



Department for
Energy Security
& Net Zero

Habitats Regulations Assessment for an Application Under the Planning Act 2008

HORNSEA PROJECT FOUR OFFSHORE WINDFARM

Regulation 63 of the Conservation of Habitats and Species
Regulations 2017

Regulation 28 of the Conservation of Offshore Marine
Habitats and Species Regulations 2017

Section 125 of the Marine and Coastal Access Act 2009



July 2023

Contents

1	Introduction	1
1.1	Background	1
1.2	Habitats Regulations Assessment (HRA)	2
1.3	Site Conservation Objectives	3
1.4	The Report on the Implications for European Sites (RIES) and statutory consultation	6
1.5	Documents referred to in this HRA	7
2	Project description	9
2.1	Offshore infrastructure	9
2.2	Onshore infrastructure	10
2.3	Construction programme	11
2.4	Project location	11
2.5	Changes to the Application during Examination and post-Examination	14
3	Stage 1: Screening for Likely Significant Effects	16
3.1	Protected sites	16
3.2	Likely Significant Effects Alone	39
3.3	Likely Significant Effects In-Combination	39
4	Appropriate Assessment methodology	42
4.1	In-Combination assessment methodology	43
5	Stage 2: Appropriate Assessment	44
5.1	Impact Pathways	44
5.2	Subtidal and intertidal benthic ecology	45
5.3	Marine mammals	46
5.3.1	Southern North Sea SAC - In-combination effects	47
5.4	The Flamborough Front and Smithic Bank	49
5.4.1	The Flamborough Front	49
5.4.2	Smithic Bank	50

5.4.3	Conclusions on marine processes.....	51
5.5	Offshore and intertidal ornithology (Excluding the Flamborough and Filey Coast SPA and the Greater Wash SPA).....	54
5.6	Appropriate Assessment: protected sites for which AEoI can be excluded.....	57
5.7	Flamborough and Filey Coast SPA.....	67
5.7.1	Kittiwake: Alone.....	67
5.7.2	Kittiwake: In-Combination.....	68
5.7.3	Additional information.....	69
5.7.4	Gannet: Alone.....	70
5.7.5	Gannet: In-Combination.....	71
5.7.6	Additional information.....	71
5.7.7	Guillemot: Alone.....	73
5.7.8	Guillemot: In-Combination.....	75
5.7.9	Additional information.....	75
5.7.10	Razorbill: Alone.....	76
5.7.11	Razorbill: In-Combination.....	78
5.7.12	Additional information.....	79
5.7.13	Seabird assemblage: Alone.....	80
5.7.14	Seabird assemblage: In-Combination.....	81
5.8	Greater Wash SPA.....	82
5.8.1	Red throated diver and common scoter: Alone and In-Combination.....	83
5.8.2	Little gull: Alone and In-combination.....	83
5.8.3	Additional information.....	83
6	Transboundary assessment _____	86
7	Appropriate assessment conclusions _____	88
8	Consideration of case for Derogation _____	90
9	Assessment of alternative solutions _____	91
9.1	Project objectives.....	91
9.1.1	Identification of alternative solutions.....	92

9.2	Consideration of alternative solutions	92
9.2.1	‘Do Nothing’	92
9.2.2	Offshore wind farms not in UK EEZ.....	93
9.2.3	Alternative locations within the UK	93
9.2.4	Alternative designs	93
9.3	Conclusion	95
10	Stage 4: Imperative Reasons of Overriding Public Interest	96
10.1	The National Policy Statements (“NPSs”)	98
10.1.1	Establishing the basis provided by the 2011 NPSs	98
10.1.2	A Synthesis of the 2011 NPSs.....	99
10.2	The United Kingdom’s legal commitment to decarbonise	100
10.2.1	Climate Change Act 2008.....	100
10.2.2	Enhancements of existing UK Government Policy on climate change: Net-Zero	101
10.3	Conclusion	102
11	Proposed Compensatory Measures	104
11.1	Kittiwake.....	104
11.1.1	The Applicant’s position.....	104
11.1.2	Position of IPs.....	106
11.1.3	ExA conclusion	107
11.1.4	Additional information	107
11.1.5	The Secretary of State’s conclusion	110
11.2	Guillemot.....	110
11.2.1	The Applicant’s position.....	110
11.2.2	Position of IPs.....	113
11.2.3	ExA conclusion	113
11.2.4	Additional information	114
11.2.5	The Secretary of State’s conclusion	116
11.3	Secondary measures	117
11.3.1	The Applicant’s position.....	117

11.3.2 The Position of IPs	118
11.3.3 ExA conclusion	118
11.3.4 The Secretary of State's conclusion	118
11.4 Strategic compensation.....	118
11.4.1 Position of IPs.....	118
11.4.2 ExA conclusion	119
11.4.3 The Secretary of State's conclusion	119
11.5 HRA of compensatory measures	119
11.5.1 ExA conclusion	120
11.5.2 The Secretary of State's conclusion	120
12 HRA conclusion	121
12.1 Kittiwake compensation	121
12.2 Guillemot compensation.....	123

List of abbreviations

Term	Abbreviation
(draft) Development Consent Order	(d)DCO
Adverse Effect on Integrity	AEoI
Appropriate Assessment	AA
Area for Lease	AFL
Chart Datum	CD
Deemed Marine Licence	DML
Environment Agency	EA
Environmental Impact Assessment	EIA
European Economic Area	EEA
Examining Authority	ExA
Exclusive Economic Zone	EEZ
Export Cable Corridor	ECC

Gravity Base Structures	GBS
Habitats Regulations Assessment	HRA
High Voltage Alternating Current	HVAC
High Voltage Direct Current	HVDC
Horizontal Directional Drilling	HDD
Interested Parties	IPs
Joint Nature and Conservation Committee	JNCC
Likely Significant Effect	LSE
Marine Management Organisation	MMO
Maximum Design Scenarios	MDS
Memorandum of Understanding	MOU
National Site Network	NSN
Nationally Significant Infrastructure Project	NSIP
Natural England	NE
Nautical Mile	NM
Offshore Petroleum Regulator for Environment and Decommissioning	OPRED
Planning Inspectorate	PINS
Relevant Representation	RR
Report on the Implications for European Sites	RIES
Report to Inform Appropriate Assessment	RIAA
Report to Inform Appropriate Assessment	RIAA
Review of Consents	RoC
Special Area of Conservation	SAC
Special Protection Area	SPA
Statement of Common Ground	SoCG
Statutory Nature Conservation Body	SNCB
The Royal Society for the Protection of Birds	RSPB
Unexploded Ordnance	UXO

Wind Turbine Generators	WTGs
-------------------------	------

[This page is intentionally left blank]

1 Introduction

1.1 Background

This is a record of the Habitats Regulations Assessment (“HRA”) that the Secretary of State for the Department of Energy Security and Net Zero (“DESNZ”) has undertaken under the w2¹ (“the Habitats Regulations”) (as amended), and the Conservation of Offshore Marine Habitats and Species Regulations 2017² (“the Offshore Habitats Regulations”) (as amended) in respect of the Development Consent Order (“DCO”) and Deemed Marine Licence (“DML”) for the Hornsea Project Four offshore windfarm and its associated infrastructure. The Examining Authority (“ExA”) in its report describes this as the “Proposed Development”. It is defined as the “Project” within this HRA for consistency with the terminology of the Habitats Regulations. For the purposes of these Regulations the Secretary of State is the competent authority.

The Project will comprise the construction and operation of an offshore windfarm comprising several onshore and offshore elements, with the wind turbine array being located approximately 69 km east of Flamborough Head off the Yorkshire coast, within the UK’s Exclusive Economic Zone (“EEZ”). The Project application 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 it is for an offshore generating station with a capacity over 100MW.

The Project was accepted for Examination by the Planning Inspectorate (“PINS”) on 26 October 2021 and a five-member Panel of Inspectors was appointed as the Examining Authority (“ExA”) for the Application. The Examination of the Project application began on 22 February 2022 and completed on 22 August 2022. The ExA submitted its report of findings and conclusions of the Examination, including its recommendation (“the ExA’s Report”), to the Secretary of State on 22 November 2022. Numbered references to the ExA’s Report are presented in the format “[ER *.*.*]”.

On 16 December 2022, 09 February 2023, 03 March 2023, 20 March 2023, 05 April, 20 April 2023 and 27 April 2023 following the close of Examination, the Secretary of State invited Interested Parties (“IP’s”) to provide additional updates or information regarding certain issues including those relating to potential impacts on qualifying features of sites within the UK’s National Site Network (“NSN”).

This HRA contains assessment of the potential effects of the Project upon protected sites in other European Economic Area (“EEA”) States (“transboundary sites”), which is included under the transboundary assessment section of the report (Section 6).

¹ <https://www.legislation.gov.uk/ukxi/2017/1012/contents/made>

² <https://www.legislation.gov.uk/ukxi/2017/1013/contents/made>

1.2 Habitats Regulations Assessment (HRA)

The Habitats Regulations and the Offshore 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. Beyond territorial waters, the Offshore Habitats Regulations serve the same function for the UK’s offshore marine area. The Secretary of State notes the Project covers areas within and outside the 12 nm limit, so both sets of Regulations apply and hereafter will be referred to collectively as the Habitats Regulations.

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 policy³ 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).

Regulation 28 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 contains similar provisions:

³ NPS EN-1 para 5.3.9

Before deciding to undertake, or give any consent, permission or other authorisation for, a relevant plan or project, a competent authority must make an appropriate assessment of the implications of the plan or project for the site in view of that site's conservation objectives.

And that:

In the light of the conclusions of the assessment, and subject to regulation 29 [IROPI], the competent authority may agree to the plan or project only if it has ascertained that it will not adversely affect the integrity of the European offshore marine site or European 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 the Project will have an adverse effect on the integrity (“AEol”) of the site in view of that site’s conservation objectives. In this document, the following assessments are collectively referred to as the HRA:

- Stage 1: Assessment of LSE;
- Stage 2: AA to determine whether there is an AEol of a site;
- Stage 3: Assessment of Alternative Solutions;
- Stage 4: Imperative Reasons of Overriding Public Interest (“IROPI”); and
- Stage 5: Proposed Compensatory Measures.

The Secretary of State has had regard to guidance on the application of HRA published by the Planning Inspectorate (2017) (Advice Note 10)⁴, the European Commission (2018)⁵, recently published joint guidance by Defra, NE, the Welsh Government and Natural Resources Wales (2021) on ‘Habitats Regulations Assessment: protecting a European site’ (the “2021 joint guidance”)⁶. It is noted that the Defra (2012) guidance was withdrawn on 15 March 2021. This former guidance has subsequently been updated and replaced by the 2021 joint guidance.

1.3 Site Conservation Objectives

Where an AA is required in respect of a protected site, regulation 63(1) of the Habitats Regulations (and regulation 28(1) of the Offshore 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

⁴ The Planning Inspectorate (2017): *Advice Note Ten: Habitats Regulations Assessment Relevant to Nationally Significant Infrastructure Projects*.

⁵ European Commission (2018) Managing Natura 2000 sites: The provisions of Article 6 of the Habitats Directive 92/43/EEC

⁶ 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>

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 objectives⁷. 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 Natural England (“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 adverse effect on integrity 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, NE⁸ 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 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 and restoring:

⁷ <https://www.gov.uk/guidance/appropriate-assessment>

⁸ <http://publications.naturalengland.org.uk/publication/6734992977690624?cache=1656417868.31>

- 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.

Appendix D of the Applicant's Report to Inform Appropriate Assessment ("RIAA") [APP-171 to APP-173] summarised site-specific information for all designated sites screened in by the Applicant along with their conservation objectives and SACOs. Equivalent 'conservation targets' were provided for non-UK protected sites. The Application documents refer to NE's SACOs throughout the assessment.

NE [REP8-029] confirmed that the conservation objectives presented in the RIAA were correct, except for Northumberland Marine SPA. The RIAA stated that the conservation objectives for the Northumberland Marine SPA were:

- "To ensure for the qualifying species that the following are maintained in the long term:
 - population of the species as a viable component of the site;
 - distribution of the species within site;
 - distribution and extent of habitats supporting the species;
 - structure, function and supporting processes of habitats supporting the species; and
 - no significant disturbance of the species."

NE [REP8-029] confirmed that the conservation objectives for the Northumberland Marine SPA have been revised. These are now to:

- "Maintain or restore:
 - 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 qualifying features within the site."

The ExA [ER 13.3.4] is satisfied that the differences are minor enough to mean that the Applicant's assessment in respect of this site can be relied on to inform the Secretary of State's conclusion. Furthermore, the ExA notes that no concerns were raised in relation to the conclusions drawn in the assessment for the Northumberland Marine SPA.

NE [REP8-029] also highlighted an update to SACOs for some protected sites, as well as SACOs for sites not identified in the RIAA. The ExA did not identify LSEs for any additional protected sites not screened in by the Applicant, and therefore was content that all relevant conservation objectives have been presented.

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 3 and Section 5 of this HRA Report.

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

Under Regulation 63(3) of the Habitats Regulations and Regulation 28(4) of the Offshore 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 JNCC is the SNCB beyond 12 nm, but this duty has been discharged by NE following the 2013 Triennial Review of both organisations^{9,10}. However, JNCC retains responsibility as the statutory advisor for protected sites that are located outside the territorial sea and UK internal waters (i.e. more than 12 nautical miles offshore) and as such continues to provide advice to NE on the significance of any potential effects on interest features of such sites.

The ExA, with support from the Inspectorate’s Environmental Services Team, produced a Report on the Implications for European Sites¹¹ (“the RIES”) [PD-015]. The purpose of the RIES was to compile, document and signpost information submitted by the Applicant and IPs during the examination (up until 4th July 2022). 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 pages and the ExA notified IPs that it had been published. Consultation on the RIES was undertaken between 28 July 2022 and 18 August 2022. The Applicant [REP-011] and NE [REP8-029] provided comments on the RIES at Deadline 8.

Several Examination submissions at Deadline 6, Deadline 7 and Deadline 8 included HRA-relevant information. NE [REP8-029] noted that the RIES did not take account of this information and advised that consultation on the RIES did not adequately discharge the statutory requirement to consult NE on AAs. Given the amount of information submitted following publication of the RIES, the ExA’s recommendation [ER 13.1.10] was that the Secretary of State should undertake further consultation to fulfil the duties under Regulation 63(3) of the Habitats Regulations and Regulation 28(4) of the Offshore Habitats Regulations.

⁹<https://www.gov.uk/government/publications/triennial-review-of-the-environment-agency-ea-and-natural-england-ne>

¹⁰ <https://www.gov.uk/government/publications/triennial-review-of-the-joint-nature-conservation-committee-jncc>

¹¹ <https://infrastructure.planninginspectorate.gov.uk/projects/yorkshire-and-the-humber/hornsea-project-four-offshore-wind-farm/?ipcsection=docs>

For the avoidance of doubt, the Secretary of State considers all representations made by all IPs on HRA matters throughout the entirety of the Examination process. He does not rely solely on consultation on the RIES to inform his conclusions on matters relevant to the HRA, but he does consider that the RIES can formally support his duties to consult on AA's. In this instance, the Secretary of State notes the late-stage provision of information relating to the HRA and NE's concern during Examination regarding the Secretary of State's duty to consult. The Secretary of State considers that the further rounds of consultation which he has issued since the close of Examination, including consulting with NE as the SNCB, in addition to the extensive consultation undertaken during Examination have adequately fulfilled his duties to consult on the AA under Regulation 63(3) of the Habitats Regulations and Regulation 28(4) of the Offshore Habitats Regulations.

1.5 Documents referred to in this HRA

This HRA Report has taken account of, and should be read in conjunction with, documents produced as part of the Application and Examination, together with the responses to the Secretary of State's requests for comments and further information which are available on the PINS NSIP web page¹². In particular:

- The ExA's Report;
- The RIES [PD-015];
- The Report to Inform Appropriate Assessment ("RIAA") [APP-167 to APP-178];
- Information to support the derogation case [APP-181 to APP-201];
- Standalone HRA of the proposed compensation measures [APP-179, APP-180];
- The final Statement of Common Ground with:
 - NE (Derogation matters) [REP7-061];
 - NE (Onshore matters) [REP7-062];
 - NE (Other offshore matters) [REP7-068];
 - NE (Offshore and intertidal ecology) [REP7-071]; and
 - The Royal Society for the Protection of Birds ("RSPB") [REP8-005]; and
 - The MMO [REP8-004].
- Responses to the Secretary of State's eight consultation letters, issued on:
 - 16 December 2022¹³, "the first consultation letter";
 - 09 February 2023¹⁴, "the second consultation letter";

¹²<https://infrastructure.planninginspectorate.gov.uk/projects/yorkshire-and-the-humber/hornsea-project-four-offshore-wind-farm/>

¹³<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002228-Hornsea%20Project%20Four%20Request%20for%20information%2016%20Dec%202022.pdf>

¹⁴<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002243-Hornsea%204%20-%20Consultation%20Letter%20-%20Final.pdf>

- 03 March 2023¹⁵, “the third consultation letter”;
- 20 March 2023¹⁶, “the fourth consultation letter”;
- 05 April 2023¹⁷, “the fifth consultation letter”;
- 20 April 2023¹⁸, “the sixth consultation letter”;
- 27 April 2023¹⁹, “the seventh consultation letter”; and
- 18 May 2023²⁰, “the eighth consultation letter”.

Plus, other information submitted during the Examination and during the Secretary of State’s consideration of the Application. Several documents were revised during pre-Examination and Examination, as detailed in the Guide to the Application [REP8-010]. The Secretary of State has considered and assessed these documents, and key information from these documents is summarised in this report.

A Statement of Common Ground (“SoCG”) between the Applicant and NE on offshore and Intertidal Ornithology was first submitted at Deadline 1 [REP1-046] and updated at Deadline 3 [REP3-018] and Deadline 7 [REP7-071]. A SoCG on other offshore matters was submitted at Deadline 1 [REP1-042] and updated at Deadline 3 [REP3-015] and Deadline 7 [REP7-068]. A SoCG on derogation matters was first submitted with the DCO application and updated at Deadline 1 [REP1-035], Deadline 7 [REP7-061]. A SoCG on onshore matters was submitted at Deadline 7 [REP7-062].

Subsequent references to the SoCGs between the Applicant and NE in this HRA Report are to the final versions, unless otherwise stated. The SoCGs confirmed that not all matters relating to HRA were agreed between the two parties, and that there were HRA matters outstanding between them in respect of the Project.

¹⁵<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002244-Hornsea%204%20-%20info%20request%20letter.pdf>

¹⁶<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002248-Letter%20from%20the%20Secretary%20of%20State.pdf>

¹⁷<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002260-Hornsea%204%20-%20Early%20April%20info%20request%20letter.pdf>

¹⁸<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002271-H4%20Info%20request%20-%2020th%20April%202023.pdf>

¹⁹<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002292-H4%20-%20Info%20request%20-%2027%20April%202023.pdf>

²⁰<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002304-H4%20Info%20request%20-%20c.%2018%20May.pdf>

2 Project description

The final design for the Project may not be confirmed until after consent has been granted. Consequently, Hornsea Four has developed 'Maximum Design Scenarios' ("MDS") to provide sufficient flexibility within the project whilst ensuring that the environmental effects of the Project eventually constructed has been properly assessed. The MDSs assessed at Application, and justification for each MDS is outlined by the Applicant in its Report to Inform Appropriate Assessment Part 9: Appendix F: Maximum Design Scenario [APP-175].

The ExA notes [ER 13.10.10] that the Applicant refined the MDS for some parameters including: a reduction of sandwave clearance volumes; location of the Dogger Bank A and B cable crossing; and a restriction to a maximum of 80 gravity-base structure foundations for turbines. These were described in the Clarification Note: Justification of Offshore Maximum Design Scenarios [REP3-035]. The Applicant considered that no implications for the information supporting its assessment of AEoI were anticipated and confirmed that no further design alternatives or mitigation options were under consideration [REP2-038] and [REP5-074]. The Applicant submitted its final updated ES project description chapter at Deadline 7 [REP7-002] to reflect the amendments to the MDS.

The Secretary of State's Habitats Regulations Assessment is based upon the MDS or worst-case potential impact of the Project for each parameter in accordance with PINS Advice Note Nine²¹.

A full description of each of Works Nos. 1 to 10 that together comprise the Project is contained in Schedule 1, Part 1 of the draft DCO [APP-203] plus a description of the Associated Development.

The proposed wind farm array area is 468km², located approximately 69km from the Yorkshire coastline at its closest point. A maximum of 180 wind turbines are proposed, with the maximum rotor blade diameter of 305m.

The power from the Hornsea Four array area to the UK National Grid will be transmitted using High Voltage Alternating Current ("HVAC") or High Voltage Direct Current ("HVDC") with up to six cable circuits installed within the offshore export cable corridor ("ECC").

The offshore export cables will make landfall south of Bridlington. Electricity generated will be transported via a maximum of six circuits installed in six trenches and an onshore HVDC converter/HVAC substation to allow the power to be transferred to the National Grid via the existing Creyke Beck National Grid substation.

2.1 Offshore infrastructure

The key offshore components of Hornsea Four will include:

²¹<https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-nine-rochdale-envelope/>

- a maximum of 180 Wind Turbine Generators (“WTGs”) and associated foundations (foundation designs potentially including monopile, mono-suction bucket, suction bucket jacket, piled jacket and gravity base);
- a maximum number of 10 platforms within the array area (comprising up to six offshore transformer substations, up to three offshore HVDC converter substations (if required for the HVDC system) and one offshore accommodation platform);
- a maximum of three HVAC booster stations (if required for the HVAC system) located in the HVAC booster station search area;
- up to six offshore export cables;
- array cables and interconnector cables between the WTGs and transformer/converter substations within the array; and
- scour and cable protection, including cable crossings.

The electrical transmission system will consist of up to six offshore cables which will collect and transport the power produced at the WTGs, to the landfall site and the associated onshore cables, ultimately connecting to the UK National Grid. HVAC and HVDC transmission systems are being considered. The decision on which transmission type will be utilised will be made post-consent.

Offshore HVAC booster substations will be required to extend the distance over which HVAC electrical export infrastructure can operate, based on the large distance from the wind farm to the landfall site. In addition to the array cables which will connect the WTGs to each other, and to one of the offshore substations, interconnector cables will be used to improve the reliability of the transmission system by interconnecting offshore substations. Additionally, a cable may be used to provide the offshore accommodation platform with power. Offshore export cables will connect the offshore substation to the landfall.

2.2 Onshore infrastructure

The onshore infrastructure for the Project will include export cables and the onshore substation and electricity balancing infrastructure (EBI). Onshore export cables will connect the landfall to the Hornsea Four onshore substation which subsequently connects to the National Grid substation at Creyke Beck.

The onshore ECC would have an approximate maximum length of 39km [APP-229] and would comprise an 80m onshore temporary easement, encompassing a 60m post-installation permanent easement. There would be 35 access points from the public highway to the onshore ECC and eight temporary logistics compounds (comprising one primary and seven secondary logistics compounds). There will be a maximum number of six onshore export cables which will be installed in direct-lay trenches, or pulled through pre-installed ducting. The cables will be installed within the Hornsea Four onshore ECC, with an expected width of 80m (this includes both the 60m permanent easement and temporary working area). At the crossing of the National Rail Network at Beswick, the ECC has been extended to 120m to facilitate horizontal directional drilling (“HDD”) of the railway line.

The onshore substation area of 164,000m² will be accompanied by a temporary area of construction of 130,000m². As set out in the Planning Statement the onshore substation would

comprise a range of equipment including transformers, shunt reactors, dynamic reactive power compensation plant, harmonic filters and various switchgear. The equipment could be contained within either a single building or multiple buildings. If a single building was to be used, then the maximum parameters would be 25m in height, 240m in length and 80m in width [APP-229, paragraph 2.6.2.3]. In addition, up to two separate EBI plants could be constructed. The maximum parameters for the main EBI buildings would be 15m in height, 100m in length and 25m in width. The MDS for the secondary EBI building would be 20m in height, 40m in length and 40m in width [APP-229, paragraph 2.6.3.4].

2.3 Construction programme

Onshore works are anticipated to commence in March 2024, lasting 32 months. Piling works offshore are scheduled to start December 2024, running until November 2025, with unexploded ordnance (“UXO”) clearance and geophysical survey pre-dating that.

An indicative construction programme was provided in Figure 1 of the Planning Statement [APP-229]. This indicated the anticipated construction timescales for the various elements of the Project. The Applicant has anticipated that the maximum construction duration for the entire Project would be 61 months.

The final offshore construction programme will be submitted to the Marine Management Organisation (“MMO”) under condition 13 of the generation assets DML and condition 13 of the transmission assets DML in the draft DCO. The construction programme must include details of:

- (i) the proposed construction start date;
- (ii) proposed timings for mobilisation of plant delivery, materials, and installation works; and
- (iii) an indicative written construction programme for all WTGss, offshore accommodation platforms, and cable comprised in the works at paragraph 2 to 3(b) of Part 1 (licensed marine activities) of [Schedule 11] (insofar as not shown in paragraph (ii) above), and paragraph 2 of Part 1 (licensed marine activities) of Schedule 12 unless otherwise agreed in writing with the MMO.

The final ‘as-built’ parameters will be submitted to the MMO under condition 24 of the generation assets DML.

2.4 Project location

The Project array area is approximately 69km due east of Flamborough Head, at its closest point (Figure 1). Water depths generally vary from around 30m below Chart Datum (“CD”) in the south of the Hornsea Four array area to more than 60m below CD in the north, although the greatest depths are on the north-eastern flank which shelves into Outer Silver Pit.

Sandwaves are present within the Hornsea Four array area, particularly across the north-west corner and the southern margin. Surficial sediments across the Hornsea Four array area are typically sandy material with small amounts of gravel and muds. The main exception is along the

southern boundary where there is a slightly higher percentage of gravels and a coarser substrate described as slightly gravelly sand.

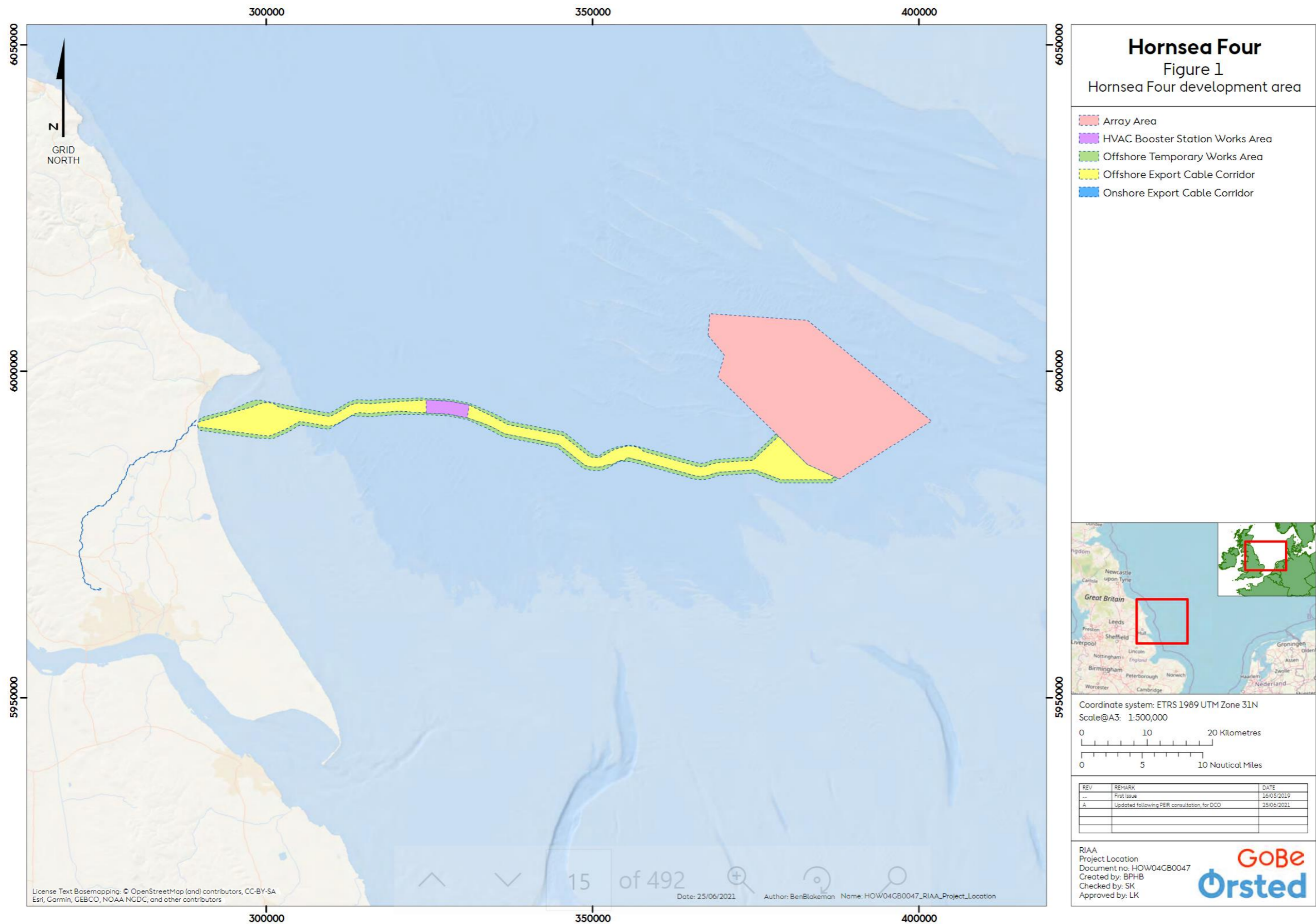


Figure 1: Location of key infrastructure of the Project.

2.5 Changes to the Application during Examination and post-Examination

No changes that fell outside of the Rochdale Envelope were made during the Examination. A Project Description Schedule of Change, dated 14 January 2022, was issued by the Applicant [AS-006]. Table 1 listed the changes that had been made in relation to s51 advice regarding the EBI by removing the previous references to hydrogen electrolysis and confirming that the proposed substation would be onshore.

Changes made during the Examination that fell within the Rochdale envelope of the Project are summarised below:

- Reduction in the maximum number of gravity-base structure (“GBS”) foundations that could be installed for WTGs from 110 to 80 in total (Schedule 11, Part 2, Condition 1(8), [REP7-039]);
- Reduction in the maximum total seabed footprint area for WTG foundations to 302,180m² excluding scour protection, and 985,240m² including scour protection (Schedule 11, Part 2, Condition 1(6)(a) and 1(6)(b), [REP7-039]);
- Reduction in the maximum total volume of scour protection material for the WTG foundations to 1,582,040 cubic metres (m³) (Schedule 11, Part 2, Condition 1(7), [REP7-039]);
- Increase in the maximum amount of cable protection in Work No. 1(c) to 624,000 m² (Schedule 11, Part 2, Condition 3(1) [REP7-039]);
- Introduction of a requirement that a bridge link forming part of the authorised project must be installed at a minimum height of 20m when measured from LAT (Schedule 11, Part 2, Condition 2(7) [REP7-039]);
- Amendment to the definition of the maximum eastern extent of the temporary construction ramp (Work No. 9(d));
- Changes to constraints on the locations of HDD exit pits in relation to Mean Low Water; and
- Minor amendments to the minimum separation distance between the Project and the Hornsea Two offshore wind farm.

The Secretary of State has decided that protected provisions for the benefit of Harbour Energy and NEO are to be included in the DCO for matters unrelated to the potential environmental impacts of the Project (see the Secretary of States Decision Letter). The Applicants response of 31 March 2023^{22,23} to the third consultation letter described the impact of each Protective Provision ‘Scenario’ on the number of turbines and area of the array lost compared to the baseline. Scenario 2 (NEO) results in the loss of 4 turbines and 5km² (1.4% of the baseline), and scenario 4 (Harbour) results in the loss of 9 turbines and 11.7km² (3.2 % of the baseline). Maps showing the areas of the array which would be lost are provided in Appendix A²². As the

²²<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002256-G11.1%20Applicant's%20Response%20Letter%20to%20RFI%20dated%2003%20March%202023.pdf>

²³<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002259-G11.4%20Totality%20of%20impact%20of%20Protective%20Provisions%20on%20Hornsea%20Project%20Four.pdf>

Protective Provisions result in a reduction in the array area and a number of WTGs, in the fifth consultation letter the Secretary of State invited the Applicant to provide updated modelling of impacts to bird features of the Flamborough and Filey Coast SPA for each scenario. The Applicant responded on 16 May 2023^{24,25,26}. The Secretary of State notes that the addition of the protective provisions for scenarios 2 and 4 would make minimal difference to the predictions of auk mortalities. As the protective provisions could fall away post-consent, the Secretary of State's HRA must also account for a worst-case scenario of the full extent of the array as applied for.

In response to the fifth consultation letter on 16 May 2023, the Applicant²⁴ committed to removing GBS as a foundation type for WTGs in the design envelope of the Project. The Applicant provided a table of proposed draft DCO amendments in Appendix A of its response which are required to give effect to the commitment. Further consideration is presented in Section 5.4.

²⁴<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002296-G13.1%20Applicant's%20Response%20Letter%20to%20RFI%20dated%2005%20April%202023.pdf>

²⁵<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002297-G13.2%20Technical%20Note%20Impact%20of%20Protective%20Provisions%20on%20Seabird%20Modelling.pdf>

²⁶<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002298-G13.3%20Appendix%20to%20Technical%20Note%20Impact%20of%20Protective%20Provisions%20on%20Seabird%20Modelling.pdf>

3 Stage 1: Screening for Likely Significant Effects

Under Regulation 63 of the Habitats Regulations and Regulation 28 of the Offshore 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.

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.

3.1 Protected sites

The Project is located within one protected site and within the zone of influence of several others.

