone and in-combination)
Lower Derwent Valley SPA	Berwick's swan (non-breeding) Eurasian golden plover (non-breeding) Ruff (non-breeding) Eurasian wigeon (non-breeding) Eurasian teal (non-breeding) Northern shoveler (breeding) Waterbird assemblage (non-breeding)	See footnote[13]	Loss and disturbance of FLL (alone and in-combination) Dust emissions on FLL (alone and in-combination) Increased risk of pollution from sediment load on FLL (alone and in-combination) Accidental releases of waterborne pollutants (alone and in-combination) Increased visual disturbance of FLL (alone and in-combination)

[12] https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0012844.pdf

[13] https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK9006092.pdf

River Derwent SAC	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation Sea lamprey River lamprey Bullhead Otter	See footnote[14]	Loss and disturbance of FLL (alone and in-combination) Dust emissions on FLL (alone and in-combination) Increased risk of pollution from sediment load on FLL (alone and in-combination) Accidental releases of waterborne pollutants (alone and in-combination) Increased visual disturbance of FLL (alone and in-combination)
Thorne Moor SAC	Degraded raised bogs (still capable of natural regeneration)	See footnote[15]	Treated flue gas to air emissions during operation (acid deposition) (alone) Treated flue gas to air emissions during operation (nitrogen and acid deposition) (in-combination)

[14] https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0030253.pdf

[15] https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0012915.pdf

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Date: January 2024