The Applicant screened in protected sites based on the sensitivities, ecological characteristics and specific behaviours of likely receptors; and the features of the protected sites that could be affected by this type of project. The criteria are:

- 1A: Protected sites with physical overlap with the Project order limits;
- 1B: Protected sites with supporting or functionally linked habitat located within the Project order limits;
- 2: Protected sites with qualifying mobile species whose range (such as foraging, migrating, overwintering, breeding or natural habitat range) may interact with potential effects from the Project;
- 3: Protected sites with a qualifying feature located within the potential zone of effects associated with the Project; and
- 4: Birds that are features of sites that are outside of the Project order limits, and outside of the zone of any effect, but for which there is the potential for those species to pass through or visit Hornsea Four during the non-breeding season. This may be as they:
 - Migrate north or south through the North Sea (applicable to seabirds); or
 - Migrate east or west across the North Sea (applicable to intertidal waterbirds); or
 - Migrate south to winter in the North Sea (applicable to seabirds).

The RIAA [APP-168] identifies the receptor ranges and spatial extents used to identify protected sites.

Only the Southern North Sea SAC is identified under criteria 1A and 1B. Protected sites identified under criteria 2, 3 and 4 are presented in Table 1 and Figure 2, Figure 3 and Figure 4 respectively.

Table 1: Protected sites identified using criteria 2. The site ID correlates to the locations of sites in Figure 2.

Site ID	Protected Site	Relevant features	Distance from			
			Array boundary	Offshore ECC	Onshore ECC	Substation
1	Agger Tange, Nissum Bredning, Skibsted Fjord og Agerø (Denmark) SAC	• Harbour porpoise	511 km	534 km	N/A	N/A
2	Anse de Vauville (France) SAC	• Harbour porpoise • Bottlenose dolphin	512 km	494 km	N/A	N/A
3	Baie de Canche et couloir des trois estuaires (France) SAC	• Harbour porpoise	362 km	372 km	N/A	N/A
4	Baie de Seine occidentale (France) SAC	• Harbour porpoise	497 km	491 km	N/A	N/A
5	Baie de Seine orientale (France) SAC	• Harbour porpoise • Bottlenose dolphin	494 km	503 km	N/A	N/A
6	Banc et récifs de Surtainville (France) SAC	• Harbour porpoise • Bottlenose dolphin	528 km	513 km	N/A	N/A
7	Bancs des Flandres (France) SAC	• Harbour porpoise	284 km	296 km	N/A	N/A
8	Borkum-Riffgrund (Germany) SAC	• Harbour porpoise	292 km	320 km	N/A	N/A
9	Doggerbank (Germany) SAC	• Harbour porpoise	222 km	239 km	N/A	N/A
10	Doggersbank (Dutch) SAC	• Harbour porpoise • Grey seal • Harbour seal	84 km	109 km	N/A	N/A
11	Dråby Vig (Denmark) SAC	• Harbour porpoise	554 km	577 km	N/A	N/A
12	Estuaire de la Seine (France) SAC	• Harbour porpoise	485 km	495 km	N/A	N/A

Hornsea Four Offshore Wind Farm Habitats Regulations Assessment

13	Estuaires et littoral picards (baies de Somme et d'Authie) (France) SAC	<ul style="list-style-type: none"> • Bottlenose dolphin • Harbour porpoise 	383 km	394 km	N/A	N/A
14	Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant (France) SAC	<ul style="list-style-type: none"> • Harbour porpoise • Bottlenose dolphin 	326 km	337 km	N/A	N/A
15	Flamborough & Filey Coast (UK) SPA	<ul style="list-style-type: none"> • Gannet • Kittiwake • Herring gull • Guillemot • Razorbill • Fulmar • Puffin 	63.0 km	2.5 km	N/A	N/A
16	Forth Islands (UK) SPA	<ul style="list-style-type: none"> • Fulmar • Gannet 	272 km	272 km	N/A	N/A
17	Gule Rev (Denmark) SAC	<ul style="list-style-type: none"> • Harbour porpoise 	535 km	555 km	N/A	N/A
18	Hamburgisches Wattenmeer (Germany) SAC	<ul style="list-style-type: none"> • Harbour porpoise 	431 km / 436 km	459 km / 464 km	N/A	N/A
19	Helgoland mit Helgoländer Felssockel (Germany) SAC	<ul style="list-style-type: none"> • Harbour porpoise 	403 km	431 km	N/A	N/A
20	Humber Estuary (UK) SAC	<ul style="list-style-type: none"> • Sea lamprey (Petromyzon marinus) • River lamprey (Lampetra fluviatilis) • Grey seal 	74 km	47 km	N/A	N/A
21	Jyske Rev, Lillefiskerbanke (Denmark) SAC	<ul style="list-style-type: none"> • Harbour porpoise 	442 km	461 km	N/A	N/A
22	Klaverbank (Netherlands) SAC	<ul style="list-style-type: none"> • Harbour porpoise • Grey seal • Harbour seal 	78 km	106 km	N/A	N/A

Hornsea Four Offshore Wind Farm Habitats Regulations Assessment

23	Kosterfjorden-Väderöfjorden (Sweden) SAC	• Harbour porpoise	768 km	788 km	N/A	N/A
24	Løgstør Bredning, Vejlerne og Bulbjerg (Denmark) SAC	• Harbour porpoise	560 km	582 km	N/A	N/A
25	Lønstrup Rødgrund (Denmark) SAC	• Harbour porpoise	625 km	646 km	N/A	N/A
26	Moray Firth (UK) SAC	• Bottlenose dolphin	471 km	451 km	N/A	N/A
27	Nationalpark Niedersächsisches Wattenmeer (Germany) SAC	• Harbour porpoise	326 km	354 km	N/A	N/A
28	Noordzeekustzone (Netherlands) SAC	• Harbour porpoise	221 km	244 km	N/A	N/A
29	NTP S-H Wattenmeer und angrenzende Küstengebiete (Germany) SAC	• Harbour porpoise	416 km	444 km	N/A	N/A
30	Oosterschelde (Netherlands) SAC	• Harbour porpoise	285 km	302 km	N/A	N/A
31	Récifs et landes de la Hague (France) SAC	• Harbour porpoise	501 km	483 km	N/A	N/A
32	Récifs et marais arrière-littoraux du Cap Lévi à la Pointe de Saire (France) SAC	• Harbour porpoise • Bottlenose dolphin	484 km	475 km	N/A	N/A
33	Récifs Gris-Nez Blanc-Nez (France) SAC	• Harbour porpoise	316 km	326 km	N/A	N/A
34	Ridens et dunes hydrauliques du détroit du Pas-de-Calais (France) SAC	• Harbour porpoise	320 km	330 km	N/A	N/A
35	River Derwent (UK) SAC	• Sea lamprey	107 km	36 km	N/A	N/A
36	Sandbanker ud for Thorsminde (Denmark) SAC	• Harbour porpoise	480 km	503 km	N/A	N/A
37	SBZ 1 / ZPS 1 (Belguim)	• Harbour porpoise	301 km	315 km	N/A	N/A
38	SBZ 2 / ZPS 2 (Belguim)	• Harbour porpoise	291 km	306 km	N/A	N/A

Hornsea Four Offshore Wind Farm Habitats Regulations Assessment

39	SBZ 3 / ZPS 3 (Belguim)	• Harbour porpoise	295 km	311 km	N/A	N/A
40	Skagens Gren og Skagerak (Denmark) SAC	• Harbour porpoise	657 km	678 km	N/A	N/A
41	Southern North Sea (UK) SAC	• Harbour porpoise	0 km	0 km	N/A	N/A
42	SPA Östliche Deutsche Bucht (Germany) SCI	• Harbour porpoise	378 km	406 km	N/A	N/A
43	Steingrund (Germany) SAC	• Harbour porpoise	414 km	442 km	N/A	N/A
44	Store Rev (Denmark) SAC	• Harbour porpoise	622 km	643 km	N/A	N/A
45	Sydligte Nordsø (Denmark) SAC	• Harbour porpoise	373 km	399 km	N/A	N/A
46	Sylter Außenriff (Germany) SCI	• Harbour porpoise	321 km	347 km	N/A	N/A
47	The Wash and North Norfolk Coast (UK) SAC	• Harbour seal	88 km	98 km	N/A	N/A
48	Thyborøn Stenvolde (Denmark) SAC	• Harbour porpoise	479 km	501 km	N/A	N/A
49	Vadehavet med Ribe Å, Tved Å og Varde Å vest for Varde (Denmark) SAC	• Harbour porpoise	443 km	469 km	N/A	N/A
50	Venø, Venø Sund (Denmark) SAC	• Harbour porpoise	523 km	546 km	N/A	N/A
51	Vlaamse Banken (Belguim) SAC	• Harbour porpoise	266 km	279 km	N/A	N/A
52	Vlakte van de Raan (Belguim/Netherlands) SAC	• Harbour porpoise	291 km / 280 km	306 km / 296 km	N/A	N/A
53	Voordelta (Netherlands) SAC	• Harbour porpoise	265 km	282 km	N/A	N/A
54	Waddenzee (Netherlands) SAC	• Harbour porpoise	229 km	253 km	N/A	N/A
55	Westerschelde and Saeflunghe (Netherlands) SAC	• Harbour porpoise	290 km	306 km	N/A	N/A

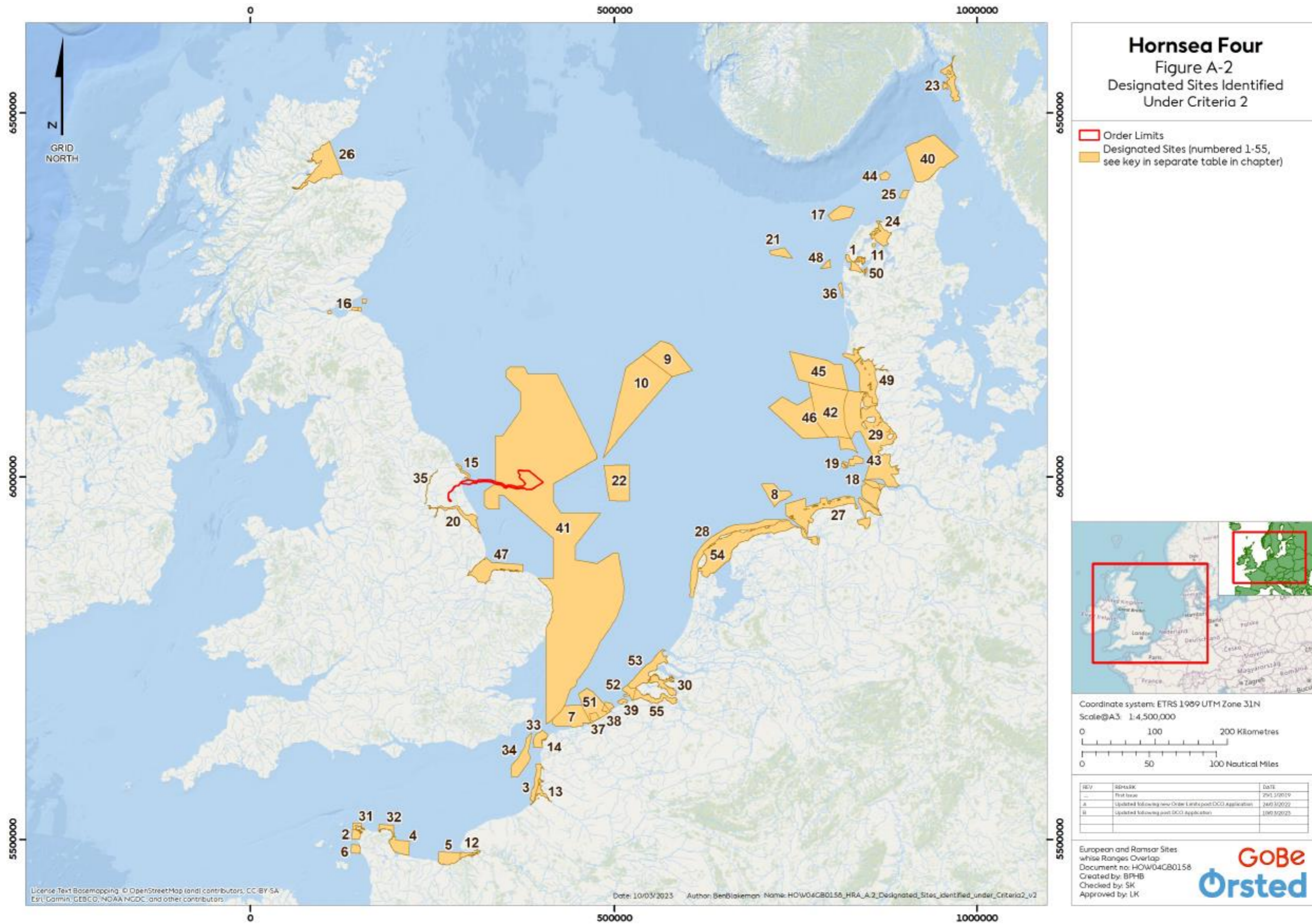


Figure 2: Protected sites identified using criteria 1a, 1b and 2. The site numbers correlate to the site ID in Table 1.

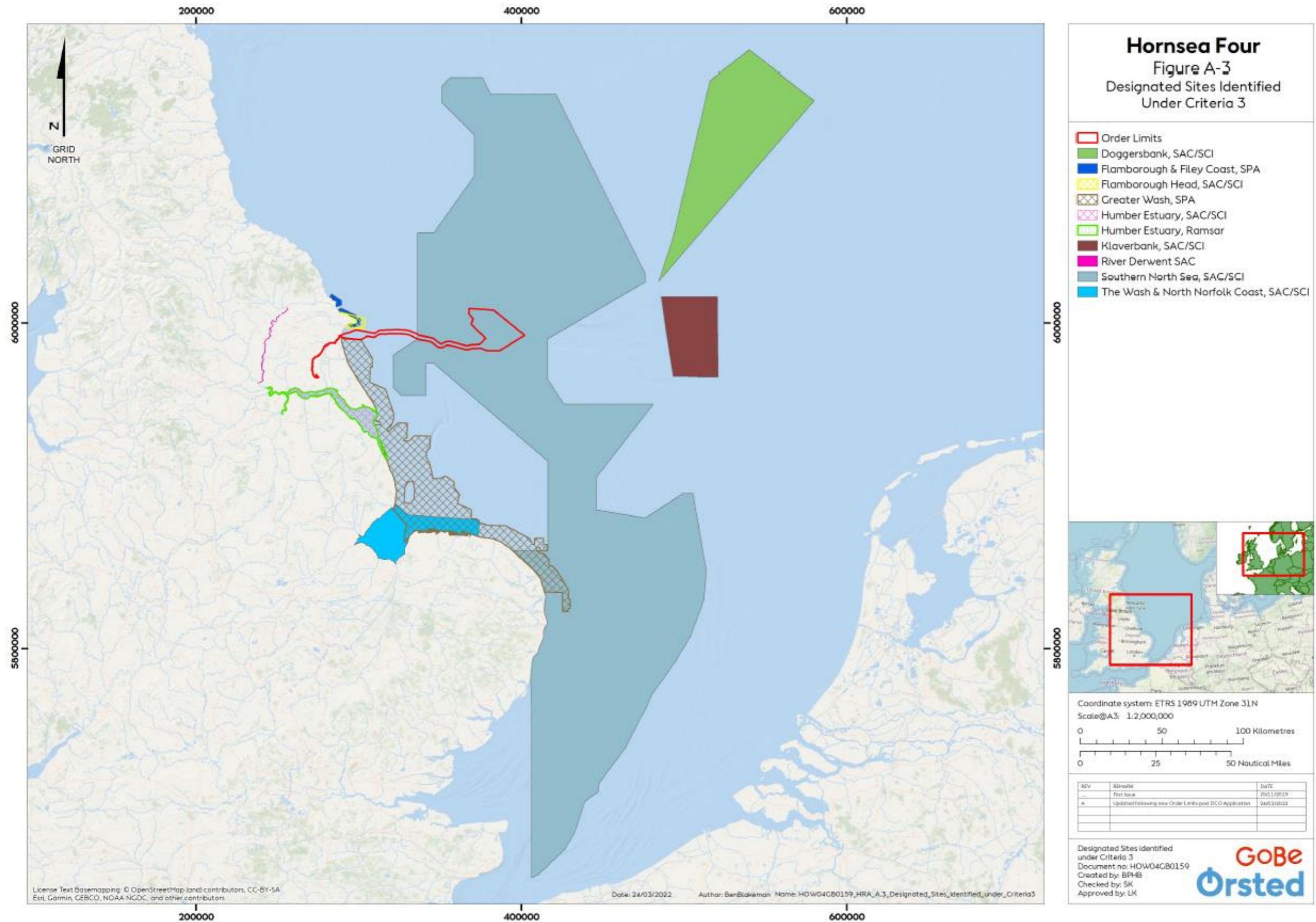


Figure 3: Protected sites identified using criteria 3.

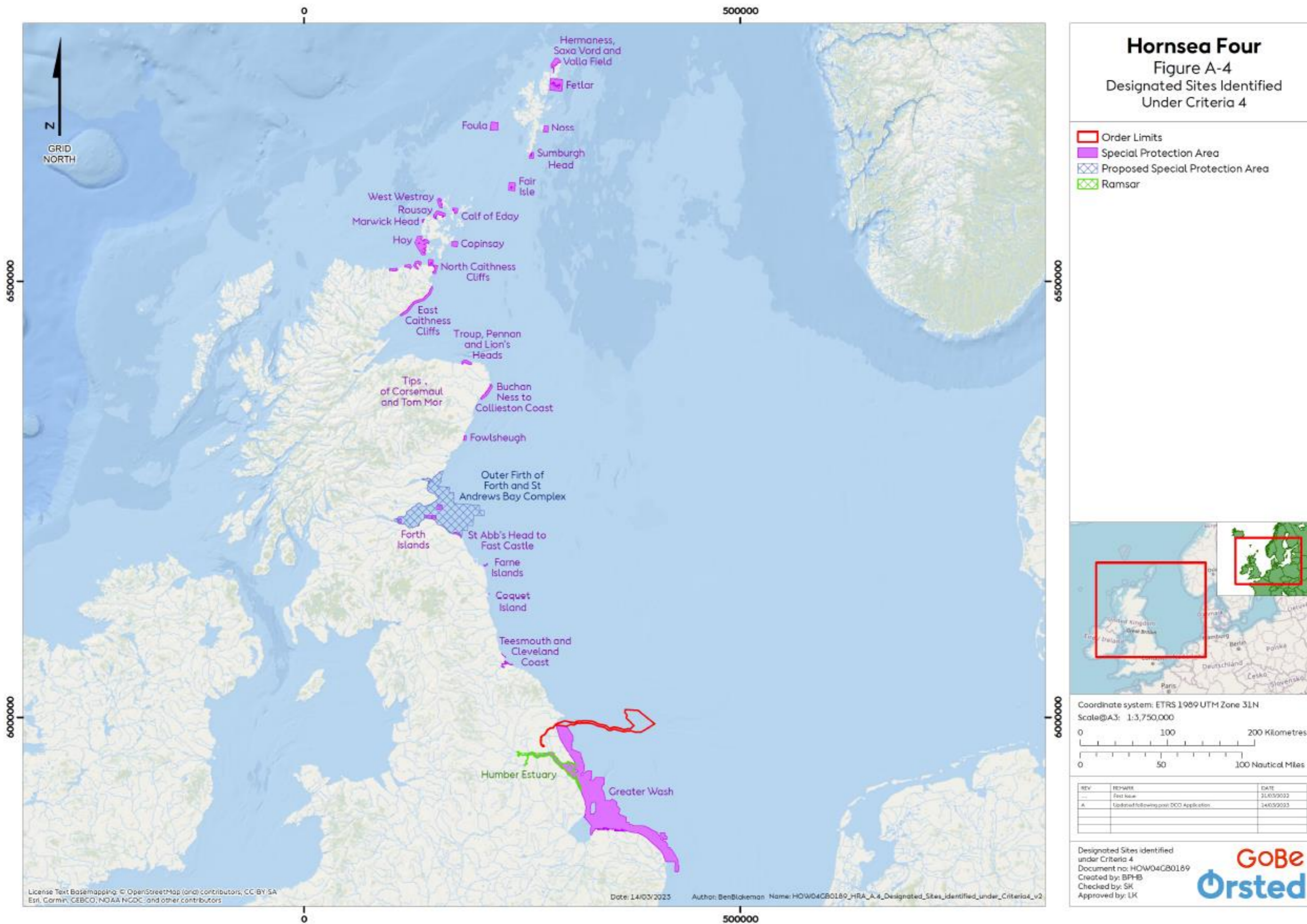


Figure 4: Protected sites identified using criteria 4.

Section 5 of the Applicants Report to Inform Appropriate Assessment Part 2: Appendix A: Habitat Regulations Assessment Screening Report [APP-168] (updated by [REP2-005] and in response to the third consultation letter) details the initial selection process undertaken to identify relevant protected sites and features for consideration in the LSE screening assessment. The selection process was dependent on the nature of the qualifying feature considered. The Applicant's HRA Report identified 40 protected sites and their qualifying features in the UK NSN for inclusion in the assessment. These are listed in Table 3 of the HRA Screening Report [REP2-005].

The Applicant's HRA Report grouped the qualifying features of the identified protected sites into receptor types:

- Subtidal and intertidal benthic ecology;
- Marine mammals;
- Offshore and intertidal ornithology;
- Onshore ecology; and
- Migratory fish.

Table 5 of [REP2-005] provided a detailed account of the potential impacts from the Project on the different receptor types, along with the potential geographical extent of effects. Tables 6 and 7 of [REP2-005] and Table 1 of the HRA Screening Matrices [AS-012] then confirmed which potential impact related to which protected site and qualifying feature. The Applicant considered that all potential impacts during the decommissioning phase would be similar to, and potentially less than, those outlined in the construction phase [REP2-005, Tables 5 and 6]. In respect of onshore ecology, the Applicant considered effects during the operation and maintenance phase would be similar to, but less than those outlined in the construction phase due to their lesser extent and shorter duration, for example repairing a short section of cable [REP2-005, Table 7].

The relation of receptor types to potential impacts is summarised in Table 2 below. Not all potential impacts were considered by the Applicant for each qualifying feature, with reasoning provided in the Applicant's HRA Report.

Table 2: Impact pathways considered by the Applicant in its screening assessment, by receptor type.

Qualifying features / receptor type	Impact Pathway ²⁷ C = construction; O = operation and maintenance; D = decommissioning	Relevant protected sites assessed
Subtidal and intertidal benthic ecology	Temporary habitat loss/disturbance	Flamborough Head SAC
	Temporary increase in suspended sediment/smothering	Humber Estuary SPA
	Accidental pollution	Humber Estuary SAC
	Spread of invasive non-native species (“INNS”) through introduction of hard substrate	Humber Estuary Ramsar site
	Increased nitrogen deposition (C & D)	Moray Firth SAC
	Changes to physical processes (O)	The Wash and North Norfolk Coast SAC
	Long-term physical loss of habitat (O)	Berwickshire and North Northumberland Coast SAC
	Electromagnetic Fields (EMF) (O)	
Marine mammals	Increase in underwater noise	Southern North Sea SAC
	Vessel disturbance	Moray Firth SAC
	Vessel collision risk	The Wash and North Norfolk Coast SAC
	Changes in prey availability and behaviour	Humber Estuary SAC
	Accidental pollution	Humber Estuary Ramsar site

²⁷ The impact is relevant to all phases of the Project unless explicitly stated.

	<p>Temporary increase in suspended sediment/ smothering (C & D)</p> <p>Long-term physical loss of habitat (O)</p>	Berwickshire and North Northumberland Coast SAC
Offshore and intertidal ornithology	<p>Direct disturbance and displacement</p> <p>Changes in prey availability and behaviour</p> <p>Risk of collision (O)</p> <p>Barrier effect (O)</p>	Greater Wash SPA
		Flamborough and Filey Coast SPA
		Coquet Island SPA
		Farne Islands SPA
		Humber Estuary SPA
		Humber Estuary Ramsar site
		Northumbria Coast SPA
		Teesmouth and Cleveland Coast SPA
		Northumberland Marine SPA
		St Abb's Head to Fast Castle SPA
		Forth Islands SPA
		Outer Firth of Forth and St Andrew's Complex SPA
		Fowlsheugh SPA
		Buchan Ness to Collieston Coast SPA
Troup, Pennan and Lion's Heads SPA		

		East Caithness Cliffs SPA
		North Caithness Cliffs SPA
		Copinsay SPA
		Hoy SPA
		Marwick Head SPA
		Rousay SPA
		Calf of Eday SPA
		West Westray SPA
		Fair Isle SPA
		Sumburgh Head SPA
		Noss SPA
		Fetlar SPA
		Hermaness, Saxa Vord and Valla Field SPA
		Lindisfarne SPA
		Lindisfarne Ramsar site
		Tips of Corsemaul and Tom Mor SPA
Onshore ecology	Temporary habitat loss	Humber Estuary SPA
	Temporary disturbance/ damage to habitats	Humber Estuary Ramsar site

	<p>Habitat fragmentation or severance</p> <p>Visual disturbance to species</p> <p>Noise disturbance to species</p> <p>INNS</p> <p>Accidental release of contaminants</p>	
Migratory fish	Temporary increase in suspended sediment/smothering	River Derwent SAC
	Increase in underwater noise	Humber Estuary SAC
	Temporary habitat loss/ disturbance	Humber Estuary Ramsar site
	Accidental pollution	

The Applicant described how it determined what would constitute a ‘significant effect’ in Section 6 of [REP2-005]. The Applicant’s screening conclusions were presented in Section 8 of the RIAA [APP-167, amended by AS-014] and [REP5-012]. The detail behind this summary was presented in the HRA Screening Matrices [APP-169, superseded by AS-012] and HRA Screening Report [APP-168, amended by AS-015].

The RIAA [APP-167, amended by AS-014] and [REP5-012] concluded that the Project would be likely to give rise to significant effects on one or more of the qualifying features of the remaining 36 protected sites assessed (in the subtidal and intertidal benthic ecology, marine mammal and offshore and intertidal ornithology receptor types). The Applicant concluded there would be no LSE in respect of impacts from the onshore elements of the Project. This was agreed with NE in its SoCG for onshore matters [REP7-062].

The Applicant’s conclusions of LSE on the protected sites identified and their qualifying features were disputed by IPs during the Examination. NE did not confirm agreement with the scope and conclusions of the HRA Screening Assessment and raised concerns in its Relevant Representations (“RRs”) and otherwise regarding sites and features for which no LSE was concluded. The ExA considered [ER 13.2.42] that there were a number of additional LSEs to those identified by the Applicant. Notably these are due to effects of changes to physical processes on Flamborough Head SAC and Humber Estuary SAC and Ramsar, effects of changes to physical processes on supporting habitats of the Humber Estuary SAC, and effects on primary production and prey availability for the Southern North Sea SAC and Humber Estuary SAC [ER 13.2.36]. Table 3 lists the sites for which LSEs could not be excluded by the ExA, either alone or in-combination [ER 13.5.4], alongside the relevant qualifying features and impact pathways. This list includes effects on protected sites and qualifying features for which the Applicant concluded LSE, together with the further effects on additional qualifying features which were disputed by IP’s during Examination and screened in by the ExA.

The ExA report [ER 13.2.27 et seq.] and the RIES provide further information on sites and features which were considered, but for which LSEs were screened out, notably for sea and river lamprey. 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 that assessment here.

The Applicant’s screening for LSE took account of the ruling of the European Court of Justice (ECJ) in *People Over Wind, Peter Sweetman v Coillte Teoranta (C-323/17)* (the “Sweetman Judgement”)²⁸ to ensure that no mitigation or avoidance measures were considered in reaching the conclusion as stated at paragraph 3.1.1.5 of the RIAA [APP-167].

The Secretary of State has carefully considered the potential effects of the application on all interest features of the protected sites, considering their conservation objectives, to determine whether there will be likely significant effects in the context of the Habitats Regulations and Offshore Habitats Regulations. The Secretary of State considers that sufficient information has been provided to inform a robust assessment in line with his duties under the Habitats Regulations and Offshore Habitats Regulations. In reaching his conclusions on LSE, the

²⁸ ECJ case reference C-323/17, available:

<http://curia.europa.eu/juris/document/document.jsf?docid=200970&doclang=EN> (Accessed 28/11/2022)

Secretary of State took no account of measures intended to mitigate effects on any protected site. The Secretary of State is satisfied that all LSEs that could result from the Project alone or in-combination with other plans or projects capable of assessment have been identified.

The Secretary of State recognises that powers are in place for decommissioning effects to be addressed fully by the relevant authorities prior to decommissioning, and taking account of more detailed information on decommissioning processes and environmental conditions at that time.

Table 3: Protected sites for which likely significant effects cannot be excluded.

Protected site	Qualifying features	Impact Pathway ²⁹ C = construction; O = operation and maintenance; D = decommissioning	Distance from the Project	SACOs
Subtidal and intertidal benthic ecology				
Flamborough Head SAC	Reefs	Temporary increase in suspended sediment or smothering Changes to physical processes (from impacts on Smithic Bank) ³⁰ Changes to the hydrodynamic regime (from impacts on the Flamborough Front) ³¹ Spread of INNS through introduction of hard substrate Accidental pollution	1.4 km from the offshore ECC 60.2 km from the array	See footnote ³²
	Submerged or partially submerged sea caves	Temporary increase in suspended sediment or smothering Spread of INNS through introduction of hard substrate Accidental pollution		
Humber Estuary SAC	Atlantic salt meadows	Nitrogen deposition (construction, decommissioning) Changes to physical processes (from impacts on Smithic Bank) ³⁰	32.2 km from the offshore ECC	See footnote ³³
	<i>Salicornia</i> and other annuals colonising mud and sand	Nitrogen deposition (construction, decommissioning) Changes to physical processes (from impacts on Smithic Bank) ³⁰	79.7 km from the array	

²⁹ The impact pathway is relevant to all phases of the Project unless explicitly stated.

³⁰ NE [RR-029] raised concerns that changes in elevation of Smithic Bank from cable installation and cable protection, along with alterations to sediment transport due to the Dogger Bank A and B cable crossing, could modify the Holderness shoreline morphology. This could indirectly affect other marine process receptors including the Humber Estuary SAC, SPA and Ramsar site and the Flamborough Head SAC. Furthermore, NE noted the importance of Smithic Bank for sandeel and other fish species, which are key prey for marine mammals [REP8-029]. This position was refuted by the Applicant [REP1-038]. Chapter 7 of the ExA's report provides further details on the concerns regarding the impacts from the installation of the offshore export cable on Smithic Bank that formed a key part of the Examination discussions, and they are not repeated here. As with the effects on Flamborough Front, the ExA considered there to be a credible impact pathway and on this basis the ExA cannot exclude LSE for these effect pathways and qualifying features [ER 13.2.36].

³¹ The Applicant had excluded the potential for any LSEs resulting from impacts on the Flamborough Front. However, NE and the MMO, advised by Cefas, [RR-029] and [REP5-107] stated that the Flamborough Front is a 'biodiversity hotspot' and thus the potential for changes resulting from the Project could have long-term effects on marine primary production and the wider marine ecosystem. They advised that further consideration be given to potential impacts in the context of the HRA, specifically in relation to the Flamborough Head SAC, the Flamborough and Filey Coast SPA, the Humber Estuary SAC, SPA and Ramsar site and the Southern North Sea SAC. Their concerns were that foundation structures could generate turbulent wakes and cold-water plumes in the array that could impact on the form and function of the Flamborough Front and have indirect effects on the hydrodynamic regime and primary productivity. Chapter 7 of the ExA's Report provides further details of the concerns relating to impacts on the Flamborough Front discussed during the Examination, which are not repeated here. The ExA considered [ER 13.2.33] that it is evident, given the extensive debate during Examination, that there are many uncertainties in this area, and it is clearly a matter that the statutory advisors have key concerns about. The ExA considers there to be a credible impact pathway and on this basis the ExA cannot exclude LSE. The protected sites and qualifying features for which a LSE is screened in from potential effects on prey availability during operation and maintenance are referenced. NE also advised [RR-029] that impacts on the Flamborough Head SAC from changes to the hydrodynamic regime (as a result of potential impacts on the Flamborough Front) should be screened in. The ExA also considers there to be a credible impact pathway, and on this basis could not exclude LSE [ER 13.2.33 et seq.].

³² <https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0013036&SiteName=flamborough%20head&SiteNameDisplay=Flamborough+Head+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=&NumMarineSeasonality=>

³³ <https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0030170&SiteName=humber%20estuary%20SAC&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=&NumMarineSeasonality=8>

	Atlantic salt meadows; <i>Salicornia</i> and other annuals colonising mud and sand - as supporting habitat for SPA and Ramsar site features	Nitrogen deposition (construction, decommissioning)		
	Sandbanks which are slightly covered by seawater at all times Mudflats and sandflats not covered by seawater at low tide Estuaries	Changes to physical processes (from impacts on Smithic Bank) ³⁰		
	Atlantic Salt Meadows <i>Salicornia</i> and other annuals colonising mud and sand Sandbanks which are slightly covered by seawater at all times Mudflats and sandflats not covered by seawater at low tide and Estuaries - as supporting habitat for SPA and Ramsar site features	Changes to physical processes (from impacts on Smithic Bank) ³⁰		
Humber Estuary Ramsar	Saltmarsh Saltmarsh - as supporting habitat for SPA and Ramsar site features	Nitrogen deposition (construction, decommissioning)	32.2 km from the offshore ECC 77.9 km from the array	See footnote ³⁴
	Impacts on the habitat features listed for the Humber Estuary Ramsar site in the context as supporting habitat for designated ornithological features	Changes to physical processes (from impacts on Smithic Bank) ³⁰		
Marine mammals				
Southern North Sea SAC	Harbour porpoise	Increase in underwater noise Vessel disturbance Vessel collision risk Accidental pollution Effects on primary production and prey availability (from impacts on Smithic Bank) ³⁰	Overlapping with the array and part of the ECC	See footnote ³⁷

³⁴ <http://jncc.defra.gov.uk/pdf/RIS/UK11031.pdf>

³⁷ <https://hub.jncc.gov.uk/assets/206f2222-5c2b-4312-99ba-d59dfd1dec1d#SouthernNorthSea-conservation-advice.pdf>

		Changes in prey availability and behaviour - indirect effects on prey availability (herring) from piling noise (construction) ³⁵ Increases in suspended sediment (construction) ³⁶ Changes to the hydrodynamic regime and primary production (from impacts on the Flamborough Front) ³¹		
Moray Firth SAC	Bottlenose dolphin	Increase in underwater noise (construction and decommissioning) Vessel disturbance Vessel collision risk	522.1 km from the offshore ECC 522.5 km from the array	See footnote ³⁸
The Wash and North Norfolk Coast SAC	Harbour seal	Increase in underwater noise (construction and decommissioning) Vessel disturbance Vessel collision risk ³⁹	100.1 km from the offshore ECC 105.4 km from the array	See footnote ⁴⁰
Humber Estuary SAC	Grey seal	Increase in underwater noise (construction and decommissioning) Vessel disturbance Vessel collision risk Changes to physical processes – effects on supporting habitats (including from impacts on the Flamborough Front) ³¹ Changes in prey availability and behaviour Effects on primary production and prey availability (from impacts on Smithic Bank) ³⁰ Changes to the hydrodynamic regime and primary production	32.2 km from the offshore ECC 79.7 km from the array	See footnote ³³

³⁵ LSE to harbour porpoise of the Southern North Sea SAC from changes in prey availability was screened out by the Applicant. NE [REP8-029] noted that herring is a key prey item of harbour porpoise. It had concerns that the impacts of piling on herring would result in less food for protected bird and marine mammal species off Flamborough Head and in the North Sea [REP5-112] and [REP8-029]. The Applicant assessed the potential impacts of piling on herring in the ES [APP-015] and concluded no significant effect from piling on herring, taking account of a proposed seasonal piling restriction at the offshore HVAC booster stations (Work No. 3) (secured in the draft DCO through Schedule 12, Part 2 – Condition 23). The appropriateness of this restriction was subject to discussion during the Examination. The ExA considered that such a restriction to protect the spawning herring should be considered as mitigation in accordance with case law (People Over Wind and Sweetman v Coillte Teoranta (Case C-323/ 17), “the Sweetman judgement”). The Secretary of State agrees and screens in this effect pathway and carries it forward to the AA.

³⁶ LSE to harbour porpoise of the Southern North Sea SAC from increases in suspended sediment [REP2-005, Table 6] and [AS-012, Matrix 1] was screened out by the Applicant. This was on the basis that harbour porpoise frequently occur in relatively turbid environments and because construction and decommissioning activities will be localised and intermittent in nature. The Applicant cited evidence in the ES [APP-016] for harbour porpoise foraging in low light levels and noted that the species also uses senses other than vision when foraging. NE [REP8-029] stated that “the Hornsea 4 Array lies wholly within the Southern North Sea SAC, and the MDS would permit a large volume of sediment to be disposed within the area during construction”. It expected the impact of increases in suspended sediment to be considered in the HRA. The Applicant’s Marine Processes Technical Report identifies a Zone of Influence for sediment dispersal of 15km for the offshore ECC and 10km for the offshore array [APP-067, Figure 1]. The ExA acknowledged that harbour porpoise are a mobile species, however, it considered that a clear LSE impact pathway exist [ER Table 13.2]. The Secretary of State screens in this effect pathway and carries it forward to the AA on a precautionary basis.

³⁸ <https://sitelink.nature.scot/site/8327>

³⁹ The Applicant initially screened out LSE to harbour seal from construction collision risk [AS-012, Matrix 4]. However, it later confirmed [REP8-011] that LSE should be screened in.

⁴⁰ <https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0017075&SiteName=the%20wash%20and%20north&SiteNameDisplay=The+Wash+and+North+Norfolk+Coast+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=2>

Humber Estuary Ramsar	Grey seal	Increase in underwater noise (construction and decommissioning) Vessel disturbance Vessel collision risk Changes to physical processes – effects on supporting habitats (including from impacts on the Flamborough Front) ³¹ Changes in prey availability and behaviour	32.2 km from the offshore ECC 77.9 km from the array	See footnote ³⁴
Berwickshire and North Northumberland Coast SAC	Grey seal	Increase in underwater noise (construction and decommissioning) Vessel disturbance Vessel collision risk	171 km from the offshore ECC 201.4 km from the array	See footnote ⁴¹
Offshore and intertidal ornithology				
Greater Wash SPA	Red-throated diver Common scoter	Disturbance and displacement (all project phases)	0.4 km from the offshore ECC	See footnote ⁴²
	Little gull	Collision (operation and maintenance)	63.4 km from the array	
Humber Estuary SPA and Ramsar	Shelduck Hen harrier Avocet Golden Plover Knot Dunlin Ruff Black-tailed godwit Bar-tailed godwit Redshank	Collision risk (operation and maintenance)	32.2 km from the offshore ECC 77.9 km from the array	See footnote ⁴³

⁴¹<https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0017072&SiteName=berwickshire%20and%20%20&SiteNameDisplay=Berwickshire+and+North+Northumberland+Coast+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=1>

⁴²<https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9020329&SiteName=greater%20wash&SiteNameDisplay=Greater%20Wash%20SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=6&HasCA=0>

⁴³<https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9006111&SiteName=humber%20estuary&SiteNameDisplay=Humber+Estuary+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=15>

	Waterbird assemblage			
	All qualifying features	Physical processes – impacts on supporting habitat due to impacts on Smithic Bank		
Hornsea Mere SPA	Gadwall	Collision (operation and maintenance)	12.9 km from the offshore ECC	See footnote ⁴⁴
Northumbria Coast SPA	Arctic tern	Collision (operation and maintenance)	144 km from the array	See footnote ⁴⁵
Teesmouth and Cleveland Coast SPA	Common tern Sandwich tern	Collision (operation and maintenance)	144 km from the array	See footnote ⁴⁶
Coquet Island SPA	Sandwich tern Common tern Arctic tern Roseate tern Kittiwake (unnamed component of seabird assemblage)	Collision (operation and maintenance)	167 km from the array	See footnote ⁴⁷
	Puffin (component of seabird assemblage)	Disturbance and displacement		
Farne Islands SPA	Sandwich tern Arctic tern Common tern Kittiwake (component of seabird assemblage)	Collision (operation and maintenance)	198 km from the array	See footnote ⁴⁸
	Guillemot Puffin (component of seabird assemblage)			

⁴⁴<http://publications.naturalengland.org.uk/file/4554917956288512>

⁴⁵<https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9006131&SiteName=Northumbria%20coast&SiteNameDisplay=Northumbria+Coast+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=4>

⁴⁶<https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9006061&SiteName=teesmouth&SiteNameDisplay=Teemouth+and+Cleveland+Coast+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=7>

⁴⁷<https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9006031&SiteName=coquet&SiteNameDisplay=Coquet+Island+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=4>

⁴⁸<https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9006021&SiteName=farne&SiteNameDisplay=Farne+Islands+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=5>

	Razorbill (unnamed component of seabird assemblage)	Disturbance and displacement ⁴⁹		
Northumberland Marine SPA	Common tern Arctic tern Roseate tern Sandwich tern Kittiwake (unnamed component of seabird assemblage)	Collision (operation and maintenance)	144 km from the offshore ECC 187 km from the array	See footnote ⁵⁰
	Guillemot Puffin	Disturbance and displacement		
St Abb's Head and Fast Castle SPA; Forth Islands SPA; Outer Firth of Forth and St Andrew's Complex pSPA; Fowlsheugh SPA; Buchan Ness to Collieston Coast SPA; Troup, Pennan and Lion's Heads SPA; East Caithness Cliffs SPA; North Caithness Cliffs SPA; Copinsay SPA; Hoy SPA; Marwick Head SPA; Rousay SPA; Calf of Eday SPA; West Westray SPA; Fair Isle SPA; Sumburgh Head SPA; Noss SPA; Foula	Relevant ornithological features screened in [APP-167, amended by AS-014] and [REP5-012]	Collision (operation and maintenance) Disturbance and displacement (operation and maintenance)	See Annex C of the RIAA [REP1-012, Matrices 18 to 37] for the relevant information.	See Appendix B of [REP2-005]

⁴⁹ Table 1 of the RIAA [APP-167, amended by AS-014] and [REP5-012] stated that razorbill, as a component of the seabird assemblage feature of Farne Islands SPA, was not included in the RIAA as it is outside the 'mean maximum plus 1 standard deviation'. However, NE [RR-029, Appendix B] advised that LSE from disturbance and displacement of razorbill (a component of the seabird assemblage feature) should be screened in, as for the other auk species, or further evidence provided to clarify why LSEs were not triggered. The Applicant reiterated the conclusion of no LSE in 'Razorbill Assessment: Alone and In combination Farne Islands SPA' [REP2-047] and [REP8-011]. It stated that the Farne Islands SPA population of razorbill would be an extremely minor component of the overall North Sea and English Channel Biologically Defined Minimum Population Scale across the wider non-breeding season (an apportionment rate of 0.08% during the migratory seasons and 0.20% during the winter season). Applying NE's range of displacement mortality rates, it predicted mortality of less than one breeding adult bird from the Farne Islands SPA across the non-breeding season. The Applicant concluded that this is so low as to be considered no material contribution to the natural baseline mortality rates at this colony and would not provide any meaningful contribution to in-combination effects. Nevertheless, NE [REP7-071] and [REP8-029] stated there is a clear impact pathway for razorbill and advised that LSE should be identified. Despite the low numbers of razorbill from the Farne Islands SPA potentially present in the array area, the ExA agreed that there is a potential impact pathway as some individuals may be present in the array area. The Secretary of State screens in this effect pathway and carries it forward to the AA on a precautionary basis.

⁵⁰ <https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9020325&SiteName=northumberland%20marine&SiteNameDisplay=Northumberland+Marine+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCArea=&NumMarineSeasonality=7>

SPA; Fetlar SPA; Hermaness, Saxa Vord and Valla Field SPA				
Flamborough and Filey Coast SPA	Gannet	Displacement and disturbance Collision mortality (operation and maintenance) Combined collision and disturbance (operation and maintenance) Barrier effects (operation and maintenance) ⁵¹	2.5 km from the offshore ECC 63 km from the array	See footnote ⁵²
	Kittiwake	Collision mortality (operation and maintenance) Barrier effects (operation and maintenance) ⁵¹		
	Guillemot	Displacement and disturbance Barrier effects (operation and maintenance) Impacts on supporting habitat (operation and maintenance) ⁵³		
	Razorbill	Displacement and disturbance Barrier effects (operation and maintenance) Impacts on supporting habitat (operation and maintenance) ⁵³		
	Seabird assemblage ⁵⁴	Collision mortality (operation and maintenance) Displacement and disturbance Barrier effects (operation and maintenance)		

⁵¹ The Applicant [AS-012, Matrix 24] screened out LSE from barrier effects on gannet and kittiwake during the operation and maintenance phase. NE [REP2-083], [REP3-015] and [REP5-111] queried why the RIAA only considers barrier effects on auks and only during the construction phase. The Applicant [REP5-074, HRA 2.5] explained that an assessment of potential barrier effects on gannet and kittiwake for the operation and maintenance phase was presented in ES Volume A2 Chapter 5 Offshore and Intertidal Ornithology [APP-017] and concluded negligible magnitude of impact and therefore neither species were screened in for assessment in the RIAA. It explained that the current (2022) SNCB interim displacement advice note states there is not enough evidence available to separate out and quantify barrier effects separately to displacement effects. Therefore, barrier effects are accounted for in the displacement assessments revised during the Examination [REP5-078], which cover all phases of the Project. In its response to the RIES [PD-015], NE [REP8-029] reiterated its position that LSE cannot be screened out for all phases of the Project, however, it was content that barrier effects are accounted for in the displacement assessment for these species.

⁵² <https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9006101&SiteName=flamborough%20and%20filey&SiteNameDisplay=Flamborough+and+Filey+Coast+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=4>

⁵³ The Applicant did not assess impacts on supporting habitat. NE suggested [RR-029] that the proximity of the Project area to the Flamborough and Filey Coast SPA and the high densities of guillemot and razorbill that appear to be present in August and September, could indicate functional linkages between the area array and the SPA colony that warrant consideration of SPA conservation objectives beyond population abundance (i.e. in relation to supporting habitats). It considered that the exclusion of birds from the array area would reduce the extent and distribution of their supporting habitat [REP7-104]. The ExA noted the Applicant's response [REP1-038], [REP5-085] and [REP5a-018] that the most important areas of sea for this species are not located in the Project array area and in particular are closer to the Flamborough and Filey Coast SPA colony during the breeding period and to a considerable distance to the south of the array area during the post-breeding period. However, given the clear usage of the site, the ExA considered there to be a credible impact pathway. The Secretary of State screens in this effect pathway and carries it forward to the AA on a precautionary basis.

⁵⁴ The Applicant's screening matrix [AS-012, Matrix 24] considered impacts on herring gull and puffin of the seabird assemblage only. NE [RR-029, Appendix B] requested full consideration be given to the potential impacts on the seabird assemblage feature of the Flamborough and Filey Coast SPA. The Applicant explained [REP1-038] that it had not addressed impacts on the component species of the seabird assemblage which had already been assessed in the species-specific assessment. The ExA considered that the LSE impact pathways which had been screened in for the component species assessed in the species-specific assessment should also be screened in for the Flamborough and Filey Coast SPA seabird assemblage.

		Combined collision and displacement mortality		
	All features (including seabird assemblage)	Changes in prey availability and behaviour - indirect effects on prey availability (herring) from piling noise (construction) ⁵⁵ Changes to the hydrodynamic regime and primary production (from impacts on the Flamborough Front) ³¹		

⁵⁵ NE [REP8-029] noted that herring is a key prey item of all Flamborough and Filey Coast SPA birds. See ³⁵ regarding the Southern North Sea SAC.

3.2 Likely Significant Effects Alone

The Secretary of State agrees with the recommendations of the ExA and concludes that LSEs cannot be excluded at the protected sites listed in Table 3, when the Project is considered alone. These sites are taken forward to the AA to consider whether the Project will result in an adverse effect upon the integrity of these sites.

The Applicant also submitted a screening exercise for LSE in relation to sites selected by the Applicant as potential HRA compensatory measures [APP-179] and [APP-180]. This is considered further in Section 11.5.

3.3 Likely Significant Effects In-Combination

Under the Habitats Regulations and the Offshore Habitat Regulations, the Secretary of State is obliged to consider whether other plans or projects in-combination with the Project might affect protected sites.

The Applicant addressed potential in-combination effects arising from the Project in Section 8.2 of the RIAA [APP-167, amended by AS-014] and [REP5-012], which set out the methodology applied. Section 8.2 was supported by the HRA Screening Matrices [APP-169, amended by AS-012] and HRA Screening Report [APP-168, amended by AS-015].

In respect of subtidal benthic ecology, marine mammals and offshore ornithology, the other plans and projects included in the in-combination assessment were set out in Tables 6, 7 and 9 of the RIAA [APP-167, amended by AS-014] and [REP5-012]. In respect of onshore ecology, Section 8.2.5 confirmed that nine projects had been identified for inclusion on the shortlist of projects to be assessed cumulatively for effects on onshore ecology and nature conservation and refers to ES Volume A3, Chapter 3: Ecology and Nature Conservation [APP-027, amended by AS-008] for further information.

The projects included in the in-combination assessment carried out by the Applicant were presented in Section 7 of Appendix A of the RIAA [REP2-005] for each of the receptor types assessed. The Applicant applied a 'tiered' approach to the in-combination assessment to reflect the different levels of uncertainty associated with the project design and timeframes for the projects screened into assessment. The allocated 'Tiers' reflect the current stage of the relevant projects within the planning and development process. This allowed the in-combination impact assessment to consider several future development scenarios, each with a differing potential for being ultimately built out. The three tiers consisted of:

- Tier 1
 - projects in operation (that do not form part of the baseline)
 - projects that are under construction.
 - permitted applications, whether under the Planning Act 2008 or other regimes, but not yet implemented.

- submitted applications, whether under the Planning Act 2008 or other regimes, but not yet determined.
- all refusals subject to appeal procedures not yet determined.
- Tier 2
 - projects on the Planning Inspectorate's Programme of Projects where a Scoping Report has been submitted.
- Tier 3
 - projects on the Planning Inspectorate's Programme of Projects where a Scoping Report has not been submitted.
 - 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.
 - identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

All impact-effect pathways identified were considered for their potential contribution to in-combination effects, regardless of whether potential LSE from the Project alone were identified at the screening stage.

The projects included in the in-combination assessment had been agreed with NE [RR-029] and no comments to the contrary had been submitted by any other IPs. The Applicant updated the scope of the in-combination assessment for the assessment as a whole at Deadline 5 in the updated RIAA [REP5-012] to acknowledge the submission of an EIA scoping request for the Northern Endurance Partnership Carbon Storage project. This found no change to the information used in the in-combination assessment for the Project or to the conclusions drawn.

The conclusions of the Applicant's screening exercise from the Project in combination with other plans or projects were subsequently summarised in Section 8 of the RIAA [APP-167, amended by AS-014] and [REP5-012]. The RIAA concluded that there would be no in-combination effects where an effect from the Project alone is insufficient to result in potential LSE. Section 8.2.6 confirmed that LSEs for migratory fish have been screened out given the lack of any viable pathway, therefore there would be no in-combination LSE.

In all cases, where the Applicant's screening exercise [APP-168, amended by AS-015] established the potential for LSE to arise from the Project alone, the potential for in-combination effects was also considered and discussed in the Applicant's RIAA [APP-167, amended by AS-014] and [REP5-012]. The Applicant did not identify any LSEs because of in-combination effects in addition to those identified as a result of the Project alone.

The ExA [ER 13.2.41] as a matter of principle, disagrees that combining effects that are not LSE automatically means that there can be no in-combination LSE, unless all are trivial and inconsequential. However, in looking at the specifics of this case, and noting that no concerns were raised with the approach, the ExA is content that there are no additional LSEs when the Project is considered in combination with other plans or projects, compared to the Project alone.

The Secretary of State agrees with the recommendations of the ExA and concludes that LSEs cannot be excluded at the protected sites listed in Table 3 when the impacts of the Project are

considered in-combination with other plans or projects. The protected sites listed in Table 3 are taken forward to the AA to consider whether the Project in-combination with other plans or projects will result in an AEol of these sites.

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 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 designated⁵⁶.

In line with the requirements of Regulation 63 of the Habitats Regulations and Regulation 28 of the Offshore 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 adverse effects on the integrity of the features of the protected sites identified can be ruled out as a result of the Project alone or in-combination with other plans or projects 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 law⁵⁷, the Secretary of State as the competent authority 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 adverse effects on integrity ("AEol") of the affected protected sites, 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 imperative reasons of overriding public interest ("IROPI"). In addition, Regulation 68 requires compensatory measures to be secured which maintain the overall coherence of the NSN.

⁵⁶ <https://www.gov.uk/guidance/appropriate-assessment#what-must-an-appropriate-assessment-contain>

⁵⁷ 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 Waddenzee and Nederlandse Vereniging tot Bescherming van Vogels v Staatssecretaris van Landbouw, Natuurbeheer en Visserij.

4.1 In-Combination assessment methodology

This assessment presents effects from the Project in-combination with other projects. Due to the range of receptors assessed, the projects which are relevant to the in-combination assessments will be different for each receptor.

The Applicant's methodology for the assessment of in-combination effects on integrity is set out in Section 11 of the RIAA [APP-167, amended by AS-014] and [REP5-012]. As with the LSE screening, the in-combination assessment adopts a tiered system to the projects considered, to address differing levels of certainty about their contribution to in-combination effects. Table 29 lists the other projects considered for each receptor type, excluding ornithology, which is addressed in Section 11.4. Section 8.2 sets out the approach to tiering the projects considered. Comments were received from NE on the tiering approach [RR-029] for marine mammals, as noted in Section 5.3 below.

Where effects from the Project alone were considered by the Applicant to be trivial and inconsequential, in-combination effects were excluded as the contribution of the Project would be imperceptible. NE raised concerns about the use of this approach in relation to offshore ornithology [RR-029], as detailed in Section 5.5 below.

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 his screening assessment, using best scientific evidence available. The assessment considers the site's conservation objectives, which are set out in Table 3 and subsequent sections of this HRA Report.

The RIAA submitted with the application for the Project [APP-167, later amended by AS-014] concluded that the Project would not result in an AEol of any protected site. However, the Applicant reconsidered its RIAA conclusions in light of the Secretary of State's decisions on the Norfolk Boreas and Norfolk Vanguard offshore wind farm projects [REP1-010], [REP2-038] and [AS-023] and concluded that the Project could result in AEol of the Flamborough and Filey Coast SPA due to:

- in-combination effects of collision on kittiwake.

This conclusion was reflected in the updated RIAA [REP5-012], was agreed with NE [REP3-018] and was not disputed by any other IP.

As with the screening exercise, a number of the debated AEol spanning different receptor type groups related to the potential for indirect effects as a result of impacts on the Flamborough Front and Smithic Bank.

5.1 Impact Pathways

The impacts considered to have the potential to result in LSE are:

- Subtidal and benthic ecology features:
 - Temporary increase in suspended sediment or smothering (all phases);
 - Changes to physical processes (impact on Smithic Bank);
 - Changes to the hydrodynamic regime resulting from impacts on the Flamborough Front;
 - Spread of INNS through introduction of hard substrate (all phases);
 - Accidental pollution (all phases); and
 - Nitrogen deposition (construction and decommissioning).
- Marine mammal features:
 - Increase in underwater noise (all phases);
 - Vessel disturbance (all phases);
 - Vessel collision risk (all phases);
 - Accidental pollution (all phases);
 - Changes in prey availability and behaviour – including indirect effects on herring availability from piling noise (construction);
 - Increase in suspended sediment; and
 - Changes to physical processes – effects on supporting habitats.
- Offshore and intertidal ornithological features:

- Disturbance and displacement (all phases);
- Collision (operation and maintenance); and
- Changes to physical processes – effects on supporting habitats.

5.2 Subtidal and intertidal benthic ecology

Sections 10.2 and 11.2 of the RIAA [APP-167, amended by AS-014] and [REP5-012] assessed the LSE pathways on subtidal and intertidal benthic qualifying features of protected sites from the Project alone and in-combination, respectively. Impacts were assessed for the:

- Flamborough Head SAC; and
- Humber Estuary SAC and Ramsar.

The Applicant concluded that the Project alone or in-combination would not result in an AEoI of any of these European sites. This relied on RIAA project commitments [APP-167, Table 3] and [REP5-012] which, alongside design measures, included the production of the following:

- Construction Environmental Management and Monitoring Plan (“CEMMP”) with a Marine Biosecurity Plan⁵⁸;
- Marine Pollution Contingency Plan (“MPCP”)⁵⁹;
- Scour Protection Management Plan⁶⁰; and
- Offshore Decommissioning Programme⁶¹.

The Applicant maintained this position throughout the Examination.

No concerns were raised during the Examination in relation to the following LSE pathways which were screened in for one or more of the protected site subtidal and intertidal benthic ecology qualifying features:

- Spread of INNS through introduction of hard substrate;
- Accidental pollution; and
- Nitrogen deposition.

Indirect effects from changes to the Flamborough Front or Smithic Bank remained a matter of dispute at the close of Examination. However, the ExA was content [ER 13.5.6] that subtidal and intertidal benthic ecological receptors would not be significantly adversely affected (see Section 5.4).

⁵⁸ Secured in the draft DCO through Schedule 11, Part 2 - Condition 13(1)(d)(iii) and Schedule 12, Part 2 – Condition 13(1)(d)(iii).

⁵⁹ Secured in the draft DCO through Schedule 11, Part 2 - Condition 13(1)(d)(i) and Schedule 12, Part 2 – Condition 13(1)(d)(i).

⁶⁰ Secured in the draft DCO through Schedule 11, Part 2 - Condition 13(1)(e) and Schedule 12, Part 2 – Condition 13(1)(e).

⁶¹ Draft DCO Schedule 11, Paragraph 6 of Part 1 states that this would need to be approved by the SoS at the time of decommissioning under section 106 of the Energy Act 2004.

The ExA was satisfied that the Project alone [ER 13.5.7] or in-combination [ER 13.5.14] would not affect the ability of any of the protected sites with subtidal and intertidal benthic ecology qualifying features to achieve their conservation objectives. Specifically, the ExA did not consider that the extent, distribution, structure or function of qualifying features would be negatively affected. In addition, it did not identify any potential for the supporting processes on which qualifying natural habitats rely to be significantly affected. Furthermore, the ExA does not consider that the combination of the LSE pathways from the Project would result in an AEol of protected site subtidal and intertidal benthic features.

As a result, the ExA concluded [ER 13.5.9 et seq.] there to be no AEol of protected sites from impacts on any subtidal or intertidal benthic qualifying features from the Project alone. The ExA was satisfied that all mitigation relied on to reach this conclusion is adequately secured in the rDCO.

The Secretary of States conclusions are presented in Table 4.

5.3 Marine mammals

Sections 10.3 and 11.3 of the RIAA [APP-167, amended by AS-014] and [REP5-012] assessed the LSE pathways on marine mammal qualifying features of protected sites from the Project alone and in-combination, respectively. Impacts on the following sites were assessed:

- Southern North Sea SAC;
- Moray Firth SAC;
- The Wash and North Norfolk Coast SAC;
- Humber Estuary SAC;
- Humber Estuary Ramsar site; and
- Berwickshire and North Northumberland Coast SAC.

The Applicant concluded that the Project alone or in-combination would not result in an AEol of any of the above protected sites. This relied on the project commitments detailed in Table 3 of the RIAA [APP-167] and [REP5-012] which, alongside design measures, included the production of the following plans:

- Marine Mammal Mitigation Protocol (“MMMP”)⁶² (as well as an anticipated requirement for an Unexploded Ordnance (“UXO”) MMMP, if a UXO clearance marine licence is applied for);
- Southern North Sea SAC SIP;
- Vessel management plan⁶³;

⁶² The MMMP would reduce the risk of Permanent Threshold Shift auditory injury from driven or part-driven pile driving. Its implementation would be secured through Condition 13(1)(g) of the draft DCO Schedule 11 and 12. The outline MMMP [APP-241] establishes the principles that would be implemented during construction.

⁶³ Secured in the draft DCO through Schedule 11, Part 2 - Condition 13(1)(d)(v) and Schedule 12, Part 2 – Condition 13(1)(d)(v).

- CEMMP;
- MPCP;
- Offshore Decommissioning Programme; and
- Decommissioning MMMP (subject to a separate marine licence at the point of decommissioning).

The Applicant maintained this position throughout the Examination. No concerns were raised during the Examination in relation to the following LSE pathways that had been screened in for one or more of the marine mammal protected sites:

- vessel disturbance; and
- accidental pollution.

Whilst changes in prey availability and behaviour for the harbour porpoise of the Southern North Sea SAC and the grey seal of the Humber Estuary SAC from impacts on the Flamborough Front or Smithic Bank remained a matter of dispute, the ExA was confident [ER 13.6.10 et seq.] that the availability of prey would not be significantly negatively affected (see Section 5.4). Similarly, it considered that only a small part of the Banks herring spawning ground would be temporarily affected by piling at the offshore HVAC booster stations (Work No. 3). Furthermore, whilst the final piling restriction proposed by the Applicant did not cover the complete period recommended by the MMO, the ExA considered that any effect would be restricted to a small portion of the spawning period in the shoulder months. Harbour porpoise of the Southern North Sea SAC forage widely on numerous food sources and thus the ExA did not consider that the conservation objective to maintain prey availability would be hindered.

The ExA was satisfied [ER 13.6.13] that the Project alone would not affect the achievement of any protected site conservation objectives for marine mammal qualifying features. Specifically, it did not consider that there would be significant disturbance of any marine mammal qualifying feature, or that the availability of prey would be significantly negatively affected. The ExA does not consider that the population or distribution of qualifying species would be affected.

Furthermore, given their short-term and minor nature, the ExA does not consider that the LSE pathways from the Project alone would combine to result in an AEol of any protected site marine mammal feature. As a result, the ExA concluded [ER 13.6.15 et seq.] there to be no AEol of any protected site from impacts on marine mammal qualifying features from the Project alone. The ExA was satisfied that all mitigation relied on to reach this conclusion is adequately secured in the rDCO.

5.3.1 Southern North Sea SAC - In-combination effects

The ExA considered [ER 13.6.9] that matters relating to alone underwater noise impacts on harbour porpoise of the Southern North Sea SAC were resolved during the Examination. Concerns regarding the approach to the assessment and the potential for in-combination noise impacts on the Southern North Sea SAC specifically, were discussed during Examination.

NE [RR-029] and [REP3-015] noted that different tiers were used in the RIAA in-combination assessment and the Cumulative Effects Assessment in the ES. The Applicant [REP3-046] explained that the RIAA tiering structure was more detailed than for the ES cumulative effects

assessment and considered a wider scope of projects. It provided a side-by-side comparison, which NE [REP5-112] was subsequently content with.

The Applicant's conclusion of no AEol of the Southern North Sea SAC was made subject to the implementation of the Southern North Sea SAC SIP⁶⁴. The SIP process was proposed by the Applicant to address uncertainty with regard to potential in-combination disturbance impacts from multiple projects, specifically in relation to the risk of an exceedance of the SNCB defined underwater noise disturbance thresholds. The Applicant submitted an Outline Southern North Sea SAC SIP [APP-246] that identified potential mitigation measures that could be implemented if required. NE [RR-029], [REP3-015] and [REP5-111, HRA 2.1] supported the Applicant's suggested approach to reducing noise impacts. However, it considered there to be various scenarios whereby underwater noise thresholds would be exceeded on an in-combination basis. NE noted that mitigation measures would be managed post-consent through the SIP process and raised concerns over the feasibility of adding mitigation at this late stage when decisions around cost, equipment type and so on had already been made. It therefore recommended that a commitment to delivering mitigation (including noise abatement systems) should be secured at this stage, with the later outcomes of the SIP determining if mitigation measures can be removed. Ultimately, NE [RR-029] could not rule out an AEol of the Southern North Sea SAC as a result of in-combination disturbance impacts due to what it considered to be an over-reliance on the SIP process to manage in-combination impacts. NE explained this issue was not unique to the Project and advised that a mechanism to manage, monitor and review multiple SIPs over varying timescales needed to be developed and put in place by regulators. The Applicant [REP1-038] noted NE's comment but considered the SIP process to be the most appropriate mechanism for managing in-combination impacts. NE's position regarding the implementation of SIPs was maintained until the close of Examination [REP8-029] and [REP8-031], with NE stating that it will not be possible to rule out in-combination AEol until the post-consent SIP is provided for assessment. Notwithstanding its objection in principle, NE made several comments on the outline SIP [RR-029], which the Applicant responded to [REP1-038]. The Applicant updated the outline SIP at Deadline 7 [REP7-054] and included text detailing the process for determining mitigation. Whilst NE continued to advocate that committing to mitigation would have been preferable, it considered the Applicant's approach to be an acceptable compromise [REP8-031].

The MMO [REP3-052] and [REP5-107, HRA 1.16] stated it was confident in the current SIP process, following a Review of Consents ("RoC") process. It confirmed that it utilises the Offshore Petroleum Regulator for Environment and Decommissioning Southern North Sea SAC Tracker to ensure that all projects proposed to be undertaken within the Southern North Sea SAC for each season every year are taken into account when discharging a SIP condition. However, it requested a standard stand-alone condition be applied in relation to designated sites for harbour porpoise, to be in line with the RoC, as this would enable efficient management of SIPs. The Applicant [REP5-074, HRA 2.1] did not consider it necessary to amend the drafting of condition

⁶⁴ Schedule 11, Part 2 and Schedule 12, Part 2 Condition 13(1)(j)) of the draft DCO requires a Southern North Sea SAC SIP to be submitted to the MMO for approval prior to the commencement of driven or part-driven foundations.

13(1)(j) of Part 2 of Schedules 11 and 12, which it considered to be more precise and enforceable, and which specifically required the MMO to be satisfied that mitigation avoids AEoI. The MMO maintained its position at the close of Examination [REP8-004]. The MMO [REP8-022] also considered the Deadline 7 version of the SIP to be robust and to contain the necessary information required at this stage, though it sought clarity over terminology regarding concurrent and simultaneous piling. The Applicant [REP7-083] confirmed that the MMO's understanding was correct, and that "concurrent piling refers to up to two piles being installed within a 24-hour period, one after the other. Simultaneous piling, which may also occur, refers to two piles being installed at the same time within a 24-hour period".

The ExA noted [ER 13.6.33] that NE's outstanding concerns in respect of in-combination noise impacts relate to mechanisms for strategic regulatory control, rather than further actions required by the Applicant. This matter is common to a number of recently proposed wind farm developments in the North Sea, and the ExA was aware that the Secretary of State has been satisfied with the approach on recently consented offshore wind farms, including the East Anglia ONE North and East Anglia TWO Offshore Wind Farms. The ExA acknowledged the MMO's confidence in the process and considers that it has been provided with sufficient assurance that all plans or projects will be taken into account when the final SIP is submitted. The ExA therefore concluded an AEoI from in-combination noise impacts can be excluded. With regard to MMO's request for a standard RoC condition, the ExA notes that the new standard condition has been used in recent comparable DCOs (e.g. the East Anglia ONE North and East Anglia TWO Offshore Wind Farm Orders). The ExA agreed [ER 13.6.35] with the MMO's suggestion to use this to facilitate the efficient management of SIPs and has recommended that Condition 13(1)(j) be deleted and that a standalone Condition be inserted into Schedules 11 and 12, Part 2.

The ExA [ER 13.6.36] was content that there is no AEoI of any protected site due to impacts from any other LSE pathway on marine mammal qualifying features from the Project in combination with other plans or projects.

The Secretary of States conclusions are presented in Table 4.

5.4 The Flamborough Front and Smithic Bank

5.4.1 The Flamborough Front

Considerable time was spent in the Examination discussing the relationship between the Project and a phenomenon known as the Flamborough Front [ER 7.4.71]. This is a seasonal, tidal-mixing front that forms at the boundary between the southern and northern North Sea.

As noted in Section 3, the ExA screened in the potential for indirect effects on prey availability for qualifying features of the Southern North Sea SAC, Humber Estuary SAC and Ramsar site and the Flamborough and Filey Coast SPA as a result of impacts on the Flamborough Front.

Chapter 7 of the ExA's report details the key matters discussed during the Examination regarding the Flamborough Front. In terms of implications for the HRA, the Applicant did not agree that further consideration in the context of HRA was required as the mitigation proposed in its Application would reduce impacts and that no new impacts arose that invalidated the HRA submitted with the application [REP5a-017]. The Applicant considered [REP5-066] that the

quantity of nutrients in the area would not change, therefore it could not see how the primary production would change.

In respect of birds, the Applicant's Indirect Effects of Forage Fish and Ornithology [REP5-085] identified Atlantic herring, sandeel and sprat as key forage fish of relevance to qualifying features of the Flamborough and Filey Coast SPA. It stated that nursery grounds for these fish are located across the North Sea, rather than focused on a particular area near the Front system. It concluded that any nutrient and plankton upwelling is associated with the interaction between background hydrodynamic processes and bathymetry and not a function discrete to the Flamborough Front. It acknowledged that the distributions of forage fish and seabird density may be linked to the position of the Flamborough Front at certain times of the year (summer): however, outside the summer, the distributions of forage fish and seabird density may be linked to water depth (bathymetry) and benthic ecology. It noted that the higher seabird density areas to the south of the array area coincide with shallower depth waters, where more of the water column is accessible to seabirds to exploit forage fish more easily than other areas that have deeper waters. Furthermore, it noted the spatial and temporal aspects of the Flamborough Front are highly variable, thereby making it difficult to conclude strong relations between post-breeding auk dispersal and the formation and extent of the Front. The Applicant concluded that any impacts would not alter biological functioning at a regional sea scale (North Sea), but it would be limited to tens or hundreds of metres around the location of individual foundations.

In respect of impacts on marine mammals, the Applicant's response [REP8-011] to the RIES [PD-015] highlighted their large foraging ranges and considered NE had not provided any scientific evidence to counter the Applicant's conclusions.

NE in its responses [REP6-060] agreed with the Applicant that there was limited direct evidence to explain how important the Flamborough Front is for forage fish, and how it drives the distribution and abundance of forage fish at a more detailed scale. Therefore, it contended that the distinctions made by the Applicant of the relative importance of the proposed array area compared to other locations in the vicinity of the Front should be given limited credence. NE [REP6-060], [REP7-103] and [REP8-029] did not believe the Applicant had provided sufficient evidence to rule out the potential for changes to oceanographic processes that govern the occurrence of the Flamborough Front and more localised but still extensive marine processes. It stated that such processes may have a significant influence on the distribution and abundance of forage fish in the area, which in turn could impact the distribution, abundance and, potentially, survival of piscivorous seabirds and in particular the survival of guillemot and razorbill during the chick rearing and moult period. It considered [REP5-114] there to be, *“the potential for large-scale changes to annual primary productivity due to the presence of the Hornsea Four array, either alone and/or in-combination with a cluster of OWFs, due to impacts on the Flamborough Front”*.

The RSPB supported NE's position [REP7-099].

5.4.2 Smithic Bank

Smithic Bank is an offshore sand bank that has formed in the centre of gyre, generated as the tidal flow curves around Flamborough Head. It stretches roughly 12km southwards from just south of Flamborough Head.

As noted in Section 3, NE [RR-029] and the MMO [RR-020] raised concerns that changes in the elevation of Smithic Bank from cable installation and cable protection, along with alterations to sediment transport due to the Dogger Bank A and B cable crossing, could modify the morphology of the Holderness shoreline and indirectly affect the Humber Estuary SAC, SPA and Ramsar site and the Flamborough Head SAC.

Impacts on Smithic Bank were discussed during the Examination, as detailed in Chapter 7 of the ExA's report, alongside information on changes made by the Applicant to the MDS⁶⁵. The MMO and NE [REP5-107] and [REP8-031] stated that considerable uncertainty remained in relation to the baseline characterisation of Smithic Bank and advised that further consideration be given to potential impacts in the context of the HRA; however, specific potential impacts in an HRA context were not discussed.

Furthermore, NE [REP7-103] advised that in-combination effects from cable installation with other developments (listed by NE as Dogger Bank A and B, Scotland England Green Link 2 Cable and Dogger Bank South) may alter the morphology of the sandbank through the combined influence of sediment removal and changes to transport pathways and sought a detailed assessment of the cumulative impacts of multiple developments. It also highlighted concerns relating to in-combination impacts from the placement of cable protection.

The Applicant [REP8-016] responded that NE's comments lacked specificity, supporting analysis and evidence. It stated that it was unclear what sites, features, pathways and impacts NE was referring to, or why such effects were likely to be significant. It reiterated its conclusion of no AEoI from the Project alone or in-combination in relation to impacts on marine processes.

5.4.3 Conclusions on marine processes

By the close of Examination, NE remained of the view that it could not rule out AEoI from indirect effects resulting from impacts of the Project (alone or in combination with other plans or projects) on both the Flamborough Front and Smithic Bank.

The ExA agreed that the science was imprecise, and that post-construction monitoring would be appropriate to establish the accuracy of assumptions made in the ES. It is aware of the more stringent requirements of the HRA Regulations; as explained in NE's statement [REP8-029] that a HRA, "*needs to be thorough, based on the best available evidence, with no lacunae, and that there needs to be certainty beyond reasonable scientific doubt in its conclusions*". However, the ExA also acknowledges the extensive work undertaken by the Applicant during the Examination to address NE's concerns. The Applicant [REP8-016] stressed that it had exhausted all evidence gathering and presentational avenues and provided far greater detail on the topic than for other projects in the vicinity of the Project.

The ExA [ER 13.4.25] agrees with the Applicant that some of NE's comments on marine processes, particularly regarding Smithic Bank, lack specificity on the features and pathways of effect. The ExA sought clarity on some matters in the RIES [PD-015] but NE did not provide further explicit details about what the exact indirect effects on habitat qualifying features of

⁶⁵ Primarily a 25.8 % reduction in maximum volumes for bedform clearance, a reduction in cable protection across Smithic Bank from 10 % to 5 %, and a reduction in the maximum number of gravity base structures from 110 of the 180 turbine locations to 80.

protected sites from impacts on Smithic Bank could be, for example, habitat damage or loss. As such, the ExA has struggled to afford weight to generalised comments.

The ExA [ER 13.4.26] saw no compelling evidence of likely marine processes or other direct or indirect pathways between Smithic Bank and sensitive protected sites in this respect. It sought clarity through questions in the RIES but received no further detail. Similarly, the ExA was not presented with any credible evidence that supporting habitats for any SPA or Ramsar site would be significantly affected by impacts resulting from any changes to Smithic Bank.

In respect of the Flamborough Front, the ExA [ER 13.4.27] noted that impacts would not occur annually as the Front's location is not fixed. Furthermore, whether and what proportion of the Front would be affected is unknown. The ExA noted that the science was imprecise but was satisfied that the impacts would be of a local scale and temporary nature in the context of the whole length of the Front. It saw no compelling evidence to demonstrate that any impacts would substantially exceed the average, long-term annual variability of the Front, that marine mammal and seabird foraging range is defined by the location of the Flamborough Front, or that their food resource as a whole would be affected to such a degree that the integrity of the protected site would be compromised.

Ultimately, due to the nature of the qualifying features and the imprecise science, the ExA [ER 13.4.28] considered that it was not possible for the Applicant to demonstrate with absolute surety that there would be no indirect effects from changes to the Flamborough Front and Smithic Bank. However, given the evidence presented by the Applicant and the independent expert review⁶⁶, the ExA considers it most unlikely that any such effects would be of sufficient magnitude to affect the integrity of any protected site.

Whilst NE highlighted the potential for in-combination effects as a result of marine processes, this was not explored in detail during the Examination as the Applicant found no potential for individual AEoI. The ExA [ER 13.4.29] was content with this conclusion. The ExA also notes that the SNCB would be involved in the process of discussing and approving final versions of the various management plans through DML conditions in the recommended DCO, providing further opportunity to influence mitigation and monitoring measures, providing further reassurance about this conclusion.

5.4.3.1 Additional information

In the fourth consultation letter, with regards to the Applicant's proposed monitoring of the effects of the gravity-based structures on the Flamborough Front, the Secretary of State invited the Applicant to provide details of the impact which any reductions to turbine numbers or the array area due to Protective Provisions might have to the potential adverse effects on the Flamborough Front identified by IPs during Examination. Furthermore, with regards to the proposed monitoring of the effects of the gravity-based structures on the Flamborough Front, the Applicant was invited to advise whether or not it has considered what the trigger levels for adaptive management might be and identify any adaptive management measures that could be implemented should an adverse impact be detected.

⁶⁶ See Chapter 7 of the ExA's report for details of the independent peer review by Professor Mike Elliott [REP5-066].

The Applicant responded on 17 April 2023⁶⁷. It reiterated that it has proposed near-field and far-field monitoring, as set out in Table 3 of the Outline Marine Monitoring Plan, to seek to address NE's perceived uncertainty of the assessment of effects of the GBS on the Flamborough Front in the ES. Nevertheless, the Applicant stated that it was seeking to discuss the matter with NE, with the aim of reaching agreement prior to responding to the fifth consultation letter. In response to the fifth consultation letter on 16 May 2023, the Applicant²⁴ stated that it committed to removing GBS as a foundation type for WTGs in the design envelope of the Project. The Applicant considered that this removes the potential for individual turbines to act in-combination with each other. Draft DCO amendments were proposed by the Applicant to give effect to this commitment. It also provided an updated OMMP⁶⁸ for the relevant near-field and far-field monitoring to apply to other foundation types, and to clarify the extent of the monitoring as requested by NE, and to give consideration to marine processes in the final layout design of the array where possible and to inform selection of the monitoring locations, to be agreed by the MMO. The Applicant stated that it had discussed with NE what the trigger levels for adaptive management might be and sought to identify any measures that could be implemented should an adverse effect be detected. Both parties agree that no feasible/practicable adaptive management measures are available, but that a Project commitment to monitoring will support better understanding of the Flamborough Front.

In the eighth consultation letter, the Secretary of State invited NE to comment on the Applicant's proposal to remove GBS from the project design envelope and the monitoring and adaptive management commitments, including the proposed changes to the OMMP. NE responded on 16 June 2023⁶⁹. NE welcomed the Applicant's commitment to remove GBS from the design envelope, which it considers will significantly reduce the risks of wake-related effects and enhanced turbulent mixing impacting upon the functioning of the Flamborough Front. Whilst this will significantly reduce the risk of adverse effects on FFC SPA and a wider range of receptors, there remains residual concerns regarding the impacts of marine processes that will require before-after post-consent monitoring. NE stated that it has engaged constructively with the Applicant to develop monitoring proposals, which remain in line with its advice provided during the Examination. NE agree with the Applicant that specific, physical adaptive management measures are not practicable for impacts of this nature, however NE consider that any impacts identified through the monitoring process should theoretically end with the removal of monopiles at decommissioning. Having reviewed the submitted OMMP, NE welcome the proposed pre- and post-construction monitoring for Smithic Bank and look forward to reviewing the survey reports. NE also welcome the proposed near-field and far-field monitoring of the Flamborough Front and broadly agree with its content. However, NE noted that on page 17 of the plan, it is stated that there will be 'no requirement for further post-construction monitoring of Hornsea Four' following the provision of the 5-year post-construction report. NE do not support this approach

⁶⁷<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002270-G12.1%20Applicant's%20Response%20Letter%20to%20RFI%20dated%2020%20March%202023.pdf>

⁶⁸<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002295-F2.7%20Outline%20Marine%20Monitoring%20Plan%20TRACKED.pdf>

⁶⁹<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002320-EN010098%20-%20Hornsea%20Four%20Request%20for%20Information%20-%20NE%20Response%20160623%20-%20SoS%20Consultation%20Response.pdf>

and advise that the requirement for further monitoring should be dependent upon the findings of the monitoring report. Therefore, NE recommended that there is a review after the 5-year period, including a discussion of the evidence in a joint workshop between the Applicant, MMO, Cefas, NE (and leading experts where possible) to determine further actions as necessary.

The Secretary of State notes the evidence presented by the Applicant and the independent expert review, and considers that this has advanced discussions regarding potential impacts, and the Applicant's view that it had exhausted all evidence gathering and presentational avenues. The Secretary of State notes NEs advice that GBS have significantly larger dimensions and, thus, far greater potential for turbulent mixing of the water column than for monopile foundation structures [REP7-103]. He therefore considers that the removal of GBS for the WTG foundations from the MDS and the proposed additional monitoring of other foundation types provide additional certainty to that available to the ExA, that significant changes to marine processes resulting from the Project would be unlikely. The Secretary of State also notes NEs broad agreement with the proposed scheme of monitoring.

The Secretary of State considers that the assessment of impacts has been undertaken using the best available scientific evidence and that no compelling evidence has been presented to suggest that potential changes to the Flamborough Front and Smithic Bank could be of a magnitude to result in an AEoI of any protected site. The Secretary of State agrees with the ExA that an AEoI of any protected site due to indirect effects from changes to the Flamborough Front and Smithic Bank can be excluded.

5.5 Offshore and intertidal ornithology (Excluding the Flamborough and Filey Coast SPA and the Greater Wash SPA)

Sections 10.4 and 11.4 of the RIAA [APP-167, amended by AS-014] and [REP5-012] assessed the LSE pathways to offshore and intertidal ornithological qualifying features of protected sites from the Project alone and in-combination, respectively. Impacts on the following sites were assessed:

- Protected sites in England:
 - Flamborough and Filey Coast SPA;
 - Greater Wash SPA;
 - Hornsea Mere SPA;
 - Humber Estuary SPA;
 - Humber Estuary Ramsar site;
 - Northumbria Coast SPA;
 - Teesmouth and Cleveland Coast SPA;
 - Coquet Island SPA;
 - Farne Islands SPA; and
 - Northumberland Marine SPA.
- Protected sites in Scotland:
 - St Abb's Head to Fast Castle SPA;
 - Forth Islands (UK) SPA;
 - Outer Firth of Forth and St Andrew's Complex SPA;
 - Fowlsheugh SPA;
 - Buchan Ness to Collieston Coast SPA;
 - Troup, Pennan and Lion's Heads SPA;
 - East Caithness Cliffs SPA;
 - North Caithness Cliffs SPA;
 - Copinsay SPA;
 - Hoy SPA;
 - Marwick Head SPA;
 - Rousay SPA;

- Calf of Eday SPA;
- West Westray SPA;
- Fair Isle SPA;
- Sumburgh Head SPA;
- Noss SPA;
- Foula SPA;
- Fetlar SPA; and
- Hermaness, Saxa Vord and Valla Field SPA.

The RIAA [APP-167, amended by AS-014] and [REP5-012] explained that the Applicant had progressively refined the developable area of the Project from 846km² at scoping stage to 468km² for the DCO application. Table 3 noted that the developable area was selected to avoid areas with the highest concentrations of birds that were more likely to be displaced by construction activities or fly within the rotor swept zone and hence be at risk of collision.

The Applicant's assessment also relied on the project commitments detailed in Table 3 of the RIAA [APP-167, amended by AS-014] and [REP5-012] which, alongside design measures, included the production of the following:

- a vessel management plan; and
- an Offshore Decommissioning Programme.

The Applicant concluded that the Project alone and in-combination would not result in an AEol of any protected site (except the Flamborough and Filey Coast SPA) as a result of impacts on offshore and intertidal ornithological qualifying features.

The ExA was satisfied [ER 13.7.10 et seq.] that the Project alone would not affect the ability of any protected site's (excluding the Flamborough and Filey Coast SPA) offshore and intertidal ornithology qualifying feature to achieve its conservation objectives. Specifically, it did not consider that there would be any effect on the population and distribution of each qualifying feature, nor on the supporting habitats or processes upon which they rely, including the availability of prey. Furthermore, the ExA did not consider that the combination of the LSE pathways from the Project alone would combine to result in an AEol of any protected site ornithological feature. The ExA notes that this is supported by NE's End of Examination Position on Offshore Ornithology [REP7-104] and that the RSPB [REP8-005] confirmed its agreement that the conclusion of no AEol as a result of the project alone or in-combination was appropriate for all sites except the Flamborough and Filey Coast SPA. The ExA was satisfied that all mitigation relied on to reach this conclusion is adequately secured in the recommended DCO.

Concerns regarding the approach to the in-combination assessment were raised during Examination. For a number of the impact-effect pathways on qualifying features, the Applicant concluded that the effects from the Project alone were trivial or within what could be expected as a result of natural variation in baseline mortality, and that they could make no perceptible, consequential contribution to effects in combination [APP-167, amended by AS-014] and [REP5-012]. For this reason, an in-combination assessment for those features in relation to those

impact-effect pathways was excluded. It is noted that the precise rationale and justification for the approach varies with the feature and impact pathway being assessed and is set out in the RIAA in each case.

NE raised a concern with this rationale in relation to offshore ornithology [RR-029] and [REP5-112], advising that even non-significant levels of predicted mortality at the project alone level should be added to the in-combination totals for a species. NE specifically requested an in-combination assessment be undertaken for red-throated diver and common scoter from the Greater Wash SPA, despite the assessment for the project alone concluding that there was no potential for a material contribution to baseline mortality [RR-029]. The Applicant confirmed in its Assessment of Common Scoter and Red Throated Diver in the ECC [REP2-049] that it did not deem such an assessment to be appropriate as there would be no material contribution from the Project to any in-combination displacement effects. NE [REP3-054] subsequently agreed there would be no in-combination effects.

The ExA requested NE to identify any additional features and relevant impact-effect pathways where it disagreed with the rationale for excluding an in-combination assessment in the RIES [PD-015], but no response was received. NE [RR-029] also noted that the minimum and maximum in-combination predicted impacts (based on central values for other projects and the range for the Project) had not been provided (for all species) to allow consideration of uncertainty. The Applicant [REP1-038] explained it provided central estimates in order to provide 'a level playing field approach' to assessing in-combination impacts. It considered this allowed for a reliable assessment that reduced inherent bias from including minimum and maximum values that could lead to under- or over-inflated results. Further to the Applicant's revised assessment, NE noted [REP8-031] that whilst it disagreed with the Applicant's approach to present a single value, it based its conclusions on the range of values calculated using its own bespoke approach.

The ExA [ER 13.7.25] noted NE's concerns regarding the approach to assessing in-combination effects. However, it understood that this approach has been accepted practice where the effects can be shown to be imperceptible. It welcomed the Applicant's revised assessment for the Greater Wash SPA and is content with the approach.

NE agreed at Deadline 3 [REP3-054] that an AEoI could be excluded for impacts on red-throated diver and common scoter from the Greater Wash SPA for the Project alone or in combination with other consented plans and projects. However, at Deadline 7 and Deadline 8 [REP7-104] and [REP8-029], it stated that it was unable to rule out an AEoI with the inclusion of Sheringham and Dudgeon Extension Projects in the in-combination assessment, due to the lack of detailed information available regarding these projects.

The ExA [ER 13.7.27] acknowledged NE's concerns but noted that the Applicant did include these projects to the extent possible in its in-combination assessment [APP-167, amended by AS-014] and that NE did not expand on its concerns or provide its own assessment of effects for the Greater Wash SPA. NE did not address this site in detail in its End of Examination Position on Offshore Ornithology [REP7-104].

The ExA noted [ER13.7.28] that a DCO application was due to be made for the Sheringham and Dudgeon Extension Projects shortly after the Examination for the Project closed. The application would be accompanied by a RIAA. It was not possible for this information to be taken into account

during the Examination. The ExA considered that, on the basis of information available to it, there would not be an AEol from the Project in combination with other plans or projects. However, it recommended that the Secretary of State may wish to reconsider the potential for in-combination effects based on this additional information in respect of Sheringham and Dudgeon Extension Projects should it become available before a decision is made.

Further consideration of the Flamborough and Filey Coast SPA and the Greater Wash SPA is presented in Sections 5.7 and 5.8 respectively.

With regard to Humber Estuary SPA and Ramsar site, NE could not rule out an AEol from the Project alone for ornithological features and consequently did not comment on in-combination effects. Its concerns related to indirect effects from changes to physical processes [REP7-103]. As noted in Section 5.4, the ExA [ER 13.7.29] concluded there would be no AEol from this impact pathway as a result of in-combination effects. NE did not raise any concerns regarding the in-combination assessment for any of the other SPA and Ramsar sites assessed by the Applicant. The ExA was content [ER 13.7.30] that AEol as a result of impacts from the Project alone and in combination can be excluded for all protected sites offshore and intertidal ornithology qualifying features, excluding the Flamborough and Filey Coast SPA.

The Secretary of States conclusions are presented in Table 4.

5.6 Appropriate Assessment: protected sites for which AEol can be excluded

Table 4 presents the Secretary of State's conclusions on protected sites for which he considers there to be no AEol and for which the ExA was also satisfied that an AEol of these sites and their qualifying features could be excluded. IP representations, SNCB advice and ExA recommendations are referenced and documented in the Table where applicable.

Table 4: Secretary of State's conclusions on protected sites for which he can exclude AEol for the Project both alone and in-combination.

Protected Site	Qualifying Feature	Effect pathway (C,O,D) C = construction; O = operations and maintenance; D = decommissioning	Views of IPs and the ExA	Secretary of State's conclusions Alone	Secretary of State's conclusions In-Combination
Flamborough Head SAC	Reefs	Temporary increase in suspended sediment or smothering Spread of INNS through introduction of hard substrate Accidental pollution	No concerns raised during Examination ExA recommended that AEol can be excluded both alone and in-combination.	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEol of the Flamborough Head SAC can be excluded for the Project alone	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEol of the Flamborough Head SAC can be excluded for the Project in combination with other plans or projects
		Changes to physical processes (from impacts on Smithic Bank) Changes to the hydrodynamic regime (from impacts on the Flamborough Front)	See Section 5.4 ExA recommended that AEol can be excluded both alone and in-combination.		
	Submerged or partially submerged sea caves	Temporary increase in suspended sediment or smothering Spread of INNS through introduction of hard substrate Accidental pollution	No concerns raised during Examination ExA recommended that AEol can be excluded both alone and in-combination.		
Humber Estuary SAC	Atlantic salt meadows; <i>Salicornia</i> and other annuals colonising mud and sand	Nitrogen deposition (construction, decommissioning)	No concerns raised during Examination ExA recommended that AEol can be excluded both alone and in-combination.	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEol of the Humber Estuary SAC can be excluded for the Project alone	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEol of the Humber Estuary SAC can be excluded for the Project in combination with other plans or projects
		Changes to physical processes (from impacts on Smithic Bank)	See Section 5.4 ExA recommended that AEol can be excluded both alone and in-combination.		
	Atlantic salt meadows; <i>Salicornia</i> and other annuals colonising mud and sand - as supporting habitat for SPA and Ramsar site features	Nitrogen deposition (construction, decommissioning)	No concerns raised during Examination ExA recommended that AEol can be excluded both alone and in-combination.		
	Sandbanks which are slightly covered by seawater at all times	Changes to physical processes (from impacts on Smithic Bank)	See Section 5.4		

	Mudflats and sandflats not covered by seawater at low tide		ExA recommended that AEoI can be excluded both alone and in-combination.		
	Estuaries				
	Atlantic Salt Meadows; <i>Salicornia</i> and other annuals colonising mud and sand; Sandbanks which are slightly covered by seawater at all times; Mudflats and sandflats not covered by seawater at low tide; and Estuaries - as supporting habitat for SPA and Ramsar site features				
	Grey seal				
	Increase in underwater noise (construction and decommissioning) Vessel disturbance Vessel collision risk		No concerns raised during Examination ExA recommended that AEoI can be excluded both alone and in-combination.		
	Changes to physical processes – effects on supporting habitats		See Section 5.4 ExA recommended that AEoI can be excluded both alone and in-combination.		
	Changes in prey availability and behaviour		NE confirmed [REP8-029] that it considered there to be a pathway for impacts on prey availability from impacts on the Flamborough Front and Smithic Bank. Whilst it did not agree an AEoI could be excluded from this LSE pathway for Southern North Sea SAC, it confirmed that an AEoI could be excluded for grey seal of the Humber Estuary SAC. However, it did not specifically mention grey seal with respect to the Humber Estuary Ramsar site. See Section 5.4 regarding indirect effects on prey availability resulting from impacts on the Flamborough Front or Smithic Bank.		

			ExA recommended that AEoI can be excluded both alone and in-combination.		
Humber Estuary Ramsar	Saltmarsh; Saltmarsh – as supporting habitat for SPA and Ramsar site features	Nitrogen deposition (construction, decommissioning)	No concerns raised during Examination ExA recommended that AEoI can be excluded both alone and in-combination.	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Humber Estuary Ramsar can be excluded for the Project alone	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Humber Estuary Ramsar can be excluded for the Project in combination with other plans or projects
	Impacts on the habitat features listed for the Humber Estuary Ramsar site in the context as supporting habitat for designated ornithological features	Changes to physical processes (from impacts on Smithic Bank)	See Section 5.4 ExA recommended that AEoI can be excluded both alone and in-combination.		
	Grey seal	Increase in underwater noise (construction and decommissioning) Vessel disturbance Vessel collision risk	No concerns raised during Examination ExA recommended that AEoI can be excluded both alone and in-combination.		
		Changes to physical processes – effects on supporting habitats	See Section 5.4 ExA recommended that AEoI can be excluded both alone and in-combination.		
		Changes in prey availability and behaviour	NE confirmed [REP8-029] that it considered there to be a pathway for impacts on prey availability from impacts on the Flamborough Front and Smithic Bank. Whilst it did not agree an AEoI could be excluded from this LSE pathway for Southern North Sea SAC, it confirmed that an AEoI could be excluded for grey seal of the Humber Estuary SAC. However, it did not specifically mention grey seal with respect to the Humber Estuary Ramsar site. See Section 5.4 regarding indirect effects on prey availability resulting from impacts on the Flamborough Front or Smithic Bank. ExA recommended that AEoI can be excluded both alone and in-combination.		
Southern North Sea SAC		Increases in underwater noise	NE [RR-029] and [REP8-029] agreed with the conclusion of no AEoI from the Project alone with respect to mortality	The Secretary of State is satisfied, having had	The Secretary of State is satisfied, having had regard

	Harbour porpoise ⁷⁰		<p>and injury when taking into account the measures in the piling outline MMMP. However, it requested amendments to the draft DCO to ensure that simultaneous and concurrent piling would not occur [RR-029]. It also sought further details on mitigation in the MMMP [RR-029], however, not specifically in the context of protected sites. These matters were resolved by the close of Examination.</p> <p>NE [RR-029] requested that the number of individuals within the area of Permanent Threshold Shift (PTS) from piling noise be presented. Further to the Applicant's presentation of this information [REP1-038], NE advised [REP3-015] that the number of individuals at risk of PTS had increased and the current mitigation would not mitigate the full PTS zone and should be revisited. NE's concerns were resolved [REP8-031] further to the Applicant updating the outline MMMP [REP6-012] to commit to mitigating cumulative PTS impact ranges using the latest research and methods available at the time of the final MMMP.</p> <p>See Section 5.3.1 regarding in-combination impacts.</p> <p>ExA recommended that AEoI can be excluded both alone and in-combination.</p>	<p>regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Southern North Sea SAC can be excluded for the Project alone.</p>	<p>to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Southern North Sea SAC can be excluded for the Project in combination with other plans or projects. Specifically, the Secretary of State has confidence in the SIP process for managing underwater noise impacts of the Southern North Sea SAC.</p>
		<p>Vessel disturbance</p> <p>Vessel collision risk</p> <p>Accidental pollution</p>	<p>No concerns raised during Examination.</p> <p>ExA recommended that AEoI can be excluded both alone and in-combination.</p>		
		<p>Changes in prey availability and behaviour - indirect effects on prey availability (herring) from piling noise (construction)</p>	<p>Herring is a prey species of the harbour porpoise of the Southern North Sea SAC. Discussions relating to the Applicant's proposed seasonal restriction of piling at the offshore HVAC booster stations (Work No. 3) to mitigate effects on the Banks herring spawning ground are detailed in Chapter 9 of the ExA's Recommendation Report. There, the ExA concluded that the piling restriction would mitigate significant effects on herring.</p> <p>See Section 5.4 regarding indirect effects on prey availability resulting from impacts on the Flamborough Front or Smithic Bank.</p>		

⁷⁰ In respect of an increase in suspended sediment and impacts on the harbour porpoise of the Southern North Sea SAC, NE [RR-029] stated that it expected the impact to be considered in the HRA. However, NE did not identify it as an impact pathway in its consideration of AEoI of the site [REP8-029, Appendix 2]. Furthermore, NE did not provide any specific details of its concerns. The ExA considered [ER 13.6.12] that it had not been presented with persuasive evidence that harbour porpoise would be adversely affected by the sediment disposal activities, particularly given its large foraging range.

			ExA recommended that AEol can be excluded both alone and in-combination ⁷¹ .		
		Increases in suspended sediment	Matter not explored at depth during the Examination in relation to the HRA ⁷² . The Applicant [REP5-085] reiterated its position that there would be no LSE. ExA recommended that AEol can be excluded both alone and in-combination.		
Moray Firth SAC	Bottlenose dolphin	Increase in underwater noise (construction and decommissioning) Vessel disturbance Vessel collision risk	No concerns raised during the Examination. NE [RR-029] deferred to NatureScot to comment on the suitability of the assessment of impact to the Moray Firth SAC. The Applicant [REP1-038] and [REP8-011] confirmed that Scottish Natural Heritage (now NatureScot) was issued with the draft HRA Screening Report and the draft RIAA during the pre-application phase and that no comments were received from NatureScot in relation to these communications. ExA recommended that AEol can be excluded both alone and in-combination.	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEol of the Moray Firth SAC can be excluded for the Project alone	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEol of the Southern Moray Firth SAC can be excluded for the Project in combination with other plans or projects
The Wash and North Norfolk Coast SAC	Harbour seal	Increase in underwater noise (construction and decommissioning) Vessel disturbance	No concerns raised during the Examination. NE agreed that an AEol could be excluded for The Wash and North Norfolk Coast SAC [REP8-029]. ExA recommended that AEol can be excluded both alone and in-combination.	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEol of The Wash and North Norfolk Coast SAC can be excluded for the Project alone	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEol of The Wash and North Norfolk Coast SAC can be excluded for the Project in combination with other plans or projects
		Vessel collision risk	NE [RR-029, Appendix D], [AS-029 HRA 1.6] and [REP2-082] raised concerns about collision risk whilst vessels were in transit to or from ports and requested information on likely or confirmed locations of ports for construction and operation, anticipated vessel transit routes, vessel density, seal densities and estimates of number of individuals impacted. The Applicant presented the information requested by NE in [REP4-045] and stated [REP1-038] and [REP3-046] that a vessel management		

⁷¹ The ExA considered [ER 13.6.11] that only a small part of the Banks herring spawning ground would be temporarily affected by piling at the offshore HVAC booster stations (Work No. 3). Furthermore, whilst the final piling restriction proposed by the Applicant did not cover the complete period recommended by the MMO, the ExA considered that any effect would be restricted to a small portion of the spawning period in the shoulder months. Harbour porpoise of the Southern North Sea SAC forage widely on numerous food sources and thus the ExA did not consider that the conservation objective to maintain prey availability would be hindered.

⁷² NE [RR-029] stated that it expected this impact to be considered in the HRA. However, NE did not identify it as an impact pathway in its consideration of AEol of the site [REP8-029, Appendix 2]. Furthermore, NE did not provide any specific details of its concerns. The ExA considered [ER 13.6.12] that it had not been presented with persuasive evidence that harbour porpoise would be adversely affected by the sediment disposal activities, particularly given the species large foraging range.

			<p>plan would determine vessel routing to and from construction areas and ports to minimise encounters with marine mammals as far as reasonably practicable (secured in the draft DCO through Schedule 11, Part 2 - Condition 13(1)(d)(v) and Schedule 12, Part 2 – Condition 13(1)(d)(v)). This provided the assurance to NE that there would be no AEoI as a result of impacts on marine mammal qualifying features from transiting vessels [REP7-068] and [REP8-029].</p> <p>ExA recommended that AEoI can be excluded both alone and in-combination.</p>		
Berwickshire and North Northumberland Coast SAC	Grey seal	<p>Increase in underwater noise (construction and decommissioning)</p> <p>Vessel disturbance</p> <p>Vessel collision risk</p>	<p>No concerns raised during Examination.</p> <p>NE agreed that an AEoI could be excluded for Berwickshire and North Northumberland Coast SAC [REP8-029].</p> <p>ExA recommended that AEoI can be excluded both alone and in-combination.</p>	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of Berwickshire and North Northumberland Coast SAC can be excluded for the Project alone	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of Berwickshire and North Northumberland Coast SAC can be excluded for the Project in combination with other plans or projects
Greater Wash SPA	See Section 5.8				
Flamborough and Filey Coast SPA	See Section 5.7				
Humber Estuary SPA and Ramsar	<p>Shelduck;</p> <p>Hen harrier;</p> <p>Avocet;</p> <p>Golden plover;</p> <p>Knot;</p> <p>Dunlin;</p> <p>Ruff;</p> <p>Black-tailed godwit;</p> <p>Bar-tailed godwit;</p> <p>Redshank;</p>	Collision risk (operation and maintenance)	<p>No concerns raised during Examination</p> <p>ExA recommended that AEoI can be excluded both alone and in-combination.</p>	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Humber Estuary SPA and Ramsar can be excluded for the Project alone	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Humber Estuary SPA and Ramsar can be excluded for the Project in combination with other plans or projects

	Waterbird assemblage.				
	All qualifying features	Physical processes – impacts on supporting habitat due to impacts on Smithic Bank	See Section 5.4. ExA recommended that AEoI can be excluded both alone and in-combination.		
Hornsea Mere SPA	Gadwall	Collision risk (operation and maintenance)	No concerns raised during Examination. ExA recommended that AEoI can be excluded both alone and in-combination.	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Hornsea Mere SPA can be excluded for the Project alone	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Hornsea Mere SPA can be excluded for the Project in combination with other plans or projects
Northumbria Coast SPA	Arctic tern	Collision risk (operation and maintenance)	No concerns raised during Examination. ExA recommended that AEoI can be excluded both alone and in-combination.	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Northumbria Coast SPA be excluded for the Project alone	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Northumbria Coast SPA can be excluded for the Project in combination with other plans or projects
Teesmouth and Cleveland Coast SPA	Common tern; Sandwich tern.	Collision risk (operation and maintenance)	No concerns raised during Examination. ExA recommended that AEoI can be excluded both alone and in-combination.	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Teesmouth and Cleveland Coast SPA can be excluded for the Project alone	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Teesmouth and Cleveland Coast SPA can be excluded for the Project in combination with other plans or projects

Coquet Island SPA	Sandwich tern; Common tern; Arctic tern; Roseate tern; Kittiwake (unnamed component of seabird assemblage).	Collision risk (operation and maintenance)	No concerns raised during Examination NE confirmed that AEoI of the Coquet Island SPA from the Project alone could be ruled out. ExA recommended that AEoI can be excluded both alone and in-combination.	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Coquet Island SPA can be excluded for the Project alone	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Coquet Island SPA can be excluded for the Project in combination with other plans or projects
	Puffin (component of seabird assemblage).	Disturbance and displacement			
Farne Islands SPA	Sandwich tern; Arctic tern; Common tern; Kittiwake (component of seabird assemblage).	Collision risk (operation and maintenance)	No concerns raised during the Examination. NE confirmed [REP7-071] and [REP8-029] that an AEoI of the Farne Islands SPA from the Project alone could be ruled out. ExA recommended that AEoI can be excluded both alone and in-combination.	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Farne Islands SPA can be excluded for the Project alone	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Farne Islands SPA can be excluded for the Project in combination with other plans or projects
	Guillemot; Puffin (component of seabird assemblage); Razorbill (unnamed component of seabird assemblage).	Disturbance and displacement			
Northumberland Marine SPA	Common tern; Arctic tern; Roseate tern; Sandwich tern; Kittiwake (unnamed component of seabird assemblage).	Collision (operation and maintenance)	No concerns raised during Examination. ExA recommended that AEoI can be excluded both alone and in-combination.	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Northumberland Marine SPA can be excluded for the Project alone	The Secretary of State is satisfied, having had regard to the Applicants case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the Northumberland Marine SPA can be excluded for the Project in combination with other plans or projects
	Guillemot; Puffin.	Disturbance and displacement			
St Abb's Head and Fast Castle SPA; Forth Islands SPA;	Relevant ornithological features screened in [APP-	Collision risk (operation and maintenance)	No concerns raised during the Examination. The Applicant [REP1-038] and [REP8-011] confirmed that Scottish Natural Heritage (now NatureScot) was issued	The Secretary of State is satisfied, having had regard to the Applicants	The Secretary of State is satisfied, having had regard to the Applicants case and

<p>Outer Firth of Forth and St Andrew's Complex pSPA; Fowlsheugh SPA; Buchan Ness to Collieston Coast SPA; Troup, Pennan and Lion's Heads SPA; East Caithness Cliffs SPA; North Caithness Cliffs SPA; Copinsay SPA; Hoy SPA; Marwick Head SPA; Rousay SPA; Calf of Eday SPA; West Westray SPA; Fair Isle SPA; Sumburgh Head SPA; Noss SPA; Foula SPA; Fetlar SPA; Hermaness, Saxa Vord and Valla Field SPA</p>	<p>167, amended by AS-014] and [REP5-012]</p>	<p>Disturbance and displacement (operation and maintenance)</p>	<p>with the draft HRA Screening Report and the draft RIAA during the pre-application phase and that no comments were received.</p> <p>ExA recommended that AEoI can be excluded both alone and in-combination.</p>	<p>case and mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the relevant Scottish SPAs screened in, can be excluded for the Project alone</p>	<p>mitigation measures secured in the DCO, the views of all IPs and the recommendation of the ExA, that an AEoI of the relevant Scottish SPAs screened in, can be excluded for the Project in combination with other plans or projects</p>
--	---	---	--	---	--

5.7 Flamborough and Filey Coast SPA

The Flamborough and Filey Coast SPA covers 8,040 ha of the North Yorkshire coast, including approximately 7,472 ha of marine habitats. It is located approximately 63km from the array area and 2.5km from the offshore ECC.

Flamborough and Filey Coast qualifies as an SPA by supporting over 1% of the biogeographical populations of four regularly occurring migratory species: kittiwake (estimated breeding population of 44,520 pairs), gannet (8,469 pairs), guillemot (41,607 pairs) and razorbill (10,570 pairs). It also qualifies for its breeding seabird assemblage (c.216,730 individuals), which is of European importance. The breeding seabird assemblage comprises herring gull, fulmar, shag, cormorant, and puffin, as well as the gannet, kittiwake, guillemot, and razorbill populations detailed above.

In addition to the generic conservation objectives for SPAs presented in Section 1.3, NE has provided supplementary conservation objectives for the individual qualifying features of the site, which include:

- restoring the size of the kittiwake breeding population to above 83,700 pairs, whilst avoiding deterioration from the current level indicated by the latest mean peak count or equivalent;
- maintaining the size of the gannet breeding population to above 8,469 pairs, whilst avoiding deterioration from the current level indicated by the latest mean peak count or equivalent;
- maintaining the size of the razorbill breeding population above 10,570 pairs, whilst avoiding deterioration from the current level indicated by the latest mean peak count or equivalent;
- maintaining the size of the guillemot breeding population to above 41,607 pairs whilst, avoiding deterioration from the current level indicated by the latest mean peak count or equivalent;
- maintaining the overall abundance of the seabird assemblage above 216,730 individuals, whilst avoiding deterioration from the current level indicated by the latest mean peak count or equivalent; and
- maintaining the diversity of the seabird assemblage: the total number of species should not be reduced.

No works for the Project will take place within the SPA; however, due to the location of the Project, birds from the SPA may forage within the Project site and other OWFs. These birds may be impacted by collision, disturbance, and displacement.

The Secretary of State has considered the potential for the Project to constitute an AEoI from the Project alone and in combination with other projects for each feature for which a significant effect is likely.

5.7.1 Kittiwake: Alone

A LSE was identified for the kittiwake feature from collision mortality alone and in-combination with other plans or projects, during the operational phase of the Project.

The Applicant estimated the annual collision related mortality for the Project alone to be 23.3 (13.7-39.4) [REP6-28] birds per annum, using its preferred parameters. This would increase the

baseline mortality rate by up to 0.15% (0.09-0.26%), based on a population of 103,070 and a baseline mortality rate of 15,048.

NE calculated that the annual collision mortality rate would be 71 (22-152) which represented an increase in the background mortality rate of 0.47% (0.14-1.02%) [REP6-28]. NE concluded that an AEol of kittiwake from the Project alone could be excluded [REP7-104, Table 2].

The RSPB calculated that the annual collision mortality rate would be 71.4, and that the Flamborough and Filey Coast SPA kittiwake population would be 3.0% lower after the lifetime of the Project. The RSPB concluded that, due to the conservation objective to restore the kittiwake population, and the vulnerability of the population both locally and in the wider biogeographic region, it was not possible to exclude an AEol of the Flamborough and Filey Coast SPA kittiwake population for the Project alone [REP7-098].

5.7.1.1 ExA conclusion

The ExA, in accordance with the advice of NE, concluded that an AEol from the Project alone could be excluded.

5.7.2 Kittiwake: In-Combination

The Applicant calculated that annual kittiwake mortalities for consented projects and future projects (up to Tier 4) would be 364.3 [REP6-028, Table 118] and concluded that the potential for AEol in combination with other plans or projects could not be excluded [REP7-085, Table 11].

NE predicted that annual kittiwake mortalities would be 393; however, this calculation assumed that all consented and future projects from the Hornsea Three Offshore Wind Farm onwards would compensate in full for their impacts. NE concluded that because the kittiwake feature has a 'restore' conservation objective requiring the population to be returned to previous levels, and the predicted level of mortality would mean the population could decline from current levels it could not exclude an AEol of kittiwake from collision mortality in combination with other plans and projects. This conclusion was irrespective of whether fully compensated projects were included on the in-combination total, as the level at which predicted impacts resulted in an AEol had already been reached.

The RSPB [REP2-089 and REP2-090] in contrast, considered that due to uncertainty around the effectiveness of the compensatory measures of the in-combination projects, their effects could not be discounted. The RSPB calculated [REP7-098] that the in-combination annual mortality of kittiwake would be 412.4 individuals. It concluded that the Flamborough and Filey Coast SPA population would be 16.4% lower after the lifetime of the Project, and an AEol could not be excluded for the Project in combination with other plans or projects.

5.7.2.1 ExA conclusion

The ExA agreed that it is not possible to exclude an AEol from in-combination kittiwake collision mortality, noting that the Secretary of State has drawn this conclusion for offshore wind farm projects from Hornsea Three onwards.

5.7.3 Additional information

On 16th December 2022, the Secretary of State wrote to the Applicant to request an updated in-combination collision risk model and population viability analysis (PVA) that included the most recent kittiwake collision mortality estimates for the Sheringham and Dudgeon Extension OWF projects; and all consented projects, including those where compensation measures had been agreed.

On 13th January 2023, the Applicant, in response to the Secretary of State's request for further information, calculated that the total in-combination loss of kittiwake from collision impacts from all projects was 513.8 birds per year.

On 9th February 2023, the Secretary of State wrote to NE to ask them to review the Applicant's updated assessment of the in-combination mortalities of kittiwake.

On 9th March 2023, in response to the Secretary of State's request, NE confirmed that the updated assessments were sufficient to assess the in combination impacts on ornithology receptors: however, since the end of the Examination, NE had issued new interim guidance on avoidance rates for use in collision risk modelling, which if applied to the Project, may decrease the Project's predicted impacts on kittiwake. NE confirmed that this would not affect their conclusions regarding adverse effects, but could affect the level of compensation required for the Project's impacts.

On the 20th March 2023, the Secretary of State wrote to the Applicant to request updated mortality assessments using NE's interim avoidance rates in the collision risk models for the Project alone; and to confirm the updated in combination totals and any changes to the counterfactual growth rate (CFGR) and counterfactual population size (CFPS) figures for this species.

On the 17th April 2023, the Applicant confirmed that it had updated its collision risk models for kittiwake using NE's interim avoidance rates and that the predicted mortality had reduced to 15.7 birds per year. Furthermore, the Applicant also stated that NE's predicted mortality would be reduced to 43.1 birds per year using the interim rates.

On the 5th April 2023, the Secretary of State wrote to the Applicant to confirm whether any of the reductions in array area resulting from the adoption of protective provisions, or any other changes to the development layout or footprint, would affect the conclusions in its HRA; and to present updated mortality assessments for kittiwake for the alternative scenarios. He specified that all assessments should use NE's advised parameters, including the collision risk model interim avoidance rates; and provide an updated in-combination assessment.

On the 16th May 2023, the Applicant responded to the Secretary of State's request, stating that they had reviewed the thirteen potential protective provision scenarios and had undertaken revised mortality assessments where there would be a discernible change.

On the 18th June 2023, The Applicant confirmed that a commercial agreement had been signed between bp (on behalf of NEP) and the Applicant, and that there were no longer any requirements for protective provisions under the Hornsea Four DCO for bp or any other party involved in the NEP Project. The protective provisions for other scenarios were not considered to have a discernible impact on bird mortalities.

5.7.3.1 The Secretary of State's conclusion

The Secretary of State has considered the information provided by the ExA and the additional information presented post-examination, and concludes that collision mortalities would not undermine the conservation objective to restore the size of the kittiwake population of the SPA for the Project alone, but an adverse effect in combination with other projects could not be excluded. The Secretary of State therefore concludes that an AEoI of the Flamborough and Filey Coast SPA from the effects of collision mortality on kittiwake from the in-combination with other projects, cannot be excluded.

5.7.4 Gannet: Alone

LSEs were identified for gannet from disturbance and displacement during all phases of the Project; and from collision risk during the operational phase of the Project.

The Applicant calculated that gannet mortality from displacement and disturbance would be 2.0 to 2.6 birds per year during construction, and 4.0 to 5.3 birds per year during operation [REP6-028, Tables 67 and 68] and [REP7-085, Tables 67 and 68], based on displacement and mortality rates of 30-40% and 1% for the construction phase; and 60-80% and 1% for the operation phase. This would represent a <0.39% increase in the baseline mortality rate.

The Applicant estimated the annual collision related mortality for the Project to be 7.1 (4.2-13.4) [REP6-028 and REP7-085] birds per year, using its preferred parameters. This would increase the baseline mortality rate by 0.51% (0.31-0.97%), based on a population of 16,938 and a baseline mortality rate of 1,372.

The Applicant [REP5-078] and [REP6-026] explained it had assessed collision risk and disturbance and displacement impacts both separately and combined. However, it explained that NE was producing new guidance on revised macro avoidance rates which prevent the double counting of birds that are at risk of both collision and displacement. The Applicant presented a revised assessment in its Ornithology EIA and HRA Annex [REP5-078], updated as [REP5a-011] and subsequently [REP6-028], presenting a reduction of 60%, 65%, 70%, 75% and 80% to monthly density estimates used in the collision risk assessment; this resulted in a significant reduction in predicted impacts on gannet.

The Applicant concluded that the annual mortality of gannet from the Project would be 2.1 birds once the macro avoidance rate of 70% was included in the assessment. This would represent a <0.15% increase in the background mortality rate.

NE calculated that the annual mortality of gannets from displacement and collision combined would be between 6 and 93 birds, which would equate to an increase in the background mortality rate of 0.02-0.44%. NE concluded that there would be no AEoI due to combined gannet collision and displacement impacts because the colony would be able to increase from its current size of 24,594 adults for a growth rate of greater than or equal to 1%.

The RPSB calculated that the annual mortality of gannets from displacement and collision combined would be between 33 and 46.3 birds. Whilst the RSPB calculated a lower number of annual mortalities than NE, it disagreed that an AEoI could be excluded on the basis that the current outbreak of Highly Pathogenic Avian Influenza ("HPAI") created considerable uncertainty as to the future viability of this population.

5.7.4.1 ExA conclusion

The ExA acknowledged RSPB's concerns around HPAI, but stated that the impacts of HPAI on the long-term viability of the gannet population were not known and did not consider it appropriate to take this into account. The ExA concluded that an AEoI from the combined collision and displacement impacts on gannet from the Project alone could be excluded.

5.7.5 Gannet: In-Combination

The Applicant's Ornithology EIA and HRA Annex [REP6-028] did not present predicted annual mortality for gannet that took into account the macro avoidance rate of 70% for in-combination effects. However, NE confirmed that it would take the correction factor into account when forming its own conclusions [REP8-031].

NE calculated that annual gannet mortalities for consented projects and projects in examination (up to Tier 4) would be between 156 and 836 (assuming a macro avoidance rate of 70%). This would result in a reduction in the population growth rate of 0.66 to 3.53% per year. NE considered that the impacts would be at the lower end of this range, with a rate for displacement of 80% and of 2% for mortality. This would allow the colony to be maintained at, or increase, from its current size of 24,594 adults for a growth rate of less than or equal to 1%.

NE concluded [REP7-104] it could rule out adverse displacement and collision risk effects on gannet from the Flamborough and Filey Coast SPA when combined with other consented plans and projects (up to Tier 3). However, it was unable to rule out an AEoI when considering the effects in combination with the Sheringham and Dudgeon Extension Projects and the Rampion 2 Offshore Wind Farm due to the lack of detailed information about those projects.

The RSPB calculated that annual gannet mortalities for consented projects and future projects in examination (up to Tier 4) would be between 527.5 and 664.6 birds. The RSPB could not rule out an AEoI from combined gannet displacement and collision from the Project alone [REP7-098] because it did not accept the use of a macro avoidance factor and concluded that the Flamborough and Filey Coast SPA population was likely to be 62.0% to 69.6% lower after the lifetime of the Project, in combination with other developments.

5.7.5.1 ExA conclusions

On the basis of the information available to it, and noting that NE calculated the same reduction in population growth rates with or without the future projects, the ExA concluded [ER 13.7.156] that an AEoI can be excluded as a result of combined collision and displacement impacts on gannet from the Project in combination with other plans or projects.

5.7.6 Additional information

On 16th December 2022, the Secretary of State wrote to the Applicant to request updated in-combination collision risk and displacement models, and PVA that included the most recent gannet mortality estimates for the Sheringham and Dudgeon Extension OWF projects, and all consented projects.

On 13th January 2023, the Applicant, in response to the Secretary of State's request for further information, provided updated calculations for collision and displacement impacts from all projects using a range of parameters.

On 9th February 2023, the Secretary of State wrote to NE to ask them to review the Applicants updated assessments of in combination gannet mortality.

On 9th March 2023, in response to the Secretary of State's request, NE confirmed that the updated assessments were sufficient to assess the in-combination impacts on gannet and an adverse effect on gannet from the Project alone and in combination with other projects could be excluded: however, since the end of the Examination, NE had issued new interim guidance on avoidance rates for use in collision risk modelling, which if applied to the Project, may decrease the Project's predicted impacts on gannet.

On the 20th March 2023, the Secretary of State wrote to the Applicant to request revised mortality estimates by applying NE's interim avoidance rates to the collision risk models for the Project alone; and to confirm the updated in combination totals and any changes to the counterfactual growth rate (CFGR) and counterfactual population size (CFPS) figures for gannet.

On the 17th April 2023, the Applicant confirmed that they had updated their collision risk models for gannet using NE's interim avoidance rates and that the predicted mortality had reduced to 5.5 birds per year. Furthermore, the Applicant also stated that NE's predicted mortality would be reduced to 9.1 birds per year using the interim rates.

On the 5th April 2023, the Secretary of State wrote to the Applicant to confirm whether any of the reductions in array area resulting from the adoption of protective provisions, or any other changes to the development layout or footprint, would affect the conclusions in its HRA; and to present updated mortality assessments for the alternative scenarios. He specified that all assessments should use NE's advised parameters, including the collision risk model interim avoidance rates; and provide an updated in-combination assessment.

On the 16th May 2023, the Applicant responded to the Secretary of State's request, stating that it had reviewed the thirteen potential protective provision scenarios and undertaken revised mortality assessments where there would be a discernible change.

On the 18th June 2023, The Applicant confirmed that a commercial agreement had been signed between bp (on behalf of NEP) and the Applicant, and that there were no longer any requirements for protective provisions under the Hornsea Four DCO for bp or any other party involved in the NEP Project. The protective provisions for other scenarios were not considered to have a discernible impact on bird mortalities.

5.7.6.1 The Secretary of State's conclusion

The Secretary of State has considered the information provided by the ExA and the additional information presented post-Examination and concludes that mortalities from collision and displacement will not undermine the conservation objective to maintain the size of the gannet population of the SPA. The Secretary of State therefore concludes that an AEoI of the Flamborough and Filey Coast SPA from the effects of displacement and collision mortality on gannet from the Project alone and in combination with other projects can be excluded.

5.7.7 Guillemot: Alone

LSEs were identified for guillemot from displacement and disturbance during all phases of the Project; and from barrier effects and impacts on supporting habitats during the operational phase.

5.7.7.1 Displacement and disturbance effects

The Applicant calculated that the annual guillemot mortalities from displacement and disturbance would be 39.5 based on displacement and mortality rates of 50% and 1%, or 111 based on displacement and mortality rates of 70% and 2% [REP8-017, Table 3]. The latter would represent a <0.09% reduction in the population growth rate per year [REP6-027, Table 44]. The Applicant concluded that as the predicted reduction in population growth rate was less than 0.5% per year [REP6-026, Table 44] there would be no AEol on the population.

The Applicant provided a displacement matrix [REP8-017, Table 4] for its preferred parameters and NE's parameters with standard SNCB apportioning. It maintained that, should the Secretary of State rely on the parameters previously adopted for other decisions (i.e., 70% displacement and 2% mortality) there would still be no AEol as the reduction in population growth would be below 0.5%.

NE calculated that the annual mortality of guillemots would be between 33 and 771 using the standard SNCB approach and between 97 and 2,262 using its bespoke approach [REP7-104]. These losses would reduce the population growth rate by 0.03-0.69% and 0.09-2.07%, respectively.

NE noted that a reduction in population growth rate of greater than 0.5% per annum is reached at mortality rates of 2% for its preferred bespoke approach and at 5% for the standard SNCB approach to apportioning.

NE considered a realistic mortality rate of 5% for a displacement rate of 70% would reflect the heightened sensitivity of the area. This would result in a Project alone impact of 1,131 adults per annum, which would lead to a population decline at a growth rate of 1% per annum, but a population increase at a growth rate of greater than 2%.

NE stated that the current long-term annual growth rate is around 3.2% (1987-2017), with the most recent growth rate suggesting some improvement (3.9% between 2008-2017). However, it noted that productivity has been declining, indicating that population increase may be driven, at least in part, by immigration. It confirmed the conservation objective is to maintain the size of the breeding population, whilst avoiding deterioration from its current level.

NE advised that other factors and sources of uncertainty should be considered when considering whether the Project would lead to AEol due to impacts on the guillemot breeding feature, namely:

- the importance of the area as key supporting habitat during the chick rearing moult period;
- the influence of other nearby consented projects on the importance and use of the area;
- uncertainty surrounding how birds will respond to the Project;
- the influence of indirect effects on prey resources during the chick rearing moult period;
- climate change; and
- HPAI.

The Applicant responded to these matters [REP8-017, Table 11], stating that they had been accounted for, or simply did not apply.

NE [REP7-104] did not consider that the Flamborough and Filey Coast SPA annual guillemot growth rate would be sustained over the next 35 years at a level which would prevent the colony from being susceptible to the displacement impacts of the Project. This was a result of the sources of uncertainties, consideration of the colony's current and likely future growth rates (including evidence of declines in productivity at the colony), and the potential functional importance of the array area. Accordingly, it could not rule out beyond reasonable scientific doubt that, given the predicted impacts associated with the Project, the conservation objectives for the feature would be met.

The RSPB [REP6-068] calculated a 'probable' annual mortality of between 450.3 and 694.1 individuals. It concluded that the additional mortality predicted to arise through displacement would result in the population of guillemot being 13.9% to 20.6% lower after the lifetime of the Project than it would be without it. It could therefore not exclude an AEol.

Barrier effects

The Applicant amended its assessment of impacts on guillemot in a revised version of the Offshore Ornithology Displacement Analysis [REP2-003]. The Applicant concluded that due to the distance between the Project array area and the SPA (65km at its closest point) being at the outer limits of the known mean max foraging range for guillemot (73.2km) (Woodward et al. 2019), the array would not cause a barrier effect on a regular basis, as those foraging ranges indicate that breeding auks would predominantly forage in the waters to the west of the array area. Furthermore, models based on tracking studies indicate that guillemots are likely to forage in the waters to the east of the Project array area (Wakefield et al. 2017). Based on the above evidence Therefore, due to the distance of the array area from the FFC SPA barrier effects have been screened out [APP-017].

Impacts on supporting habitats

The Applicant [REP1-038], [REP5-085], [REP5a-018] and [REP8-017] considered the array area to be significantly outside the key foraging area for guillemot from the Flamborough and Filey Coast SPA. However, NE [REP7-104] considered the Project to have the potential to exclude significant numbers of birds from the array area. It noted that the importance of the area during August and September was a critical time for flightless birds and attendant chicks. It raised concerns that displaced birds would be forced to compete with others in more important adjacent sea areas.

5.7.7.2 ExA conclusion

The ExA agreed that NE's bespoke assessment approach should be used but considered it appropriate to apply a 70% displacement rate and a 2% mortality rate. NE's calculations at those rates [REP7-104, Table B6] predict 452.3 annual mortalities and a reduction in population growth rate of 0.46% per annum.

NE stated that the current long-term annual growth rate is approximately 3.2%, with the most recent growth figures suggesting some improvement. However, it noted that productivity has been declining, indicating that the population increase may be driven by immigration. The ExA

acknowledges that there is no guarantee that the population growth rate would be maintained over the next 35 years and that the implications of HPAI are not yet known. However, on the basis that the reduction in population growth rate would be less than 0.5% per annum, the ExA is content that an AEol can be excluded as a result of displacement impacts on guillemot from the Project alone.

5.7.8 Guillemot: In-Combination

5.7.8.1 Displacement and disturbance effects

The Applicant calculated that annual guillemot mortalities for consented projects and future projects in examination (Tier 4) would be between 460, based on a 70% displacement rate and 2% mortality rate. This would reduce the population growth rate by 0.41%. On the basis that the predicted reduction in growth rate would be less than 0.5% per annum, the Applicant concluded there would be no AEol [REP8-017].

NE set out predicted impacts and associated percentage reductions in guillemot population growth rates for different displacement and mortality rates [REP7-104, Table B6]. It assumed an in-combination estimate of 1,600 adult mortalities per annum, based on a 70% displacement and 5% mortality rate for the Project, and 70% displacement and 2% mortality rate for in-combination projects (assuming the majority of them occupy less important sea areas). NE could not exclude an AEol for an annual guillemot collision mortality rate of 1,131 from the Project alone, therefore the same conclusion applied for in-combination effects.

The RSPB calculated that the in-combination impacts would result in an annual mortality of between 824.5 to 1,625.4 guillemots per year. The RSPB [REP6-068] concluded that, in combination with other developments, the population of guillemot would be 24.0% to 41.7% lower after the lifetime of the Project than it would be without it. Consequently, the RSPB could not rule out in-combination AEol due to impacts on the guillemot qualifying feature.

5.7.8.2 ExA conclusion

The ExA considered it appropriate to apply NE's bespoke assessment to the definition of bio-seasons, whilst applying a displacement rate of 70% and a mortality rate of 2%. NE's calculations [REP7-104, Table B6] predict 921 annual mortalities and a reduction in population growth rate of 0.92% per annum for the Project in combination with consented projects. When the Sheringham and Dudgeon Extension and Rampion 2 Offshore Wind Farms are also included, the prediction is 934.4 annual mortalities and a reduction in population growth rate of 0.92% per annum. As the reduction in population growth rate is greater than 0.5%, the ExA concludes that an AEol cannot be excluded as a result of displacement impacts on guillemot from the Project in combination with other plans or projects.

5.7.9 Additional information

On 16th December 2022, the Secretary of State wrote to the Applicant to request an updated in-combination displacement assessment and PVA that included the most recent guillemot mortality estimates for the Sheringham and Dudgeon Extension OWF projects, and all consented projects.

On 13th January 2023, the Applicant, in response to the Secretary of State's request for further information, calculated that the total in-combination loss of guillemot from displacement impacts from all projects was 802 birds per year using NE's approach and displacement and mortality rates 70% of 2%.

On 9th February 2023, the Secretary of State wrote to NE to ask them to review the Applicants updated assessments of in-combination guillemot mortality.

On 9th March 2023, in response to the Secretary of State's request, NE confirmed that the updated assessments were sufficient to assess the in combination impacts on ornithology receptors: however, the results of these assessment did not change their conclusions regarding adverse effects.

On the 5th April 2023, the Secretary of State wrote to the Applicant to confirm whether any of the reductions in array area resulting from the adoption of protective provisions, or any other changes to the development layout or footprint, would affect the conclusions in its HRA; and to present updated mortality assessments for guillemot for the alternative scenarios using NE's approach to displacement; and provide an updated in-combination assessment.

On the 16th May 2023, the Applicant responded to the Secretary of State's request, stating that it had reviewed the thirteen potential protective provision scenarios and undertaken revised mortality assessments where there would be a discernible change.

The Applicant stated that for all protective provision scenarios modelled the displacement effects would decrease when compared to the impacts predicted at the end of the Examination. The Applicant maintained their position that an AEoI could be excluded for displacement impacts on the guillemot feature of the SPA from the Project alone or in-combination with other projects.

On the 18th June 2023, The Applicant confirmed that a commercial agreement had been signed between bp (on behalf of NEP) and the Applicant, and that there were no longer any requirements for protective provisions under the Hornsea Four DCO for bp or any other party involved in the NEP Project. The protective provisions for other scenarios were not considered to have a discernible impact on bird mortalities.

5.7.9.1 The Secretary of State's conclusion

The Secretary of State concludes that collision and displacement mortalities would not undermine the conservation objectives for the guillemot feature of the Flamborough and Filey Coast SPA and an AEoI from the Project alone can be excluded.

The Secretary of State agrees with the ExA that in-combination displacement mortalities could undermine the conservation objective to maintain the size of the SPA population. The Secretary of State therefore concludes that an AEoI of the Flamborough and Filey Coast SPA from the effects of collision mortality on guillemot from the Project in combination with other plans and projects cannot be excluded.

5.7.10 Razorbill: Alone

LSEs were identified for razorbill from displacement and disturbance during all phases of the Project; and from barrier effects and impacts on supporting habitats during the operational phase.

Displacement and disturbance effects

The Applicant calculated that the annual razorbill mortalities from displacement and disturbance would be 5 based on displacement and mortality rates 70% and 2% [REP8-017]. This would represent a <0.01% reduction in the population growth rate per year [REP8-017]. The Applicant concluded that as the predicted reduction in population growth rate was less than 0.5% per year [REP6-026, Table 44] there would be no AEol of the population.

NE [REP7-104] stated there was the potential to exceed a 1% increase in the baseline mortality (Tables B2 and B7) with the range of predicted impacts using the bespoke approach, but not the SNCB standard approach. It noted that the Flamborough and Filey Coast SPA razorbill colony has exhibited strong growth in recent years and that it is currently very productive. It confirmed the conservation objective is to maintain the size of the breeding population, whilst avoiding deterioration from its current level. It considered that using both approaches, the colony would be predicted to continue to increase from its current size of 40,506 adults for a growth rate scenario of greater than 1% per annum.

NE concluded that the Flamborough and Filey Coast SPA razorbill colony was sufficiently robust to maintain the population at its current level and sustain additional mortalities from the impacts of the Project alone and an AEol due to impacts on the razorbill feature could be excluded.

The RSPB [REP6-068] calculated a 'probable' annual mortality of between 24.2 and 63.3 individuals. It concluded that the additional mortality predicted to arise through displacement would result in the population of razorbill being 2.5% to 6.4% lower after the lifetime of the Project than it would be without it. It did not identify an AEol due to impacts on razorbill as a result of the Project alone.

Barrier effects

The Applicant amended its assessment of impacts on auks in a revised version of the Offshore Ornithology Displacement Analysis [REP2-003]. The Applicant concluded that due to the distance between the Project array area and the FFC SPA (65 km at its closest point) being at the outer limits of the known mean max foraging range for razorbill (88.7 km) (Woodward et al. 2019), the array would not cause a barrier effect on a regular basis, as the foraging ranges indicate that breeding razorbill would predominantly forage in the waters to the west of the Hornsea Four array area. Furthermore, models based on tracking studies indicate that razorbills are likely to forage in the waters to the east of the Project array area (Wakefield et al. 2017) Therefore, due to the distance of the Hornsea Four array area from the FFC SPA barrier effects have been screened out [APP-017].

Impacts on supporting habitats

The Applicant [REP1-038], [REP5-085], [REP5a-018] and [REP8-017] considered the array area to be significantly outside the key foraging area for razorbill from the Flamborough and Filey Coast SPA. However, NE [REP7-104] considered the Project to have the potential to exclude significant numbers of birds from the array area. It noted that the importance of the area during August and September was a critical time for flightless birds and attendant chicks. It raised concerns that displaced birds would be forced to compete with others in more important adjacent sea areas.

5.7.10.1 ExA conclusion

The ExA noted NE's [REP7-104] agreement that there would be no AEoI due to displacement of razorbill from the Project alone based on its own preferred parameters, which the Applicant asserts are overly precautionary. As such, the ExA sees no reason to disagree with these conclusions. It notes from NE's End of Examination Position on Offshore Ornithology [REP7-104, Table B8] that applying NE's preferred approach and a 70% displacement and 2% mortality rate would result in 45.6 razorbill mortalities per year (representing a 0.15% reduction in the population growth rate).

5.7.11 Razorbill: In-Combination

The Applicant calculated that annual razorbill mortalities for consented projects and future projects in examination (Tier 4) would be 93, based on a 70% displacement rate and 2% mortality rate. This would reduce the population growth rate by 0.29%. On the basis that predicted reduction in growth rate would be less than 0.5% per annum, the Applicant concluded there would be no AEoI [REP8-017].

NE presented its predicted impacts and associated percentage reductions in razorbill population growth rates for different displacement and mortality rates [REP7-104, Table B6]. It assumed an in-combination total of 208 adult mortalities per year, based on a 70% displacement and 5% mortality rate for the Project, and 70% displacement and 2% mortality rate for in-combination projects (assuming the majority of them occupy less important sea areas). It predicted the colony would continue to increase for growth rate scenarios greater than 1%.

NE considered it unlikely that the growth rate (currently 4.4% per annum) would fall to much below 1% - 2% per annum. However, other factors and sources of uncertainty should be considered when considering whether the Project would lead to AEoI due to impacts on razorbill, namely:

- the importance of the area as key supporting habitat during the chick rearing moult period;
- the influence of other nearby consented projects on the importance and use of the area;
- uncertainty surrounding how birds will respond to the Project;
- the influence of indirect effects on prey resources during the chick rearing moult period;
- climate change; and
- HPAI.

For these reasons, NE was unable to exclude an AEoI of the razorbill feature of the SPA from the Project, in combination with other projects.

The RSPB concluded that the population of razorbill would be 11.1% to 21.9% lower after the lifetime of the Project than it would be without it and an AEoI could not be excluded.

5.7.11.1 The ExA conclusion

The ExA considered it appropriate to apply NE's bespoke assessment to the definition of bio-seasons, applying a displacement rate of 70% and a mortality rate of 2%. NE's calculations [REP7-104, Table B8] predicted 142.7 annual mortalities and a reduction in population growth rate of 0.44% per annum for the Project in combination with consented projects (including the Sheringham and Dudgeon Extension and Rampion 2 Offshore Wind Farms). On the basis that

the reduction in population growth rate is less than 0.5% per annum, the ExA is content that an AEoI can be excluded as a result of displacement impacts on razorbill from the Project in combination with other projects.

5.7.12 Additional information

On 16th December 2022, the Secretary of State wrote to the Applicant to request an updated in-combination displacement assessment and PVA that included the most recent razorbill mortality estimates for the Sheringham and Dudgeon Extension OWF projects, and all consented projects.

On 13th January 2023, the Applicant, in response to the Secretary of State's request for further information, calculated that the total in-combination loss of razorbill from displacement impacts from all projects was 95 birds per year using NE's approach and displacement and mortality rates 70% of 2%.

On 9th February 2023, the Secretary of State wrote to NE to ask them to review the Applicants updated assessments of in-combination razorbill mortality.

On 9th March 2023, in response to the Secretary of State's request, NE confirmed that the updated assessments were sufficient to assess the in combination impacts on ornithology receptors: however, the results of these assessment did not change their conclusions regarding adverse effects.

On the 5th April 2023, the Secretary of State wrote to the Applicant to confirm whether any of the reductions in array area resulting from the adoption of protective provisions, or any other changes to the development layout or footprint, would affect the conclusions in its Habitats Regulations Assessment; and to present updated mortality assessments for guillemot for the alternative scenarios using NE's approach to displacement; and provide an updated in-combination assessment.

On the 16th May 2023, the Applicant responded to the Secretary of State's request, stating that it had reviewed the thirteen potential protective provision scenarios and undertaken revised mortality assessments whether there would be a discernible change.

The Applicant stated that for all protective provision scenarios modelled the displacement effects would decrease when compared to the impacts predicted at the end of the Examination. The Applicant maintained their position that an AEoI could be excluded for displacement impacts on the razorbill feature of the SPA from the Project alone or in-combination with other projects.

On the 18th June 2023, The Applicant confirmed that a commercial agreement had been signed between bp (on behalf of NEP) and the Applicant, and that there were no longer any requirements for protective provisions under the Hornsea Four DCO for bp or any other party involved in the NEP Project. The protective provisions for other scenarios were not considered to have a discernible impact on bird mortalities.

5.7.12.1 The Secretary of State's conclusion

The Secretary of State agrees with the ExA that displacement mortalities would not undermine the conservation objectives for the razorbill feature of the Flamborough and Filey Coast SPA and an AEoI from the Project alone, and in-combination with other projects can be excluded.

5.7.13 Seabird assemblage: Alone

LSEs were identified for the seabird assemblage from collision mortality and barrier effect during the operation phase; and displacement and disturbance during all phases of the Project; and from changes in prey availability and behaviour caused by piling noise during the construction phase.

Collision mortality

The assessment of collision impacts on gannet and kittiwake are detailed above. The Applicant calculated that the annual collision mortality rate for herring gull would be less than one individual per year and the figures were not apportioned to the SPA [REP6-026, Tables 15 to 18].

NE [REP7-104] calculated that the collision mortalities for herring gull would be less than two individuals per year and concluded that this would not significantly affect the herring gull population. No concerns were raised regarding other component species of the seabird assemblage.

Displacement and disturbance

The Applicant calculated an annual mortality of 0.9 puffins from the Project [REP7-085, Section 4]. The Applicant's population modelling results [REP6-026, Table 48] concluded there would be no AEoI on the SPA puffin population [REP7-085, Table 11].

NE calculated an annual mortality of between 1 and 14 puffin per year from the Project alone, resulting in a reduction in the population growth rate of 0.03% to 0.17% per annum. Using what it considered to be a realistic displacement rate of 70% and mortality rate of 2% for puffin, it estimated three additional mortalities [REP7-104].

There were no discussions regarding any of the other component species of the seabird assemblage during the Examination in respect of displacement and disturbance.

Barrier effects

The assessment of barrier effects on guillemot and razorbill are detailed above. No concerns were raised regarding other component species of the seabird assemblage.

Changes in prey availability and behaviour

Herring is a prey species of some of the Flamborough and Filey Coast SPA qualifying features. The Applicant has proposed seasonal restriction of piling at the offshore HVAC booster stations (Work No. 3) to mitigate effects on the Banks herring spawning ground. The ExA concluded that piling restrictions secured through the recommended DCO would mitigate significant effects on herring.

The Applicant [REP6-039] concluded that an AEoI of the seabird assemblage feature of the Flamborough and Filey Coast SPA could be ruled out, because no component species would be lost and the overall abundance of the assemblage would be maintained at the level specified in the conservation objectives (above 216,730 individuals), whilst also avoiding deterioration from its current level as indicated by the latest peak mean count or equivalent.

NE [REP7-104] concluded that whilst it did not expect species diversity to be affected, it could not conclude that the overall abundance of the assemblage would be maintained due to the

predicted impact on guillemot which are a component of the assemblage, and uncertainty regarding the impacts of the proposal on marine processes. Furthermore, it could not conclude that the extent, distribution, and quality of supporting breeding habitat would be maintained. It therefore could not exclude an AEoI of the seabird assemblage from the Project alone.

The RSPB [REP7-098] also concluded that an AEoI from the Project could not be excluded due to the impact of combined collision and displacement mortality on the seabird assemblage.

5.7.13.1 ExA conclusion

The ExA concluded that species diversity would not be affected and that the impacts on abundance, across the suite of species, would not result in a significant percentage reduction in the overall number of seabirds in the assemblage.

The ExA noted that one of the conservation objectives for the Flamborough and Filey Coast SPA is to maintain the distribution, abundance and availability of key food and prey items. NE's concerns relating to changes in prey availability and behaviour apply to all features of the Flamborough and Filey Coast SPA. The ExA concluded that the availability of prey would not be negatively affected by impacts on the Flamborough Front or Smithic Bank or from piling at the offshore HVAC booster stations (Work No. 3).

The ExA was also satisfied that there would be no direct habitat loss from the Flamborough and Filey Coast SPA itself. It considered the possible ecological impacts on the population of potential exclusion from the array area in terms of supporting habitat, including the potential effect of displaced birds being forced to compete with others in adjacent sea areas. The ExA was content that this was accounted for in the auk displacement assessments and that no further allowance is merited.

5.7.13.2 The Secretary of State's conclusion

The Secretary of State agrees with the ExA's conclusion that the identified effect pathways would not undermine the conservation objectives for the seabird assemblage feature of the Flamborough and Filey Coast SPA. The Secretary of State concludes that an AEoI from the Project alone can be excluded.

5.7.14 Seabird assemblage: In-Combination

The Applicant [REP6-039] concluded that although there would be an in-combination AEoI for kittiwake, the species would not be lost from the assemblage. Furthermore, the impacts on abundance, across the suite of species, would not result in a significant reduction of the overall number of seabirds in the assemblage given that the populations of the majority of the component species are increasing. The Applicant also concluded that the Project alone and in combination with other projects is unlikely to result in a significant risk to the species assemblage, as no one species is likely to be lost: therefore, an AEoI on the seabird feature of the SPA could be excluded.

NE [REP7-104] advised that the SPA herring gull population would not be significantly impacted. In respect of the puffin's contribution to the seabird assemblage, NE predicted 17 puffin mortalities per annum, based on a 70% displacement and 2% mortality rate. It concluded that

in-combination displacement effects would exert pressure on the puffin population but would not be sufficient to trigger an AEoI of the seabird assemblage. It noted significant uncertainty in this conclusion due to difficulties monitoring the colony and the ability to predict future trends.

5.7.14.1 ExA conclusion

The ExA concluded that the diversity of the seabird assemblage feature would not be affected when the effects of the Project are considered in combination with other plans and projects. When assessed against a background of an increasing total assemblage size, it considered that the in-combination impacts on abundance across the suite of species would not result in a significant percentage reduction in the overall number of seabirds in the assemblage, and that AEoI could therefore be excluded.

5.7.14.2 The Secretary of State's conclusion

The Secretary of State agrees with the ExA's conclusion that the effects of the in-combination projects would not undermine the conservation objectives for the seabird assemblage feature of the Flamborough and Filey Coast SPA. The Secretary of State concludes that an AEoI from the Project, in combination with other projects, can be excluded.

5.8 Greater Wash SPA

The Greater Wash SPA covers 353,578 ha and is located between Bridlington Bay, East Yorkshire and the area just north of Great Yarmouth on the Norfolk coast. The SPA has a landward boundary at Mean High Water and an offshore extent of around 30 km. The array is approximately 63.4 km from the SPA and the ECC is 0.4km from the SPA at the closest point.

The Greater Wash qualifies as an SPA under Article 4.1 of the Birds Directive (79/409/EEC) by regularly supporting populations of Annex I species of European importance: breeding populations of Sandwich tern, common tern and little tern; non-breeding red-throated diver and little gull; and the regularly occurring migratory species common scoter.

The Secretary of State has considered the potential for the Project to constitute an AEoI for each feature for which a significant effect is likely.

The qualifying features and impact pathways which have been considered in this assessment are:

- red-throated diver: disturbance and displacement (all Project phases);
- common scoter: disturbance and displacement (all Project phases); and
- little gull: collision risk (operation and maintenance phases).

The Applicant concluded no AEoI for all qualifying features of the Greater Wash SPA.

5.8.1 Red throated diver and common scoter: Alone and In-Combination

5.8.1.1 Disturbance and displacement

The Applicant submitted an assessment of effects from cable laying activities during construction on common scoter and red throated diver in the ECC [REP2-049]. This stated that the overlap between the 2km cable buffer zone and the SPA would be a maximum of 0.4% of the entire SPA. It also stated that applying NE's maximum advised mortality rate of 10% would lead to a maximum predicted increase in mortality relative to baseline mortality of 0.13% for red throated diver and 0.12% for common scoter.

NE subsequently agreed that AEol from disturbance and displacement of these species could be excluded from the Project alone [REP8-029]. However, it stated that it was unable to rule out an in combination AEol with the inclusion of Sheringham and Dudgeon Extension Projects, due to the lack of detailed information available for these projects.

5.8.1.2 ExA conclusion

The ExA considered that based on information available at the time of the Examination, an AEol could be excluded for the common scoter and red-throated diver features of the SPA, both alone and in-combination: however, it advised that the Secretary of State may wish to reconsider the potential for in-combination with Sheringham and Dudgeon Extension Projects if further information becomes available before a decision is made.

5.8.2 Little gull: Alone and In-combination

5.8.2.1 Collision risk

No concerns were raised during Examination regarding the effects of collision on little gull.

5.8.2.2 ExA conclusion

The ExA recommended that an AEol of the little gull feature can be excluded for the Project alone and in-combination with other projects.

5.8.2.3 The Secretary of State's conclusion

The Secretary of State concludes that collision mortalities would not undermine the conservation objectives for little gull. The Secretary of State therefore concludes that an AEol of the Greater Wash SPA from the effects of collision mortality on little gull from the Project alone or in-combination with other plans and projects can be excluded.

5.8.3 Additional information

On 16th December 2022, the Secretary of State requested that the Applicant provide updated in-combination assessments for disturbance and displacement effects on the red-throated diver and common scoter features of the SPA, which included the latest figures from the Sheringham Extension and Dudgeon Extension projects.

The Applicant responded on 16 December 2022⁷³. The Applicant concluded that even when considering a displacement rate of 100% and NE's upper range of 10% mortality, the predicted impact level in-combination is less than a single red-throated diver (0.6) per annum. It therefore concluded that AEol can be excluded in-combination on the red-throated diver. The Applicant stated that as no assessment of the common scoter feature of the Greater Wash SPA was undertaken by Sheringham Shoal and Dudgeon Extension, an in-combination assessment was not possible. No common scoter were recorded within the array area plus 4 km buffer and only a single red-throated diver was recorded flying within the array area plus 4 km buffer throughout the full 24 months of site-specific surveys, therefore it was concluded that no connectivity exists between the Hornsea Four array area and the Greater Wash SPA, and therefore no contribution from the Project to any operational phase in-combination displacement impacts.

On 9th February 2023, the Secretary of State requested that NE comment on the adequacy of the updated in combination models and confirm whether it could conclude that an AEol could be excluded. NE responded to this request on 9 March 2023⁷⁴ stating that it considered the updated material to be adequate to assess the potential for in-combination impacts on ornithology receptors at Greater Wash SPA from the Project. NE noted that the Applicant had made a commitment that construction and operational maintenance vessels will avoid high concentrations of rafting red-throated diver, which was welcomed. However, this mitigation forms part of a wider set of measures developed by NE as a Best Practice Protocol for vessels in red-throated diver SPAs (Annex 2 of its response). If Hornsea 4 were able to commit to incorporating the Best Practice Protocol in full within their Vessel Management Plan or another conditioned document, NE would be able to advise that the Project would not contribute to in-combination effects on the Greater Wash SPA.

On the 20th March 2023, the Secretary of State invited the Applicant to confirm whether it would include all measures recommended by NE in its '*Best Practice Protocol for Vessels in Red-throated Diver SPA's*', in the Vessel Management Plan.

The Applicant responded to the consultation letter on 17 April 2023⁷⁵ and stated that it had agreed with NE to include a commitment to adhere to the best practice protocol for red-throated diver for the operation and maintenance of Hornsea Four. It provided an updated Outline Offshore Operations and Maintenance Plan⁷⁶ and Outline Cable Specification and Installation Plan⁷⁷ which secured this commitment. The requirement as secured is:

⁷³<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002234-G9.2%20Applicants%20Response%20to%20RFI%20dated%2016%20December.pdf>

⁷⁴<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002246-Natural%20England%20SoS%20Consultation%20Response.pdf>

⁷⁵<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002270-G12.1%20Applicant's%20Response%20Letter%20to%20RFI%20dated%2020%20March%202023.pdf>

⁷⁶<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002265-G2.7%20Outline%20Offshore%20Operations%20and%20Maintenance%20Plan%20TRACKED.pdf>

⁷⁷<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002267-F2.15%20Outline%20Cable%20Specification%20and%20Installation%20Plan%20TRACKED.pdf>

“Vessel disturbance: using best practice in the management of vessel traffic, a significant disturbance to Red Throated Diver (RTD), can be avoided. The Applicant will have regard to best practice during the construction of Hornsea Four in accordance with this section. Example of relevant best practice include where reasonably practicable:

- *avoid works within or within 2km of a Special Protection Area designed for RTD during the over winter period 1st Nov – 31st March inclusive;*
- *selecting routes that avoid known aggregations of birds;*
- *restricting (to the extent reasonably possible) vessel movements to existing navigation routes (where the densities of divers are typically relatively low);*
- *maintaining direct transit routes (to minimise transit distances through areas used by divers);*
- *avoidance of over-revving of engines (to minimise noise disturbance); and*
- *briefing of vessel crew on the purpose and implications of these vessel management practices (through, for example, tool-box talks).”*

NE subsequently confirmed on 17 April 2023⁷⁸ that as a result of the incorporation of this mitigation, the Project will not contribute to in-combination effects on the Greater Wash SPA.

5.8.3.1 The Secretary of State’s conclusion

The Secretary of State has reviewed the additional information and is satisfied that, having regard to the Applicant’s case and mitigation measures secured in the DCO, the views of NE and the recommendation of the ExA, that an AEoI of the common scoter and red-throated diver features of the Greater Wash SPA can be excluded for the Project alone and in combination with other plans or projects.

⁷⁸<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002261-EN010098%20-%20Natural%20England%20-%20SoS%20Consultation%20Response.pdf>

6 Transboundary assessment

Given the potential for this Project to affect mobile features across a wide geographical area, the Secretary of State is of the view that it is important to consider the potential impacts on protected sites in other EEA states, known as ‘transboundary sites’ in further detail⁷⁹. Information on transboundary impacts and processes is available in PINS Advice Note 12⁸⁰. The ExA also considered the implications for these sites, in the context of looking at the wider EIA considerations. The results of the ExA’s consideration and the Secretary of State’s own views on this matter are presented below.

- The Applicant’s screening assessment also considered protected sites outside the UK NSN [APP-167 amended by AS-014].

The Applicant concluded that no AEoI exists for a transboundary effect from the Project alone and/or in-combination [APP-167] and [REP5-012]. This conclusion was not disputed by IPs [ER 13.6.6].

On 1 October 2019 following the receipt of the Applicant’s Scoping Report, the Planning Inspectorate undertook a transboundary screening and consultation on behalf of the Secretary of State [OD-003] under Regulation 32 of the 2017 EIA Regulations and the United Nations Environment Programme Convention on Biological Diversity 1992. It was concluded that significant effects on the environment of EEA states were likely. A notice was placed in the London Gazette [OD-004] on 11 October 2019 and the following states were notified of the Project:

- Belgium;
- Denmark;
- France;
- Germany;
- Norway;
- Iceland;
- Sweden;
- The Netherlands; and
- The Republic of Ireland.

No EEA States replied to the initial notification.

A second screening [OD-003] was carried out on 25 November 2021 following acceptance of the Application for Examination. The second screening concluded that the Planning Inspectorate remained of the view that the Project is likely to have a significant effect on the environment in the EEA States as a result of impacts to marine mammals and commercial fisheries. No new EEA States were identified as likely to be affected. On a precautionary basis, notification letters were re-sent to all the states that were initially notified. The Republic of Ireland [OD-011]

⁷⁹https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/408465/transboundary_guidelines.pdf

⁸⁰<https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-twelve-transboundary-impacts-and-process/>

responded to the notification to confirm that it did not wish to participate in the transboundary EIA procedure. Denmark [OD-009] and Belgium [OD-010] confirmed their wish to participate and were subsequently consulted by the Planning Inspectorate. Consultation responses were received from both parties. No responses were received from any of the other notified EEA States.

In its consultation response, the Irish Government noted that it was unlikely that there was a linkage between the Project and marine mammal populations in Ireland. The Belgian Government responded that it had no comments on the transboundary consultation and did not participate further. The Danish Government's consultation response gave advice on mitigation measures for impacts on marine mammals and offshore ornithology, but it did not specifically refer to impacts on protected sites.

The Secretary of State notes that the Applicant considered non-UK transboundary sites in its application and it concluded that there would be no AEol of any transboundary sites from the Project alone and in-combination. The ExA did not note any objections to this conclusion.

The Secretary of State concludes that he has not been presented with any substantive evidence to demonstrate that the Project would have a significant adverse effect on any transboundary site. 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 AEol on any transboundary protected site.

7 Appropriate assessment conclusions

As the competent authority for energy NSIPs as defined under the Planning Act 2008, the Secretary of State has undertaken an AA under Regulation 63 of the Habitats Regulations and Regulation 28 of the Offshore Habitats Regulations. The Secretary of State has undertaken an AA in respect of the conservation objectives of 35 protected sites to determine whether the Project, either alone or in-combination with other plans or projects, will result in an adverse effect on site integrity.

The Secretary of State has carefully considered all of the information available to him, including the advice from the SNCB, the recommendations of the ExA and the views of all IPs, including the Applicant.

The Secretary of State is satisfied that, given the relative scale and magnitude of the identified effects on the qualifying features of the protected sites and where relevant, the measures in place to avoid or reduce potential adverse effects secured in the DCO and DML, there would not be any implications for the achievement of site conservation objectives and therefore adverse effects on site integrity can be excluded for:

- Humber Estuary SAC;
- Humber Estuary Ramsar;
- Southern North Sea SAC;
- Moray Firth SAC;
- The Wash and North Norfolk Coast SAC;
- Berwickshire and North Northumberland Coast SAC;
- Greater Wash SPA;
- Humber SPA and Ramsar; Hornsea Mere SPA;
- Northumbria Coast SPA;
- Teesmouth and Cleveland Coast SPA;
- Coquet Island SPA;
- Farne Islands SPA;
- Northumberland Marine SPA;
- St Abb's Head and Fast Castle SPA;
- Forth Islands SPA;
- Flamborough Head SAC;
- Outer Firth of Forth and St Andrew's Complex pSPA;
- Fowlsheugh SPA;
- Buchan Ness to Collieston Coast SPA;
- Troup, Pennan and Lion's Heads SPA;
- East Caithness Cliffs SPA;
- North Caithness Cliffs SPA;
- Copinsay SPA;
- Hoy SPA;
- Marwick Head SPA;
- Rousay SPA;
- Calf of Eday SPA;
- West Westray SPA;
- Fair Isle SPA;
- Sumburgh Head SPA;
- Noss SPA;
- Foula SPA;
- Fetlar SPA; and
- Hermaness, Saxa Vord and Valla Field SPA.

However, the Secretary of State concurs with the ExA, in accordance with the advice of NE, that adverse effects on integrity cannot be ruled out beyond reasonable scientific doubt in relation to:

- collision mortality effects on the kittiwake of the Flamborough and Filey Coast SPA, in combination with other projects; and
- displacement and disturbance of the guillemot of the Flamborough and Filey Coast SPA, in combination with other projects.

The Secretary of State has not identified any further mitigation measures that could reasonably be imposed which would avoid or mitigate the potential AEoI identified and has therefore proceeded to consider the derogation provisions of the Habitats Regulations, as presented in Sections 8 to 11 below.

The Secretary of State concludes that the Project does not meet the integrity test and that the further tests set out in the Habitats Regulations now apply. These include Stage Three (an assessment of alternative solutions), Stage Four (Test for Imperative Reasons of Overriding Public Interest), and Stage Five (a consideration of environmental compensation). The Secretary of State's consideration of information provided to inform these further tests are presented in subsequent Sections alongside his conclusions.

8 Consideration of case for Derogation

Based on the AA the Secretary of State cannot conclude, beyond all reasonable scientific doubt, the absence of an adverse effect from the Project in-combination, on the integrity of the Flamborough and Filey Coast SPA.

The Secretary of State has therefore decided to review the Project in the context of Regulations 64 and 68 of the Habitats Regulations and Regulations 29 and 36 of the Offshore Habitats Regulations to determine whether the Project can be consented. References to Regulations 29 and 36 below should be read as references to Regulations 64 and 68 if applicable.

Regulation 29 allows for the consenting of a project that is required for imperative reasons of overriding public interest (“IROPI”), even though it would cause a negative AEol of a protected site. Consent may only be given under Regulation 29 where no alternative solutions to the project are available which are less damaging to the affected protected site and where Regulation 36 is satisfied.

Regulation 36 requires the appropriate authority to secure any necessary compensatory measures to ensure that the overall coherence of the UK NSN is protected.

This part of the Project review has followed a sequential process whereby:

- alternative solutions to the Project have been considered;
- consideration has been given to whether there are IROPI for the Project to proceed; and
- compensation measures proposed by the Applicant for ensuring that the overall coherence of the UK NSN is protected have been assessed.

9 Assessment of alternative solutions

The Secretary of State has identified the objectives of the Project and has considered how these objectives could be met by alternative solutions with a lesser impact on protected sites.

9.1 Project objectives

The Applicant's assessment applied a sequential process to the consideration of alternatives, first identifying the objectives of the Project, then the potential harm to protected sites, followed by consideration of alternative solutions and their feasibility [REP1-014]. This comparison considered the 'do nothing' option, alternative locations, alternative design, and alternative means of operation. The Applicant did not make a comparison of the impacts of the identified alternatives on the UK NSN, as it considered [REP1-014, Section 13] there to be no feasible alternative solutions that would deliver the aims of the Project.

The Applicant identified the need for the Project and how the Project addresses such need in Section 10 of [REP1-014]. The Applicant outlines a series of objectives for the Project which include those that define the strategic function of the Project within the UK energy strategy and others that have been adopted to influence certain aspects of the design of the development or reflect the geographical constraints available to the Applicant.

The objectives for the Project as defined by the Applicant were listed in its 'Habitats Regulations Assessment Without Prejudice Derogation Case Part 1-3' [REP1-014]. In summary they are to:

- support decarbonisation and security of the UK's energy supply by developing a large-scale offshore wind farm to optimise generation and export capacity;
- develop a project at low cost to the consumer;
- deliver a significant volume of offshore wind in the 2020s (Hornsea Four could generate power from 2028/ 2029);
- optimise the use of available sites by offshore wind development through further development within the former Hornsea Zone of the north-western portion;
- develop an array which makes optimal use of viable developable seabed within the western portion of former Hornsea Zone;
- make efficient use of available grid connection capacity;
- to be delivered in a safe and efficient manner; and
- to provide flexibility to allow for future technological innovation which would complement a Hornsea Four wind farm.

Having regard to the suite of objectives identified by the Applicant in the context of National Policy Statements on energy (EN-1)⁸¹ and renewable energy infrastructure (EN-3)⁸², the Secretary of State considers the primary objectives of the Project to be:

⁸¹ Department of Energy & Climate Change. *Overarching National Policy Statement for Energy (EN-1)*. TSO, 2011.

⁸² Department of Energy & Climate Change. *National Policy Statement for Renewable Energy Infrastructure (EN-3)*. TSO, 2011.

- To generate low carbon electricity from an offshore wind farm support of the decarbonisation of the UK electricity supply; and
- To export electricity to the UK National Grid to support UK commitments for offshore wind generation and security of supply.

In his assessment of alternatives, the Secretary of State has not constrained himself solely to those alternatives that could be delivered by the Applicant. Nevertheless, the Secretary of State acknowledges that any alternative must be economically feasible for the developer and allow the developer to fulfil the terms of its lease with The Crown Estate.

9.1.1 Identification of alternative solutions

The ExA [ER 13.10.4] considered alternative forms of energy generation in the context of the alternative solutions test and was satisfied that, in line with the 2021 joint guidance⁶, other forms of energy generation would not meet the aim of the Project. Furthermore, other wind farm proposals do not present an alternative solution as all available projects are required in order to meet UK 2030 targets for renewable energy. The ExA noted that these conclusions are in line with those of the Secretary of State's HRAs for the East Anglia ONE North and East Anglia TWO Offshore Wind Farm projects.

In accordance with relevant guidance, the Secretary of State does not consider that alternative forms of energy generation meet the objectives for the Project. Alternatives to the Project considered by the Secretary of State, and assessed by the Applicant, are consequently limited either to 'do nothing' or to alternative offshore wind farm projects.

Alternative types of offshore wind farm projects considered are:

- Offshore wind farms not in the UK Exclusive Economic Zone ("EEZ")
- Offshore wind farms within the UK EEZ; and
- Feasibly alternative designs for the Project.

The Applicant presents its assessment of alternatives, with regards to the above criteria, in section 12 of [REP1-014].

9.2 Consideration of alternative solutions

9.2.1 'Do Nothing'

Not proceeding with the Project would remove the risk of impacts to kittiwake and guillemot of the Flamborough and Filey Coast SPA, but in HRA terms 'do nothing' would fail to meet the objectives of the Project and is not considered a feasible alternative solution.

The benefits from the Project are established by the Applicant [REP1-014]. In summary, the key drivers underpinning the urgent need for renewable energy, within the UK are:

- The need for energy security, including:
 - The need to secure safe, affordable, reliable energy, preferably generated in the UK for the UK market;

- The need to replace existing ageing energy generation infrastructure;
- The need to meet expected electricity demand whilst meeting climate change commitments; and
- The need to reduce greenhouse gas emissions by increasing energy generation from low carbon sources, replacing high carbon energy sources such as coal and gas.

Once constructed, the Project would make a significant contribution to the achievement of both the national renewable energy targets and to the UK's contribution to global efforts to reduce the effects of climate change.

The ExA concluded [ER13.10.6] that a compelling need for the Project has been established and that the 'do nothing' option is not a feasible alternative solution, as it would fail to meet the aim of the Project in meeting that compelling need.

9.2.2 Offshore wind farms not in UK EEZ

The Secretary of State considers that offshore wind farm projects which are located outside of UK territorial waters are not an alternative to the Project since this would not meet the objective to support decarbonisation and security of the UK's energy supply by developing a large-scale offshore wind farm to optimise generation and export capacity.

Although the UK is party to international treaties and conventions in relation to climate change and renewable energy, according to the principle of subsidiarity and its legally binding commitments under those treaties and conventions, the UK has its own specific legal obligations and targets in relation to carbon emission reductions and renewable energy generation. Other international and EU countries similarly have their own (different) binding targets. Sites outside the UK are required for other countries to achieve their own respective targets in respect of climate change and renewable energy.

9.2.3 Alternative locations within the UK

The site selection for all offshore wind proposals in the UK is controlled by The Crown Estate leasing process. Sites not within the areas identified by The Crown Estate leasing process or outside of that which the Applicant has secured (the former Hornsea Zone of the north-western portion) are not legally available, and therefore do not represent alternative locations.

The ExA [ER13.10.8] stated that consideration of alternative locations is intrinsically linked to the consideration of other available projects, given that site selection for all offshore wind proposals in the UK is bound by TCE's leasing process. Sites outside the zones identified by TCE or the lease area that the Applicant has secured through the bidding process are not legally available. The ExA was satisfied that there are no other locations or sites that would represent a feasible alternative.

9.2.4 Alternative designs

Alternative designs considered by the Applicant [REP1-014] included the number of turbines (and their layout), the minimum lower tip height (height of turbine blades above sea surface) and rotor diameter, and the developable area.

The Applicant stated that consideration has been given to feasible alternatives throughout the development process for the Project. This has formed a fundamental driver for decision making within the Project, from the technical options within the engineering side to the macro-siting (avoidance of large-scale features and designated sites) and route optioneering during the development of the Hornsea Four ECC routing. This included the adoption of three major site reductions from the Area for Lease (“AFL”) presented at Scoping (846 km²) to the PEIR boundary (600 km²), with a further reduction adopted for the ES and DCO application (468 km²) due to the findings of the impact assessment presented at PEIR, technical considerations and stakeholder feedback. In addition to the major reduction in the size of the proposed developable area, the Project has avoided the offshore ECC and cable landfall (below MHWS) route crossing the offshore extent of the FFC SPA designated site, which extends some kilometres offshore from the FFC cliffs to the east and south. In exploring alternatives, the Applicant considers it has taken meaningful consideration of viable and feasible alternatives while seeking to balance the environmental constraints with the Project development [REP1-014].

The Applicant stated [REP1-014] that it has continued to re-appraise all elements of the MDS for the Project to ensure that feasible and practical mitigation has been deployed, where deemed appropriate to do so (to eliminate or reduce LSE in EIA terms). The Project has adopted commitments (primary design principles inherent as part of the Project, installation techniques and engineering designs/modifications) as part of their pre-application phase, to eliminate and/or reduce the LSE arising from a number of impacts (as far as possible). These are outlined in full in Volume A4, Annex 5.2: Commitments Register.

The Applicant concludes [REP1-014] that, whilst some alternatives may meet the Project need and objectives, there are no feasible alternative solutions to the Project.

The ExA considered the Applicant’s description of alternatives in the ES [APP-009] and [APP-010, amended by AS-006] and explored the potential for further, post-submission design changes or mitigation proposals that could reduce or avoid AEol and could amount to alternative solutions (ExQ1 [PD-006, HRA 1.21] and ExQ2 [PD-012, HRA 2.2]).

The ExA [ER 13.10.10] noted that the Applicant refined the MDS for some parameters including: a reduction of sandwave clearance volumes; location of the Dogger Bank A and B cable crossing; and a restriction to a maximum of 80 GBS foundations for turbines. These were described in the Clarification Note: Justification of Offshore Maximum Design Scenarios [REP3-035]. The Applicant considered that no implications for the information supporting its assessment of AEol were anticipated and confirmed that no further design alternatives or mitigation options were under consideration [REP2-038] and [REP5-074]. The Applicant submitted its final updated ES project description chapter at Deadline 7 [REP7-002] to reflect the amendments to the MDS.

As noted in Chapter 10 of the ER, British Petroleum Exploration Operating Company Ltd (“bp”) on behalf of the Endurance Carbon Capture project [REP1-057] sought protective provisions to ensure ‘no overlap’ between Endurance and the Project. The Applicant [REP5-074] and [REP5a-016] considered that the ‘no overlap solution’ would make no material difference to the conclusions of the HRA and would not result in lesser adverse effects than the development as proposed. The ExA [ER 13.10.18] was satisfied that while the exclusion of overlap between the Endurance Carbon Capture project and the Project would reduce the area within the DCO boundary occupied by infrastructure, the MDS would not be affected. The ExA concluded that in light of this there would be no implications for the assessments of effects on protected sites and

therefore the 'no overlap' alternative does not represent an alternative solution that would result in less harm to the Flamborough and Filey Coast SPA.

9.3 Conclusion

The ExA [ER 13.10] considered the information on alternatives submitted by the Applicant and other IPs during Examination. It was satisfied that alternative sites had been properly considered. The ExA [ER 13.10.20] was satisfied that there are no alternative solutions that would deliver appreciable benefits in terms of reduced adverse effects on the integrity of the Flamborough and Filey Coast SPA. The ExA [ER 13.10.21] considered that this conclusion does not preclude further design refinements being made following the completion of further site investigations (in the post-decision stage), for example during the choice of foundation types. These refinements may result in reduced impacts, though no compelling evidence has been presented that they could avoid AEol.

Following a review of the information submitted by the Applicant and comments provided by IPs, as well as the recommendation of the ExA and having identified the objectives of the Project and considered all alternative solutions to fulfil these objectives, the Secretary of State is satisfied that no alternative solutions are available that would meet Project objectives with an appreciable reduction in predicted impacts to protected sites, and IROPI must be considered. The Secretary of State notes that further design refinements have been made since the close of Examination, notably the removal of GBS as a foundation type for WTGs, but he considers that this is not necessary to avoid an AEol of any protected site (see Section 5.4). The Secretary of State considers that alternative scales or designs which would reduce capacity for electricity generation would fail to meet the objectives of the Project. Therefore, the Secretary of State agrees with the ExA and does not consider that the Project constrained by Protective Provisions is an alternative solution in HRA terms.

10 Stage 4: Imperative Reasons of Overriding Public Interest

The HRA derogations provide that a project having an AEoI of a protected site may proceed (subject to a positive conclusion on alternatives and provision of any necessary compensation) if there are IROPI.

This section of the HRA determines whether there are IROPI for the Project to proceed subject to adequate compensatory measures being implemented.

The HRA derogations identify certain in-principle grounds of IROPI that may be advanced in favour of such a project. Where the site concerned hosts a priority natural habitat or a priority species, grounds for IROPI should include human health, public safety or beneficial consequences of primary importance to the environment but otherwise may also be of a social or economic nature, in accordance with Defra's guidance. The Applicant's derogation case [REP1-014, Section 16.1] concluded that the identified affected features of the Flamborough and Filey Coast SPA were not priority species and therefore the case presented for IROPI included consideration of social and economic benefits.

The parameters of IROPI are explored in relevant guidance, including the 2021 joint guidance⁶ and the European Commission (2018)⁵, which identify the following principles:

- Imperative – urgency and importance: There would usually be urgency to the objective(s), and it must be considered "indispensable" or "essential" (i.e. imperative). In practical terms, this can be evidenced where the objective falls within a framework for one or more of the following;
 - (i) actions or policies aiming to protect fundamental values for citizens' life (health, safety, environment);
 - (ii) fundamental policies for the State and the Society; or
 - (iii) activities of an economic or social nature, fulfilling specific obligations of public service.
- Public interest: The interest must be a public rather than a solely private interest (although a private interest can coincide with delivery of a public objective).
- Long-term: The interest would generally be long-term; short-term interests are unlikely to be regarded as overriding because the conservation objectives of protected sites are long term interests.
- Overriding: The public interest of development must outweigh the harm, or risk of harm, to the integrity of the protected site that's predicted by the AA.

The Applicant provided a case for IROPI in [REP1-014]. Part 3 set out the Applicant's reasoning that there is a compelling case that Project must be carried out for IROPI in view of its social and economic benefits, which align with (and are needed to achieve) UK Government policy aspirations and legal commitments. It found an imperative need for the Project, that it would be in the public interest, and that the need overrides its predicted impacts on the Flamborough and Filey Coast SPA. Only impacts on the Flamborough and Filey Coast SPA were discussed in the Applicant's case. The ExA described its findings in respect of IROPI at Section 13.11 of its recommendation report and discussed the need for the Project and the overall case for Development Consent in Chapters 5 and 14, including the public benefits it would bring. The

Secretary of State has reviewed this supporting information and given full regard to relevant guidance.

The Secretary of State is satisfied that there are IROPI for the Project to proceed subject to adequate compensatory measures being implemented. In arriving at his decision, the Secretary of State has reviewed how the Project provides a public benefit which is both essential and urgent despite the predicted impacts on kittiwake and guillemot and harm to the integrity of the Flamborough and Filey Coast SPA.

This decision is predicated by the principal and essential benefit of the Project as a significant contribution to limiting the extent of climate change in accordance with the objectives of the Paris Agreement. The consequences of not achieving those objectives would be severely detrimental to societies across the globe, including the UK, to human health, to social and economic interests and to the environment.

The need to address climate change is the principal tenet behind the Climate Change Act 2008 (“2008 Act”), and subsequently published National Policy Statements for energy (EN-1)⁸³, renewable energy infrastructure (EN-3)⁸⁴, electricity networks (EN-5)⁸⁵ provide a framework for delivering the UK’s international commitments on climate change. Measures set out in the NPSs have been given further impetus to reflect evolving understanding of the urgency of actions to combat climate change, including a commitment to reduce greenhouse gas emissions to net zero by 2050, which is now reflected in domestic law through amendments to the 2008 Act.

The Government’s strategy for decarbonisation to achieve this commitment relies on contributions from all sectors delivered through multiple individual projects implemented by the private sector. The Government has also set up schemes to facilitate the deployment of such projects and to provide the public with value for money, such as via the Contracts for Difference scheme.

The Government anticipates that decarbonisation will lead to a substantially increased demand for electricity as other power sources are at least partially phased out or transformed and other sectors, such as heat and transport, electrify.

The UK has also committed to decarbonise the electricity system by 2035, subject to security of supply, focusing on ‘home-grown technologies’⁸⁶. This will require the establishment of a reliable and secure mix of low-carbon electricity sources, including large scale development of offshore wind generation. The scale of the contribution of offshore wind to the electricity supply mix is reflected in the targets set by the Government for 50 GW of offshore wind by 2030.

Offshore wind generation schemes can only be developed through the mechanism put in place by The Crown Estate for leasing areas of the seabed in a structured and timely way. Projects

⁸³ Department of Energy & Climate Change. *Overarching National Policy Statement for Energy (EN-1)*. TSO, 2011.

⁸⁴ Department of Energy & Climate Change. *National Policy Statement for Renewable Energy Infrastructure (EN-3)*. TSO, 2011.

⁸⁵ Department of Energy & Climate Change. *National Policy Statement for Electricity Networks Infrastructure (EN-5)*. TSO, 2011.

⁸⁶ <https://www.gov.uk/government/news/plans-unveiled-to-decarbonise-uk-power-system-by-2035>

which make a significant contribution to meeting the target capacity in the timeframe required are therefore both necessary and urgent.

These considerations are expanded on in the following sections.

10.1 The National Policy Statements (“NPSs”)

10.1.1 Establishing the basis provided by the 2011 NPSs

The NPSs were established against obligations made as part of the Climate Change Act 2008 (‘CCA2008’). The overarching NPS for Energy (NPS EN-1) sets out national policy for energy infrastructure in Great Britain (GB). It has effect, in-combination with the relevant technology-specific NPS, on recommendations made by the PINS to the Secretary of State on applications for energy developments that fall within the scope of the NPSs⁸⁷. These provide the primary basis for decisions by the Secretary of State.

The NPSs set out a case for the need and urgency for new energy infrastructure to be consented and built with the objective of supporting the Government’s policies on sustainable development, in particular by:

- Mitigating and adapting to climate change; and
- Contributing to a secure, diverse and affordable energy supply⁸⁸.

The NPS for renewable energy infrastructure covers those technologies which, at the time of publication in 2011, were technically viable at generation capacities of over 50 MW onshore and 100 MW offshore. This includes offshore wind, and as such the need for this technology is fully covered by the NPS.

The Energy White Paper, Powering Our Net Zero Future, was published on 14 December 2020. It announced a review of the suite of energy National Policy Statements but confirmed that the current National Policy Statements were not being suspended in the meantime. The 2011 energy National Policy Statements therefore remain the basis of the Secretary of State’s consideration of the Application.

The arguments which support a national need for low-carbon infrastructure made today are consistent with those arguments contained in the NPSs, and indeed the Secretary of State is of the view that the NPSs clearly set out the specific planning policies which the Government believes both respect the principles of sustainable development and are capable of facilitating the consenting of energy infrastructure on the scale and of the kinds necessary to help us maintain, safe, secure, affordable and increasingly low carbon supplies of energy.

The NPSs set out the national case and establish the need for certain types of infrastructure, as well as identifying potential key issues that should be considered by the decision maker. Section

⁸⁷ NPS EN-1 Para 1.1.1

⁸⁸ NPS EN-3 Para 1.3.1

104 of the Planning Act (2008)⁸⁹ makes clear that where an NPS exists relating to the development type applied for, the Secretary of State must have regard to it. The NPSs provide specific policy in relation to offshore wind development, and the policies set out in NPS EN-1, EN-3 and EN-5 therefore apply.

This national need relates both to the decarbonisation of the electricity supply within the required timeframe and to the risk the decarbonisation programme could pose to the security of electricity supply as more traditional generating stations are decommissioned.

With regard to the latter, the Secretary of State notes the ruling in case C-411/17 by the European Court of Justice⁹⁰ that the objective of ensuring the security of the electricity supply constitutes an IROPI.

10.1.2 A Synthesis of the 2011 NPSs

At the time the NPSs were published, scientific opinion was that, to avoid the most dangerous impacts of climate change, the increase in average global temperatures must be kept to no more than 2°C. Global emissions must therefore start falling as a matter of urgency⁹¹.

The energy NPSs were intended to speed up the transition to a low carbon economy and help the UK to realise its climate change commitments sooner than would a continuation under the current planning system⁹². They recognise that moving to a secure, low carbon energy system to enable the UK to meet its legally binding target to cut greenhouse gas emissions by at least 80% by 2050, compared to 1990 levels, is challenging, but achievable. This would require major investment in new technologies to electrify heating, industry and transport, and cleaner power generation⁹³. Under some 2050 pathways, electricity generation would need to be virtually emission-free, because emissions from other sectors were expected still to persist⁹⁴. Consequentially, the need to electrify large parts of the industrial and domestic heat and transport sectors could double electricity demand by 2050⁹⁵.

The NPSs conclude that the UK needs sufficient electricity capacity from a diverse mix of technologies and fuels⁹⁶, and therefore the UK also needs all the types of energy infrastructure covered by the NPSs to achieve energy security at the same time as dramatically reducing greenhouse gas emissions⁹⁷. Thus, all applications for development consent for the types of infrastructure covered by the energy NPSs should be assessed on the basis that the

⁸⁹ <http://www.legislation.gov.uk/ukpga/2008/29/contents>

⁹⁰ Judgement of 29. 7. 2019 – *Case C-411/17 Inter-Environnement Wallonie and Bond Beter Leefmilieu Vlaanderen*. ECLI:EU:2019;622.

⁹¹ NPS EN-1 Para 2.2.8

⁹² NPS EN-1 Para 11.7.2

⁹³ NPS EN-1 Para 2.2.1

⁹⁴ NPS EN-1 Para 2.2.6

⁹⁵ NPS EN-1 Para 2.2.22

⁹⁶ NPS EN-1 Para 2.2.20

⁹⁷ PS EN-1 Para 3.1.1

Government has demonstrated that there is a need for those types of infrastructure and that the scale and urgency of that need is as described within EN-1 Part 3. Substantial weight should therefore be given to the contribution which projects would make towards satisfying this need for a secure, low carbon, electricity supply when considering applications for development consent under the Planning Act 2008^{98,99}. The economic feasibility of harvesting sufficient available natural resource will be an important driver for proposed locations of renewable energy projects¹⁰⁰.

To hit the target of UK commitments to largely decarbonise the power sector by 2030, the NPSs conclude that it is necessary to bring forward new renewable electricity generating projects as soon as possible. The need for new renewable electricity generation projects is therefore urgent.

The NPS expected offshore wind farms to make up a significant proportion of the UK's renewable energy generating capacity up to 2020 and towards 2050¹⁰¹.

10.2 The United Kingdom's legal commitment to decarbonise

This section sets out the obligations of the 2008 Act, against which the NPSs (2011) were established. It then outlines the UK's 2019 legally binding commitment to achieving 'Net-Zero' carbon emissions by 2050, against which the need for future electricity generation developments should be assessed, as well as updated ambitions in the British Energy Security Strategy (2022)¹⁰².

10.2.1 Climate Change Act 2008

The Government, through the 2008 Act, set legally binding carbon targets for the UK¹⁰³, aiming to cut emissions (versus 1990 baselines) by 34% by 2020 and at least 80% by 2050, 'through investment in energy efficiency and clean energy technologies such as renewables, nuclear and carbon capture and storage'.

The 2008 Act is underpinned by further legislation and policy measures. Many of these have been consolidated in the UK Low Carbon Transition Plan ("LCTP")¹⁰⁴, and UK Clean Growth

⁹⁸ NPS EN-1 Para 3.1.3

⁹⁹ NPS EN-1 Para 3.1.4

¹⁰⁰ NPS EN-3, Para 2.6.57

¹⁰¹ NPS EN-3 Para 2.6.1

¹⁰² <https://www.gov.uk/government/publications/british-energy-security-strategy>

¹⁰³ The commitment to decarbonise extends across the United Kingdom of Great Britain and Northern Ireland. Northern Ireland is interconnected with the mainland power system through interconnectors but is operated under a different electricity market framework. Therefore, hereafter we refer to Great Britain ('GB') in relation to electricity generation and transmission, and the UK, to refer to the nation which has legally committed itself to Net-Zero carbon emissions by 2050.

¹⁰⁴ HM Government. *The UK Low Carbon Transition Plan*. HMSO, 2009. Five Point Plan.

Strategy¹⁰⁵. A statutory body, the Committee on Climate Change (“CCC”), was also created by the 2008 Act, to advise the UK and devolved Governments and Parliaments on tackling and preparing for climate change, and to advise on setting carbon budgets. The CCC report regularly to the Parliaments and Assemblies on the progress made in reducing greenhouse gas emissions. The UK government has set five-yearly carbon budgets which currently run until 2032.

10.2.2 Enhancements of existing UK Government Policy on climate change: Net-Zero

The UK context for the need for greater capacities of low-carbon UK generation to come forward with pace, has continued to develop. In October 2018, following the adoption by the UN Framework Convention on Climate Change of the Paris Agreement, the Intergovernmental Panel on Climate Change (‘IPCC’) published a ‘Special Report on the impacts of global warming of 1.5°C above pre-industrial levels. This report concludes that human-induced warming had already reached approximately 1°C above preindustrial levels, and that without a significant and rapid decline in emissions across all sectors, global warming would not be likely to be contained, and therefore more urgent international action is required.

In response, in May 2019 the CCC published their report called: ‘Net-Zero: The UK’s contribution to stopping global warming.’ This report recommended that government extend the ambition of the 2008 Act past the delivery of net UK greenhouse gas savings of 80% from 1990 levels, by 2050. The CCC recommend that ‘The UK should set and vigorously pursue an ambitious target to reduce greenhouse gas emissions (GHGs) to ‘Net-Zero’ by 2050, ending the UK’s contribution to global warming within 30 years.’ The CCC believe that this recommendation is ‘necessary [against the context of international scientific studies], feasible [in that the technology to deliver the recommendation already exists] and cost-effective’, reporting that ‘falling costs for key technologies mean that . . . renewable power (e.g., solar, wind) is now as cheap as or cheaper than fossil fuels.’ Importantly, the CCC recommendation identifies a need for low-carbon infrastructure development which is consistent with the need case set out in NPS EN-1, but points to an increased urgency for action.

Since the implementation of the Climate Change Act 2008, government has set five-yearly carbon budgets. The latest of which is the sixth carbon budget (CB6) which was laid in legislation in April 2021 and commits to cutting greenhouse gas emissions by 78% by 2035, compared to 1990 level, in line with the CCC recommendation. The sixth carbon budget spans from 2033-2037.

In October 2021, government published The Net Zero Strategy: Build back Greener. It is a cross-economy strategy which sets out the measures to keep us on our path to net zero, including the action we will take to keep us on track for meeting carbon budgets and our 2030 Nationally Determined Contribution. The Net Zero Strategy was set to meet the level of decarbonisation that CB6 requires and simultaneously cater to a 40-60% increase in electricity demand. This presents a substantial challenge and could require having to build out all currently known low carbon technologies in the power sector at or close to their maximum technical limits by 2035.

¹⁰⁵ <https://www.gov.uk/government/publications/clean-growth-strategy>

In March 2019 the Government announced its ambition to deliver at least 30 GW of offshore wind by 2030, as part of the Offshore Wind Sector Deal (the 'Sector Deal')¹⁰⁶. The Sector Deal reinforces the aims of the UK's Industrial Strategy and Clean Growth Strategy, which seeks to maximise the advantages for UK industry from the global shift to clean growth, and in particular: 'The deal will drive the transformation of offshore wind generation, making it an integral part of a low-cost, low-carbon, flexible grid system.' Within supplementary documents to the Queens Speech, December 2019¹⁰⁷, Government committed to increase their ambition on offshore wind to 50 GW by 2030. In June 2019 the Government amended the 2008 Act to implement the CCC's recommendation. This made the UK the first major economy to pass laws requiring it to end its contribution to global warming by 2050.

At the end of 2022, UK operational offshore wind capacity was 13.7 GW¹⁰⁸. There is around a further 30GW of projects in earlier stages of development.

The inclusion of a project on a 'future project pipeline' does not indicate that the project will go ahead, or if it does, at a particular generation capacity. It is therefore not the case that government policy will certainly be met by those projects currently under consideration. Within this context, the importance of all offshore wind projects currently under development, to the achievement of Government policy and pledges, is clear. Without the Project, it is possible that delivery of UK Government 2030 ambitions will fall short. In conclusion, offshore wind is recognised as being an important technology for low-carbon generation and the urgent need for large capacities of low-carbon generation is clear to avoid compromising security of electricity supply. Specifically, the Project will be a necessary part of the future generation mix, and as such will make a valuable contribution to meeting the UK Government's achievement of decarbonisation commitments as part of the legally binding target for Net Zero by 2050.

10.3 Conclusion

In line with the precautionary principle, the maximum predicted adverse effects must generally be considered against the need for the Project in the overriding test. In this respect, the ExA noted [ER 13.11.11] that the Applicant generally applied a worst case in the assessments and that the lack of accurate science and the variability of seabird populations and behaviour hindered precision in places in the assessment that was undertaken by the Applicant. Precaution was a major topic throughout the Examination, with the Applicant believing that the approach advocated by the SNCBs was highly over-precautionary. However, the ExA generally accepts the need for the precautionary stance taken by NE and the RSPB, though in some parts, most notably the bespoke approach to the guillemot displacement assessment (Chapter 8 of the ER), it did not believe that applying all 'layers' of precaution were reasonable. In considering whether the reasons for the project to proceed demonstrably outweighed the harm to the site, and the

¹⁰⁶ BEIS (2019). Offshore wind Sector Deal. BEIS Policy Paper, 2019.

¹⁰⁷ HM Government, The Queen's Speech 2019 – background briefing notes.

<https://www.gov.uk/government/publications/queens-speech-december-2019-background-briefing-notes>

¹⁰⁸ https://www.thecrownestate.co.uk/media/4382/11720_owoperationalreport_2022_tp_020523plusaccessibility.pdf

case for IROPI, the ExA therefore adopted what it considered to be the most 'reasonable precautionary position'.

The ExA concluded [ER 13.11.12] that it was in no doubt that there is an immediate need to increase energy supply from renewables for reasons of energy security and as a fundamental contributor to action on climate change. Moreover, offshore wind is an established technology that can be implemented in a defined and deliverable timescale. On the basis of the reasonable precautionary approach that it had adopted in its assessment, the ExA [ER 13.11.13] was of the opinion that IROPI for the Project could be established. However, it considered that the argument for IROPI would be considerably less compelling if considered against the greatest adverse effects predicted by IPs. On balance, the ExA was satisfied that the identified imperative reasons of public interest are sufficient to override the degree of impact that the ExA found for the qualifying features of the Flamborough and Filey Coast SPA.

The ExA recommended [ER 13.11.14] that the IROPI test must be applied by the Secretary of State at the point of decision making as the ExA recognises the possibility that circumstances, external factors such as progress with the applications for the Sheringham and Dudgeon Extension and Rampion 2 Offshore Wind Farms and available evidence may change between the close of the Examination and the decision. The ExA recommended that the IROPI case is reconsidered at that time in the light of the recommendations made in this Report and any further evidence that the Secretary of State considers important and relevant, in particular in understanding the likely magnitude and population implications of adverse effects arising from the Project on the Flamborough and Filey Coast SPA.

The Secretary of State has carefully considered whether IROPI can be established. The Secretary of State agrees with the conclusions of the ExA and is satisfied that there are clear imperative reasons of overriding public interest for the Project to proceed. In arriving at this decision, the Secretary of State has reviewed how the Project provides an essential public benefit that is imperative, despite the harm to the integrity of the Flamborough and Filey Coast SPA.

11 Proposed Compensatory Measures

The Secretary of State, in accordance with Regulation 64, determined that there are no alternative solutions and that the Project must be carried out for imperative reasons of overriding public interest, has considered below the requirements of Regulation 68, which are to provide that any necessary compensatory measures are secured to ensure that the overall coherence of the NSN is protected.

The Applicant's final Compensation Plans were submitted in the Flamborough and Filey Coast SPA Kittiwake Compensation Plan [REP7-019], the Flamborough and Filey Coast SPA Guillemot and Razorbill Compensation Plan [REP7-027], and the Flamborough and Filey Coast SPA Gannet Compensation Plan [REP5-071].

In addition, details of how the plans would be implemented were submitted for artificial nesting structures (ANS), bycatch reduction, predator eradication and fish habitat enhancement ([REP7-023], [REP7-029], [REP7-031] and [REP7-033]).

The Applicant revised its assessment of effects on gannet using a 70% macro avoidance rate and concluded that there would be no AEoI of the Flamborough and Filey Coast SPA as a result of impacts on gannet from the Project alone or in combination and withdrew the without-prejudice compensatory measures for gannet [REP7-017] during the Examination. This conclusion was agreed with NE [REP7-104] and the ExA, but not the RSPB [REP8-005] and [REP8-024].

11.1 Kittiwake

11.1.1 The Applicant's position

At the end of the Examination, the Applicant predicted that the potential collision mortality effect from the Project alone would be 23 kittiwakes. It calculated that approximately 62 additional breeding pairs will be required to compensate for this effect. The Applicant proposed to provide an artificial nesting structure (ANS) to support a breeding population of kittiwake that could produce sufficient breeding adults to compensate for the estimated impact of the Project. The ANS would comprise either the repurposing of an existing oil or gas platform that is due for decommissioning; a new offshore ANS; or a new onshore ANS.

The Applicant's preferred option was to utilise an existing offshore platform (potentially an existing oil and gas structure or similar), and use the foundation to:

- A: Design, construct and install a new topside once the existing topside structure has been removed and decommissioned; and
- B: Repurpose the existing topside structure by adding additional nest sites.

The Applicant identified an opportunity to repurpose the Wenlock Platform which lies 145km off the coast of Humberside. The platform currently supports breeding kittiwake. A Memorandum of Understanding ("MOU") was secured between the Applicant, the owners (Energean UK Limited and Alpha Petroleum Resources Limited) and the operator (Alpha Petroleum Resources Limited) with a view to repurposing this platform. The Applicant proposed to design the topside

specifically for the Wenlock Platform to ensure as many ecological elements of the existing platform are retained in during the repurposing as possible. The Applicant also stated that they had engaged with regulatory bodies regarding the mechanism by which to reclassify the oil and gas platform so that it can be refurbished, operated, maintained and decommissioned.

With regards to a new offshore ANS, the Applicant used a heat mapping process based on a wide range of ecological criteria, as well as technical and commercial parameters to identify broad areas to locate a new ANS¹⁰⁹.

Initial designs for either a new or repurposed offshore ANS comprise a topside which would provide space for approximately 750 nests. The structure would have a vertical back wall and 20 cm wide ledges, with a 50 cm vertical gap between ledges. A vertical dividing wall would be installed between each 30 cm length to provide shelter from the wind and to prevent predators from walking along the ledges. An overhanging roof would be provided at the top of the nesting structure to provide shelter and to deter predators.

For the onshore ANS, the Applicant identified two search areas (Caton Bay to Newbiggin by the Sea and East Suffolk) within the onshore to nearshore environment using a suite of ecological criteria. The structures may be permanent buildings, allowing for internal access for monitoring, or may be prefabricated structures without internal access. The Applicant proposed to refine the site selection, engage with landowners and stakeholders and confirm the location in 2021/2022.

The Applicant is working closely with other developers to find opportunities for collaboration; to consider strategic artificial nesting compensation measures; opportunities for co-location of measures; and to collaborate on evidence gathering and implementation. This could result in the sharing of artificial nesting structures on or offshore.

The Applicant proposed a programme which committed to the implementation of a single structure (repurposed or new) at least three kittiwake breeding seasons ahead of operation. However, it also stated that in the light of the British Energy Security Strategy there is a strong case not to include a specific timescale in the DCO ahead of operation, but rather to simply state that the artificial nesting structures should be in place prior to operation. This approach would remove this issue as an impediment to the faster deployment of offshore wind energy.

The Applicant stated that post-construction monitoring of the ANS would be conducted to record both breeding birds and breeding success. The monitoring results will inform the adaptive management programme and influence any potential maintenance work required on the structure. Adaptive measures will be explored with relevant stakeholders to identify potential approaches within identified parameters, for example:

- extension of the structure to facilitate further nesting spaces;
- additional protection from elements;
- provision of nesting material;
- enhanced recruitment support – kittiwake calls, decoys etc; and
- provision of supplementary food.

¹⁰⁹ Orsted (2021): Hornsea Project Four: Derogation Information. Volume B2, Annex 7.5: Compensation Measures for FFC SPA: Artificial Nesting: Site Selection and Design.

The Applicant would convene a steering group to consult on the implementation of the compensation measures. The steering group would inform the final Kittiwake Compensation Implementation and Monitoring Plan.

In the event that the artificial nesting structure is ineffective in delivering compensation and after all adaptive management options have been exhausted, the Applicant will consult with the steering group with the aim of identifying alternative long-term compensation measures that are securable, deliverable and proportionate to the impact on the kittiwake population of the Flamborough and Filey Coast SPA. Alternatively, the Applicant offered to contribute to a fund such as the Marine Recovery Fund (MRF) to deliver strategic compensation. The MRF forms part of the Offshore Wind Environmental Improvement Package of the BESS.

11.1.2 Position of IPs

The Applicant predicted 23 annual kittiwake collision mortalities from the Project alone. It calculated that approximately 62 additional breeding pairs would be required to compensate for the potential effect. NE stated that a maximum collision estimate of up to 152 adult kittiwake mortalities [REP7-104] should be adopted. NE calculated that 712 nests would be required to compensate for this scale of effect. NE agreed that the provision of 750 nesting sites on the proposed ANS would be sufficient to counter the predicted adverse effects on kittiwake and that this would provide a compensation ratio of 2:1. However, NE raised concerns around the risk and longevity of compensation if only a single structure was provided [REP7-102].

NE highlighted that the availability of nesting habitat had not been proven to be a limiting factor on kittiwake population growth in the southern North Sea. Nevertheless, it advised that the proposed compensation measures would be ecologically feasible [REP7-102] and [REP7-061]. The RSPB and NE agreed that offshore ANSs would be preferable for kittiwake [RR-033].

NE [REP2-082, superseded by AS-028 and AS-029] advised that the provision of onshore ANSs where natural nesting is limited or non-existent would be most likely bolster the kittiwake population to deliver compensation. However, NE remained concerned that there could be insufficient breeding birds to recruit to the ANS, given the high number of artificial nest provision already proposed in the southern North Sea area. Advice from the RSPB [REP7-099], and its final SoCG with the Applicant [REP8-005], aligned with NE's concern around the need for further onshore ANSs.

NE also raised concerns around the effectiveness of the measure in recruiting birds into the population and benefitting the UK NSN [REP7-102].

East Suffolk Council expressed concern around the feasibility of progressing the onshore ANS option post-consent, based on the consenting challenges that it had experienced while working with other wind farm promoters in East Suffolk [REP7-094]

NE confirmed that the ANS should be in place four breeding seasons before the operation of any turbine.

Advice from NE [REP7-102] stressed the importance of monitoring to establish the presence, abundance, and productivity of existing nests on a repurposed structure, and whether an increase on this existing baseline could be demonstrated following repurposing. The Applicant

[REP8-017] confirmed that the ANS would be maintained for the lifetime of the Project and would be monitored for colony size and productivity.

NE [REP7-102] and the RSPB [REP8-024] both expressed concern in relation to the vulnerability of an onshore structure to separate consenting risks following the DCO decision, and that greater certainty would be required on the legal security of compensation measures.

11.1.3 ExA conclusion

The ExA was satisfied that NE's central impact value of 71 annual kittiwake mortalities was the most appropriate value to apply to calculate the quantum of compensation. Using the Applicant's approach [REP1-063], which took account of recruitment age and productivity and survival rates, NE calculated [REP7-102] that this would require 380 nests at a ratio of 2:1.

The ExA was content that an offshore ANS could provide compensation for kittiwake, and that a new or repurposed offshore structure could feasibly be delivered. The ExA was not convinced by the evidence supporting the ecological appropriateness and feasibility of an onshore ANS, based on the commitments and consenting difficulties associated with other offshore wind farm projects.

Risks and uncertainties remain regarding the adoption of a structure by kittiwake; and in securing the proposals, including a satisfactory location and gaining the necessary consents. The ExA is generally content that kittiwake numbers would eventually expand sufficiently to compensate for the predicted adverse effect on the Flamborough and Filey Coast SPA such that the coherence of the UK NSN was ensured.

In addition, the Applicant's commitments to monitoring and adaptive management provide further comfort that the risks could be accommodated and that the adverse effects on the integrity of the Flamborough and Filey Coast SPA kittiwake feature could be adequately compensated.

The ExA considers that the specific circumstances around kittiwake maturity and breeding, and the need for confidence that an ANS compensation measure would be effective prior to the impacts occurring, means that a four-year lead-in time prior to turbine operation is necessary. The ExA notes that this is broadly consistent with the made Orders for the Hornsea Project Three, Norfolk Vanguard and Norfolk Boreas Offshore Wind Farms.

The ExA is content that any ANS could be secured for the lifetime of the Project and would recommend that a detailed requirement was implemented through any future consent application for a programme of appropriate lifetime monitoring of colony size and productivity.

11.1.4 Additional information

On 16th December 2022, the Secretary of State wrote to the Applicant to request additional information on the compensation measures proposed for the kittiwake feature of the Flamborough and Filey Coast SPA. Further information was sought to confirm:

- Confirmation of the location(s) of the ANS, and evidence that the proposed sites can be acquired/leased.
- Details of the ANS design/ adaptations to support kittiwakes and auks, if appropriate.

- An implementation timetable for when the compensation measures will be delivered and when they will achieve their objectives in relation to the commencement of operation of the wind farm.

On the 13th January 2023, the Applicant responded to the Secretary of State's request for further information¹¹⁰. With regards to the location of the ANS: the Applicant referred the Secretary of State to the documents submitted during the Examination and did not provide any further information. The Applicant provided further details on progress made to secure an offshore platform for repurposing, including details of an option to enter into an Asset Transfer Agreement with the current owner and provided a letter provided signed by all parties demonstrating the progress made to date.

The Applicant also confirmed a specific site for the new offshore ANS and confirmed that it had commenced work to secure a Marine Licence for the structure and submitted an Environmental Impact Assessment ("EIA") screening request (reference EIA/2022/00051) to the MMO. Furthermore, the Applicant confirmed that they were engaging with The Crown Estate to secure an AFL and was expecting to receive the draft AFL from The Crown Estate in early 2023.

No further details were provided on securing a site for an onshore ANS.

Further details of the ANS design were provided. The Applicant confirmed that the ANS would constitute a modular, scalable solution comprising of modified offshore shipping style containers, constructed to accommodate bespoke nesting panels and ancillary components. The Applicant confirmed that such a design would require minor modifications to also accommodate breeding guillemot and razorbill.

With regards to the implementation timetable, no further information was provided. The Applicant confirmed that no specific timescale should be included within the DCO, but the ANS should be in place prior to operation; However, if the Secretary of State considers that a lead in time is required, the Applicant has committed to ensure the nesting structure is in place at least three full kittiwake breeding seasons prior to the operation of any turbine.

On the 9th February 2023, the Secretary of State wrote to NE to request that they comment on the additional information. NE were asked to provide comments on the adequacy of the proposed compensation measures to provide effective and deliverable compensation for the impacts of the Project. The Secretary of State also requested that the Applicant, with regards to the proposal to repurpose the Wenlock Platform as an artificial nesting structure (ANS), should confirm: what consents and licences will be required to repurpose the platform and when these will be provided; whether the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) has agreed that this platform can be repurposed as an ANS; and when the required repurposing works would be completed in relation to the first operation of any turbine.

On the 9th March 2023 NE, in response to the Secretary of State's letter, confirmed that its opinion that an onshore ANS was inappropriate remained unchanged. NE confirmed that the measures proposed for kittiwake may be adequate to meet the Project's predicted impacts, but

¹¹⁰ Orsted (13th January 2023): Hornsea Project Four: Applicant's Response to RFI Dated 16th December. Document Reference G9.2. Revision 1.

NE remained concerned about the deliverability and effectiveness of an onshore ANS noting that the refined search area lies in an area of the North Yorkshire coastline where a number of adjacent kittiwake colonies are declining. NE stated that this strongly suggests that an ANS in this location may struggle to produce additional adults. Furthermore, the identified search area is within and/or within view of the North York Moors National Park. Depending on the location and design, an ANS could significantly impact on the statutory purposes of the National Park, making a planning permission challenging to secure.

Furthermore, on the 9th March 2023, the RSPB also provided a response to the additional information in which they referred to the points raised during the Examination [REP6-069] and highlight uncertainty around the ability to secure the relevant licences and other agreements to allow the repurpose an existing offshore platform or to construct a new offshore ANS. Furthermore, no planning or related consents have been obtained, and the exact location of the onshore ANS has not been provided, for evaluation by IPs.

On the 8th March 2023, the Applicant, in response to the Secretary of State's questions around the repurposing of the Wenlock platform, referred to the 'Repurposing Note' submitted during Examination [REP 7-084]. The Applicant confirmed that the current asset operator would apply to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to remove the Wenlock Platform from its Statutory Decommissioning Programme. The Wenlock Platform would then be sold to the Applicant, who would obtain a marine licence for any repurposing works required, and the decommissioning of the Wenlock Platform would then be regulated as a renewable energy installation for the purposes of the Energy Act 2004. Reference to the Wenlock Platform would be removed from the notice issued pursuant to s29 of the Petroleum Act 1998. The Wenlock Platform should be released from the oil and gas regulatory regime, on the basis that it would cease to fall within the definition of an "offshore installation" under the Petroleum Act 1998 because of the repurposing. It would instead become subject only to the renewable energy regulatory regime in a "clean break". The Applicant understood that the asset operator had engaged with OPRED and other stakeholders including the North Sea Transition Authority (NSTA) and Offshore Energies UK (OEUK) to obtain the necessary approvals to remove the Wenlock Platform from the oil and gas licensing regime. The Applicant also stated that it had prepared an Asset Transfer Agreement for the sale of the Wenlock Platform to be shared with the asset owner and operator. The Applicant confirmed that a proposed timetable for delivering the repurposed artificial nesting structure would ensure that the structure is in place at least three full kittiwake breeding seasons prior to operation of any turbine forming part of the Project.

On the 20th March 2023, the Secretary of State wrote to the Applicant to request that they provide an update on securing a Marine Licence from the MMO; and to provide evidence that it had secured an AFL from The Crown Estate to deliver a new offshore ANS.

Furthermore, Alpha Petroleum Resources Limited and Energean UK Limited were invited to comment on the Applicant's Platform Repurposing proposals and specifically provide details of any discussions with the OPRED about whether the Wenlock platform could be repurposed as an ANS.

On 17th April 2023, the Applicant, in response to the Secretary of State's letter of 20th March 2023, confirmed that it had submitted an EIA screening request to the MMO for a new offshore ANS on 15th December 2022: however, the MMO wrote to the Applicant on 14th March 2023

stating that an EIA Screening Opinion could not be determined for the construction and operation of the new offshore ANS or the repurposing of the Wenlock Platform until the DCO Application had been determined. The Applicant also confirmed that it had received a draft Agreement for Lease and draft Lease from The Crown Estate.

The Applicant also submitted a joint statement between the Applicant, Energean UK Limited and Alpha Petroleum Resources Limited, confirming that its updated legal advice was that the current offshore renewables regulatory regime could support the re-use of an offshore oil and gas platform as an artificial nesting structure; and that it had not identified any legal impediment to OPRED agreeing to remove the Wenlock Platform from the Statutory Decommissioning Programme. The Applicant also highlighted that the NSTA has recently updated its strategy and now requires owners of oil and gas infrastructure on the UK Continental Shelf to actively consider re-use options before proceeding with any decommissioning of offshore infrastructure.

The Applicant also stated that OPRED had a number of regulatory, policy and operational concerns to repurposing the Wenlock platform.

11.1.5 The Secretary of State's conclusion

The Secretary of State has reviewed the information provided during the Examination, the additional information provided post-Examination, and the responses of the consultees, with regards to the compensation measures proposed for kittiwake. The Secretary of State is satisfied that the necessary compensatory measures can be secured and delivered to protect the coherence of UK NSN for kittiwake as required by Regulations 29 and 36 of the Offshore Habitats Regulations/ Regulations 64 and 68 of the Habitats Regulations.

11.2 Guillemot

11.2.1 The Applicant's position

The Applicant proposed two measures to compensate for the Project's effects on guillemot: nest predator eradication; and reducing fishing bycatch¹¹¹.

The Applicant committed to convening a steering group (the OOEG) to inform the site selection, implementation, reporting, and other relevant matters of the compensation measures post-consent. The OOEG would also inform the development of the Guillemot Compensation Implementation and Monitoring Plan.

The Applicant's selection of potential sites for the predator eradication measures was based on a range of parameters including: nest site availability, vegetation cover, previous predator eradication attempts, rat presence, guillemot numbers, and historic evidence of guillemot nesting;

¹¹¹GoBe Consultants Limited (August 2022): Hornsea Project Four: Derogation Information. FFC SPA: Guillemot and Razorbill Compensation Plan. Document Reference: B2.8. V.03.

The Applicant identified the following locations where predator eradication would be feasible and beneficial to breeding guillemot:

- Bailiwick of Guernsey:
 - Alderney: A number of islands/ islets around the main island;
 - Herm: Including Herm, The Humps and Jethou; and
 - Sark: A number of islands/ islets around the main island.

During Issue Specific Hearing 12, the Applicant confirmed that their preference would be to focus on the Herm Island complex (Herm, Jethou, including Grand Fauconnière and the Humps (islands and islets within the Ramsar site)), with locations in Alderney providing an adaptive management option.

The Applicant also proposed a range of adaptive management measures to further improve breeding numbers, including:

- providing artificial ground cover at potential cliff-top breeding sites to deter avian predators;
- using playbacks, decoys, and white paint to simulate guano at potential breeding sites to increase the likelihood of recruitment; and
- removing vegetation that provides habitat for rats.

Furthermore, the Applicant proposed that at the initiation of the predator eradication program, biosecurity measures would be put in place to prevent re-infestation by the target predator, or the arrival of other non-native mammalian predator species.

The Applicant committed to monitoring predators for at least two years after the baiting or trapping campaign, to record the removal of target species from the location. Monitoring for potential re-infestation will continue for the operational phase of the project. Guillemot productivity will also be monitored for the operational phase of the Project.

The Applicant committed to the predator eradication measures being implemented two years prior to operation¹¹².

The Applicant proposed to enter into voluntary access agreements with landowners and occupiers in order to gain access to their land both for implementing the compensation measure and for ongoing monitoring through the lifetime of the Project. Generally, the Applicant will seek:

- Licence agreements from landowners to enable equipment to be installed and maintained on third party land for the duration of the Project.
- The agreements will also contain rights of access to any equipment left in situ, allowing for maintenance and monitoring visits.

The Applicant also stated that it may be necessary to put in place biosecurity measures. This may include leasing land for long-term monitoring stations. In which case, the Applicant will be seeking:

- An initial option agreement that grants the Applicant exclusivity over a specified area of land for a set period with the ability to call on the landowner to permit a monitoring station to be installed.

¹¹² Orsted (2022): Hornsea Project Four: Compensation Measures for FFC SPA: Predator Eradication: Roadmap.

- The grant of a long leasehold interest; and
- Rights of access and if needed the installation of service media.

Furthermore, the Applicant may require a commercial arrangement with vessel and/or flight operators to ensure suitable biosecurity measures can be implemented¹¹².

The Applicant provided letters of comfort from the Alderney Wildlife Trust and the States of Guernsey. The Applicant also stated that an MoU was also agreed by the States of Guernsey (dated 10th June 2022) providing a framework to ensure support and long-term security of the compensation measure: however, this was not presented during the Examination. The Applicant also stated that a separate draft MoU was under discussion with another relevant party.

The Applicant also confirmed that a number of other assessments, consents and permissions may be required to implement the predator eradication measures, including the following:

- A Habitats Regulation Assessment of the compensation measures on SACs, SPAs and Ramsars.
- A Site of Special Scientific Interest (SSSI) notification (if required) will include a list of operations likely to damage the features for which the site is regarded as special. Section 28G of the Wildlife and Countryside Act 1981 (the 1981 Act) confers duties on “section 28G authorities”. The Applicant holds a Generation Licence pursuant to s6 of the Electricity Act 1989 which means the Applicant is a statutory undertaker and falls within section 28G. The 1981 Act requires the Applicant to take certain steps to notify the relevant statutory nature conservation body of the works.
- Consents from either the Health and Safety Executive or the Department for the Environment, Food and Rural Affairs depending upon the bait type and delivery method used.
- For Ramsar sites, necessary permissions will be required (such as from States of Alderney Estates Environment and Infrastructure or The States of Guernsey Agriculture, Countryside and Land Management Service and Veterinary Officer).
- The States of Guernsey and States of Alderney are crown dependencies and therefore possessions of the UK Crown, but the land including the islets and islands is administered by the States. The Applicant has been liaising with the States of Guernsey (and an MoU dated 10th June 2022 has been agreed) and with local tenants to undertake the implementation study. Permission has been granted to undertake the implementation study by States of Guernsey and tenants, including permission from the States of Guernsey Veterinary Officer required due to the Ramsar site designation protection.

The Applicant was confident the necessary permissions and consents could be secured.

The Applicant proposed to reduce fishing bycatch of guillemot in UK waters using Looming Eye Buoy (LEB) technology to deter birds from gillnets. The approach taken to the delivery of bycatch reduction will be discussed with the OOEG as part of the development of the GCIMP and the effectiveness of the bycatch reduction measures will be monitored for the operational phase of the Project.

The Applicant has also proposed to produce an adaptive management plan which will be outlined in the GCIMP. If the bycatch mitigation technique proves to be unsuccessful, another technique or fishery type may be chosen for bycatch reduction in consultation with the OOEG.

The Applicant proposed to contribute to the MRF which forms part of the Offshore Wind Environmental Improvement Package of the BESS, as an alternative compensation measure. The Applicant has also included draft DCO wording confirming that the implementation plans must also include the purpose of the contribution (i.e., as an alternative to the delivery of a specific compensation measure or as an adaptive management measure) and the amount and timing of the contribution.

11.2.2 Position of IPs

Both NE and the RSPB submitted advice throughout the Examination that insufficient evidence had been provided that the proposal compensation would result in a demonstrable benefit to the UK NSN.

The SoCG between the Applicant and NE [REP7-061] identified that, whilst technically feasible, NE did not agree that the proposal had merit for guillemot or that evidence existed for efficacy and sufficient benefit to address the predicted adverse effects on the Flamborough and Filey Coast SPA.

The RSPB identified information it considered necessary for the Applicant to submit to the Secretary of State before reliance was placed on the predator eradication proposals as compensation [REP6-069, Table 3].

With regards to the predator eradication measure, both NE and the RSPB advised that the proposals remained uncertain in terms of location, scale, effectiveness, and feasibility in respect of their ability to ensure the coherence of the UK NSN. Furthermore, in the final SoCG between the Applicant and NE [REP7-061], the efficacy of bycatch reduction and its suitability as a compensation measure remained not agreed. The final SoCG between the Applicant and the RSPB [REP8-005] noted the RSPB's view that bycatch reduction was not supported by adequate evidence that it could be of benefit to the target species of the Flamborough and Filey Coast SPA. The RSPB [REP6-069] submitted advice on the further actions that could, in its view, be taken to increase confidence in this as a compensatory measure.

11.2.3 ExA conclusion

The ExA recognised that predator control could benefit auk populations where there is evidence that predator pressure is a factor limiting auk nesting.

The ExA was content that, subject to satisfactory progress to formal agreement, the scheme could be implemented in the Bailiwick of Guernsey. However, the ExA considers there to be material doubts that this location would offer ecological connectivity with the relevant UK auk flocks and that compensation implemented here would adequately protect the coherence of the UK NSN.

The ExA also had concerns about the feasibility of using LEBs as a compensation measure for auks. The ExA suggested that the Secretary of State would require considerable additional evidence to demonstrate its effectiveness and to prove benefits to the target auk flocks from the Flamborough and Filey Coast SPA. Furthermore, the Secretary of State would need to be satisfied that the measure would be in addition to any existing and forthcoming policy and legislative commitments in relation to the reduction of commercial fishing bycatch.

11.2.4 Additional information

On 16th December 2022, the Secretary of State wrote to the Applicant to request additional information on the compensation measures proposed for the guillemot feature of the Flamborough and Filey Coast SPA:

For the predator eradication strategy, the following information was requested:

- Confirmation of the location(s) proposed for the predator eradication, and evidence that the necessary permissions to undertake the measures could be obtained at the location(s).
- Evidence that nest predation is a significant limiting factor in the breeding success of auk species at the proposed location(s).
- Evidence that the auk populations in the proposed location(s) are functionally linked to the populations at Flamborough and Filey Coast SPA.
- If the proposed location(s) is outside of the jurisdiction of the UK, evidence that any made Order could adequately secure management of the site.

For the bycatch reduction strategy, the following information was requested:

- Evidence that the use of LEBs would significantly reduce the bycatch of auks from the Flamborough and Filey Coast SPA.
- Details of how the proposed measures will be secured for the lifetime of the project.
- Evidence that the proposed measures will be in addition to any bycatch reduction measured required by UK policy or legislation.

On the 13th January 2023, the Applicant responded to the Secretary of State's request for further information⁹⁵. With regards to the predator eradication measures, the Applicant referred the Secretary of State to the documents submitted during the Examination and did not provide additional information.

With regards to the bycatch reduction measures, the Applicant referred the Secretary of State to the documents submitted during the Examination for evidence of the efficacy of LEBs to reduce auk bycatch; and details of how the measures would be secured. With regards to ensuring that the LEB measures were in addition to those required by UK policy or legislation, the Applicant stated that whilst general policy and legislation includes ambitions to reduce seabird bycatch, no policies or legislation that enforces the reduction of seabird bycatch in a manner which overlaps with the Applicant's proposals, had been identified.

On 9th February 2023, the Secretary of State asked NE to provide comments on the adequacy of the proposed compensation measures to provide effective and deliverable compensation for the impacts of the Project. The Secretary of State also requested that the Applicant, with regards to securing compensation sites for the predator eradication programme, provide the MOU agreed by the States of Guernsey and the Alderney Wildlife Trusts.

On the 9th March 2023, NE responded to the Secretary of States request for comments and confirmed that its position at the end of Examination on the adequacy of the compensatory measures remained unchanged.

NE also confirmed that there remained a high degree of uncertainty regarding both the deliverability and scalability of the measures proposed for auks. During the Examination, NE advised that compensation measures should be

judged against their ability to compensate for 1,131 guillemot adult mortalities per year, but the information provided predicts that the maximum predicted benefit from Herm (the primary location for eradication) is nest space for ~318 pairs of guillemot, and 200 of these spaces are located at The Humps, where it is not currently known whether any rats are present. Were there to be no rats in this location, it would reduce the potential primary offer to ~118 pairs. Even if nest space for ~318 pairs of guillemot could be created, the expected productivity falls far short of the predicted impacts, with the benefit to the UK NSN likely to be considerably diluted compared to gains achieved on the Channel Islands. Similarly, NE stated that there was significant uncertainty regarding the bycatch reduction measures.

On 9th March, the RSPB provided its response on the adequacy of the compensation measures, stating that ‘there has been no substantive progress since the close of the Examination’. With regard to the effectiveness of LEBs, the RSPB referred to a recent study undertaken by RSPB and Fuglavernd - BirdLife Iceland (ISPB), which tested the effects of LEBs at reducing bycatch in the Icelandic lumpfish fishery. Whilst acknowledging that the nature of this fishery and its operative conditions are different to gillnet fisheries operating in UK waters, the results suggested an absence of effect in terms of seabird bycatch mitigation for common and black guillemots.

On 8th March 2023, the Applicant submitted the requested MOU with the States of Guernsey, and the MOU with Alderney Wildlife Trust.

On the 20th March 2023, the Secretary of State invited NE and the RSPB to comment on the further information on the predator eradication programme provided by the Applicant on 8th March 2023.

On 17th April 2023, NE confirmed that it welcomed that MOUs between the Applicant and the States of Guernsey and Alderney Wildlife Trust, but it’s concerns around the predator eradication programme remained.

On 17th April 2023, RSPB confirmed that it had reviewed the MOUs between the Applicant and the States of Guernsey and Alderney Wildlife Trust; however, as it did not present any new or substantive information beyond that already considered at the Examination, its position on the proposed predator eradication compensation measure remained as set out during the examination and in our 9th March 2023 submission.

On 19th May 2023, the Secretary of State invited final comments on the additional information provided to date.

On 16th June 2023 NE stated that, with regards to the compensation measures for guillemot, in their view there would be a shortfall between the predicted level of impact and the scale of compensation likely to be achievable by the measures, and they advised that both compensation (bycatch reduction and predator eradication) would need to be delivered as a package. They also considered that to increase the likelihood of the predator eradication providing meaningful measures, all the islands preliminarily identified by the Applicant should be subject to eradication efforts, rather than ‘holding back’ some islands for adaptive management.

11.2.5 The Secretary of State's conclusion

The Secretary of State has reviewed the information provided during the examination, the additional information provided post-Examination, and the responses of the consultees, with regards to the compensation measures proposed for guillemot.

The Secretary of State notes that NE advised that compensation measures should be judged against their ability to compensate for 1,131 guillemot per year, however he agrees with the ExA and has judged the measures against their ability to compensate for 452 guillemot per year. The Secretary of State notes the ExA's concerns that the predator control measures would not adequately protect the coherence of the UK NSN for guillemot. He also notes NE's concern that the number of nest sites that could be created by removing predators from the compensation sites would not be sufficient to compensate for the number of birds predicted to be killed by the Project. The Secretary of State also notes the ExA's concerns regarding the effectiveness of LEBs as a compensation measure for guillemot.

The Applicant has undertaken an extensive literature review and provided evidence that the mammalian predator eradication has benefited guillemot populations in other locations. He notes that the Lundy Seabird Recovery Project, which was undertaken in 2001, resulted in a significant increase in guillemot numbers after rats were eradicated. The Secretary of State also notes that the Applicant has undertaken surveys of the islands within the Bailiwick of Guernsey and identified the presence of brown and/ or black rat in some locations. Furthermore, the Applicant identified areas of potentially suitable nesting habitat that are currently unoccupied, which may indicate that rats are preventing guillemot from nesting in these locations. The Secretary of State considers that the Applicants supporting evidence (Guillemot and Razorbill Compensation Plan [REP5-026], Predator Eradication Ecological Evidence [APP-196] and Predator Eradication Roadmap [REP5-030]) demonstrates that the measure has some merit and has potential to be effective in compensating for impacts to guillemot.

The Secretary of State notes that the Applicant [REP8-017] maintained that, should the proposed predator eradication compensation be required, it would be sufficiently 'scalable' to address the greater adverse effects predicted under the parameters advocated by NE. However, it noted that the ability to increase the scale of the compensation was dependent on revisiting its less-progressed 'long-list' of island options for delivery. In their consultation response (dated 16th June 2023) NE advised that, should the Project proceed, both compensation measures (bycatch reduction and predator eradication) would need to be delivered as a package. They also considered that to increase the likelihood of the predator eradication providing meaningful compensation, all the islands preliminarily identified by the Applicant should be subject to eradication efforts, rather than 'holding back' some islands for adaptive management. NE, in their *End of Examination Position on the Applicant's Proposed Compensatory Measures* [REP6-057] advice also stated that there would be merit in exploring the use of ANS for guillemot as either an initial measure, or an adaptive management option.

The Secretary of State agrees with NE's advice on improving the efficacy of the predator eradication measures and the potential of ANS to provide compensation for guillemot and considers that these measures could be secured within the DCO.

He also takes comfort that adaptive management measures have been proposed and that should the rat eradication measures in the islands within the Bailiwick of Guernsey fail to produce

sufficient numbers of adult guillemot to compensate for the Project's effects, then these measures could be implemented in other locations by revisiting its less-progressed 'long-list' of island options for delivery.

During Examination, concerns were raised that the proposed predator eradication sites lay outside the jurisdiction of the UK Government and regulators. In February 2023, the Applicant provided a MoU between the States of Guernsey (dated 10th June 2022) and the Alderney Wildlife Trust (dated 20th December 2022) which provided a framework to ensure support and long-term security of the compensation measure. The Secretary of State is reassured that the eradication programme can be delivered at the proposed locations.

Furthermore, the Secretary of State notes NE's concerns regarding the connectivity between the proposed compensation sites and the UK NSN. However, the Secretary of State notes that in report G3.4.1 Compensation measures for FFC SPA: Ecological Connectivity of Compensation Measures Annex 1 [REP3-034], the Applicant presents evidence that guillemot originating from North Sea colonies are likely to migrate through or disperse the waters in the English Channel and Channel Islands. The Secretary of State is therefore comfortable that there is sufficient evidence of connectivity between the Bailiwick of Guernsey and the UK NSN.

With regards to NE's concerns around the effectiveness of LEBs in reducing bycatch [REP2-082]⁴, the Secretary of State is aware that a research study undertaken by the Applicant into bycatch mitigation using LEBs in 22 fishing enterprises, concluded that the technology was effective in reducing guillemot bycatch [REP8-017]. He also notes that NE supported the LEB trial and agreed its theoretical merit [REP7-061] and acknowledged that further work may yield adequate information on efficacy in the post-consent period [REP7-102]. The Secretary of State considers that the Applicants supporting evidence (Guillemot and Razorbill Compensation Plan [REP5-026], Bycatch Reduction Ecological Evidence [APP-194], Bycatch Reduction Roadmap [REP5-028] and Bycatch Reduction Technology Selection Phase Summary [REP5-068]) demonstrates that this measure is technically feasible and deliverable. Having reviewed the responses to the consultation letters, the Secretary of State is content that the LEB measure is likely to be additional to the normal/ standard measures required for the designation, protection and management of protected sites under the Habitats Regulations.

The Secretary of State notes that NE welcomes the commitment that both predator eradication and bycatch measures will be delivered as a package, and he considers that this increases the confidence that the measures will be effective in compensating for the impacts to guillemot. The Secretary of State concludes that it is possible to secure a package of measures that would provide compensation for the effects of the Project on guillemot and ensure the overall coherence of the UK NSN.

11.3 Secondary measures

11.3.1 The Applicant's position

The Applicant proposed fish habitat restoration as a secondary measure to support the primary compensation measures for kittiwake and guillemot. The habitat restored (namely, seagrass) would support several fish species which kittiwake and guillemot eat.

The Applicant had commenced seagrass restoration trials at Spurn Point in the Humber Estuary with support from the Yorkshire Wildlife Trust (YWT). Surveys are being undertaken by the University of Hull to demonstrate the connectivity of seagrass in the Humber Estuary with kittiwake prey found in the North Sea. Further areas for seagrass restoration, if needed for adaptive management, are also being considered.

11.3.2 The Position of IPs

At the end of the Examination NE [REP7-102] expressed support for the sea grass measure in broad terms, but advised that it could not be considered compensation, either in itself or as a supporting measure because of the absence of an evidenced link to a measurable benefit to the target seabird species and the experimental nature of the restoration process. In its SoCG with the Applicant [REP8-005], the RSPB echoed NE's position.

11.3.3 ExA conclusion

Whilst recognising the benefits of seagrass bed restoration for general marine biodiversity, the ExA did not consider that there was sufficient evidence that it would provide effective compensation for the features effected by the Project.

11.3.4 The Secretary of State's conclusion

The Secretary of State, in agreement with the ExA, concludes that whilst the restoration of seagrass beds would benefit marine biodiversity, there is currently insufficient evidence that it would directly benefit the effected features of the Flamborough and Filey Coast SPA and maintain the coherence of the UK NSN for these species.

11.4 Strategic compensation

The Applicant [REP5-086] suggested it could contribute to the MRF as a strategic alternative to the proposed and without-prejudice practical compensation measures and any adaptive management measures [REP7-015], [REP7-019] and [REP7-029]. The option to adopt the strategic compensation proposed was secured through Schedule 16 of the final draft DCO [REP7-039] and the Applicant's alternative, without-prejudice Schedule 16 [REP7-079].

11.4.1 Position of IPs

NE [RR-029] and [REP7-102], the RSPB [REP8-024] and The Wildlife Trusts [RR-039] expressed support for strategic compensatory measures, but stated that they must deliver a benefit to impacted features and that measures to improve prey resources were most likely to offer success.

The RSPB [REP7-099] and [REP8-024] did not agree with the Applicant that the, yet to be legislated and implemented MRF, could be relied upon. It considered the assumption that measures would be available from the end of 2023 to be unrealistic considering the work required to establish the benefit to the impacted species.

11.4.2 ExA conclusion

The ExA recognised the commitments in relation to strategic compensation set out by the Applicant and is satisfied that Schedule 16 of both the recommended DCO [REP7-039] and the alternative, without-prejudice Schedule 16 [REP7-079] make adequate provision to secure those commitments and the further work required to agree the detail of measures for both compensation and adaptive management.

The ExA notes that the implementation of the MRF is set out in current policy: however, neither the MRF nor any other appropriate vehicle for strategic compensation was in place at the end of the Examination.

The ExA also noted that the details of the strategic compensation in terms of locations, design, any necessary consents, timescales, and mechanism of implementation are as yet unknown, and advised that the Secretary of State would need to be satisfied that this work could be in place at an appropriate juncture to compensate for the predicted AEoI of the Flamborough and Filey Coast SPA. If all such details could be finalised and secured, the ExA would be content that in-principle, strategic compensation as proposed could ensure the overall coherence of the UK NSN.

11.4.3 The Secretary of State's conclusion

The Secretary of State, in agreement with the ExA, concludes that because the MRF is not yet in place, it cannot be relied upon to provide compensation for the effected features of the Flamborough and Filey Coast SPA, and its role in maintaining the coherence of the UK NSN for these species cannot be secured.

11.5 HRA of compensatory measures

The Applicant submitted a HRA for those compensatory measures that could affect protected sites [APP-179] and [APP-180]. The Applicant concluded that there would be no AEoI of any UK NSN sites as a result of the implementation of the compensatory measures.

The Applicant stated that the development consent for any compensatory measures was not sought through the DCO, and any EIAs or HRAs required for these measures would form part of a separate consenting processes. Furthermore, it considered that a final assessment of in-combination effects would not be possible until the compensatory measures had been further refined [REP7-015].

In response to the Secretary of State's first information request, the Applicant stated¹¹³ that it had 'commenced work to secure a Marine Licence' and had applied to the MMO for an EIA Screening (reference EIA/2022/00051) for the proposed new ANS. In his fourth consultation

¹¹³<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002233-G9.1%20Applicant's%20Cover%20Letter%20in%20Response%20to%20RFI%20dated%2016%20Decemb er.pdf>

letter, the Secretary of State asked the Applicant to provide an update on securing a Marine Licence from the MMO. The Applicant¹¹⁴ responded that it had received a letter (Appendix A) from the MMO on 15th March 2023 which stated that an EIA Screening Opinion cannot be determined for the construction and operation of the new offshore ANS until the Application has been determined. The letter advises that this will also apply to any screening request submitted prior to DCO decision for the repurposing of the Wenlock platform. The Applicant will therefore have the Marine Licence application(s) prepared and ready to submit subject to a positive DCO decision.

The Secretary of State notes that Regulation 67 (2) of the Habitats Regulations and Regulation 35 (2) of the Offshore Habitats Regulations states that: *“Nothing in regulation 63(1) [Offshore Habitats Regulations 28(1)] or 65(2) [Offshore Habitats Regulations 33(3)] requires a competent authority to assess any implications of a plan or project which would be more appropriately assessed under that provision by another competent authority.”* He also notes that determination of LSE regarding the Offshore ANS’s will occur under the separate Marine Licence consenting process, for which the MMO will be the Competent Authority, and under the application for planning permission for the onshore ANS, for which the LPA would be the competent authority.

11.5.1 ExA conclusion

The ExA was satisfied that no evidence was presented during Examination that demonstrated that the proposed compensatory measures could not be delivered as a consequence of adverse effects on any UK NSN site, but it recommended that the Secretary of State and any other relevant Competent Authority should consider the need for additional assessments prior to determining any further consent application for physical compensation measures.

11.5.2 The Secretary of State’s conclusion

The Secretary of State notes that there are separate and subsequent consenting regimes in place for such measures and that the Applicant’s has engaged to begin securing consent for these.

The Secretary of State is also satisfied that, if the HRA compensatory measures themselves were not to be consented by other authorities due to the outcomes of subsequent HRA assessments or otherwise, then the DCO secures that the construction of the Project cannot commence.

¹¹⁴<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002270-G12.1%20Applicant's%20Response%20Letter%20to%20RFI%20dated%2020%20March%202023.pdf>

12 HRA conclusion

The Secretary of State concludes that an AEoI of the Flamborough and Filey Coast SPA cannot be excluded due to impacts on the kittiwake and guillemot populations from the Project, in combination with other projects, and he has invoked the derogation tests.

The Secretary of State is satisfied that there are no alternative solutions to fulfilling the objectives of the Project that would remove the AEoI of the Flamborough and Filey Coast SPA. The Secretary of State is also satisfied that the established imperative reasons of public interest provided by the Project would outweigh the impacts to the Flamborough and Filey Coast SPA.

The Secretary of State is satisfied that a package of compensatory measures to ensure that the overall coherence of the UK NSN can be secured with regards to The Flamborough and Filey Coast SPA kittiwake and guillemot features. The Secretary of State notes the concerns of IPs and the ExA regarding the effectiveness of the proposed compensation measures for guillemot; however, he has reviewed the information provided by the Applicant and is confident that, along with the monitoring and adaptive measures that have been proposed, it should be possible for these measures to compensate for the effects of the Project. To provide further reassurance, there are conditions within the DCO to ensure that the measures must be commenced at least 2 years before construction of the turbines begins, rather than before turbine operation as suggested by the Applicant, to provide an extended period for the measures to take effect.

12.1 Kittiwake compensation

With regards to the kittiwake feature of the Flamborough and Filey Coast SPA. The Secretary of State is satisfied that appropriate compensation measures have been identified to offset the loss of 43.1 birds per year, and that these measures can be secured in the DCO.

The Secretary of State concludes that compensation should be provided via a new offshore artificial nesting structure, and this should be delivered in accordance with the principles set out in the Kittiwake Compensation Plan.

The following measures can be secured as conditions of the DCO:

- A Hornsea 4 Offshore Ornithology Engagement Group (H4 OOEG) must be established, and the following details must be approved by the Secretary of State prior to the commencement of the authorised project:
 - i. The Terms of Reference of the H4 OOEG.
 - ii. The membership of the H4 OOEG, including an independent chair.
 - iii. The schedule for meetings; the reporting and review periods; and the timetable for production of the Kittiwake Compensation and Implementation and Monitoring Plan (KCIMP).
 - iv. The dispute resolution mechanism.

- A KCIMP must be developed by the Applicant in consultation with the H4 OOEG. The KCIMP must deliver the strategy set out in the Kittiwake Compensation Plan and be submitted to the Secretary of State for approval (in consultation with the H4 OOEG) within sufficient time to provide the agreed compensation measures four full breeding seasons before the operation of the first wind farm generator (see iv below). The KCIMP must include the following details:
 - i. Details of the location where the compensation measure will be delivered and the suitability of the site to deliver the measures (including why the location is appropriate ecologically and likely to support successful compensation);
 - ii. In relation to an offshore structure, details of any relevant seabed agreement(s);
 - iii. Details of the design of the artificial nesting structure(s) to provide nesting for at least 750 pairs of kittiwake in total; including the projected number of nests that will be accommodated on the structure, and how risks from predation or other perturbations have been designed out or mitigated;
 - iv. An implementation timetable for delivery of the artificial nesting structure, such timetable to ensure that the structure is in place to allow for at least four full kittiwake breeding seasons prior to operation of any turbine forming part of the authorised development. For the purposes of this paragraph each breeding season is assumed to have commenced on 1st April in each year and ended on 30th September;
 - v. Details of the maintenance schedule for the artificial nesting structure;
 - vi. Details for the proposed ongoing monitoring and reporting of the effectiveness of the measures including:
 - 1. Survey methods.
 - 2. Survey programmes.
 - 3. Success criteria.
 - 4. Timescales for the monitoring reports to be delivered.
 - 5. Recording of H4 OOEG consultations and project reviews.
 - vii. Details of any adaptive management measures, with details of the factors used to trigger any alternative and/or adaptive management measures; and
 - viii. Monitoring should include annual monitoring of the number of birds colonising the site including sufficient detail to identify barriers to breeding success (including nesting attempts and nest productivity) and target alternative or adaptive compensation measures. Evidence of natal dispersal and colony interchange with the UK NSN and FFC kittiwake colony should be included. Information of any other seabirds attempting to and/ or successfully nesting on the ANS should also be recorded.
- The undertaker must implement the measures set out in the KCIMP approved by the Secretary of State, unless otherwise agreed by the Secretary of State in consultation with the relevant SNCB and the MMO for offshore measures, and with the SNCB and the relevant local planning authority for any onshore measure (if such a measure is required). In particular, no operation of any turbine forming part of the authorised development may begin until the KCIMP has been approved by the Secretary of State and until four full breeding seasons following the implementation of the measures set out in the KCIMP have

elapsed. For the purposes of this paragraph each breeding season is assumed to have commenced on 1 April in each year and ended on 30 September.

- The undertaker must notify the Secretary of State of completion of construction of the artificial nesting structure as set out in the KCIMP.
- Results from the monitoring scheme must be submitted at least annually to the Secretary of State and the relevant SNCB. This must include any finding that the measures have been ineffective in securing an increase in the number of adult kittiwakes available to recruit into the UK NSN, and in such cases proposals to address this. Any proposals to address effectiveness must thereafter be implemented by the undertaker as approved in writing by the Secretary of State in consultation with the relevant SNCB.
- The artificial nesting structure must not be decommissioned without prior written approval of the Secretary of State in consultation with relevant SNCB. The artificial nest structures shall be maintained beyond the operational lifetime of the authorised development if they are colonised, and routine and adaptive management measures and monitoring must continue whilst the artificial nesting structures are in place.
- The KCIMP approved under this Schedule includes any amendments that may subsequently be approved in writing by the Secretary of State. Any amendments to or variations of the approved KCIMP must be in accordance with the principles set out in the Kittiwake Compensation Plan and may only be approved where it has been demonstrated to the satisfaction of the Secretary of State that it is unlikely to give rise to any materially new or materially different environmental effects from those considered in the kittiwake compensation plan.
- In the event of any conflict between the terms of the Order and the Kittiwake Compensation Plan or the KCIMP then the provisions of the Order shall prevail.

12.2 Guillemot compensation

The Applicant has proposed a package of compensation measures to maintain the overall coherence of the UK NSN for guillemot. The Secretary of State agrees that the compensation should recruit 452.3 adult guillemot into the UK NSN per year. The compensation package should include predator eradication and bycatch reduction measures in accordance with the principles set out in the Guillemot and Razorbill Compensation Plan⁹⁷.

Furthermore, to increase the likelihood of the measures being effective, the predator eradication measures should be taken forward at all identified sites within the Herm Island complex (Herm, Jethou, including Grand Fauconnière and the Humps) and locations around Alderney as a primary measure.

The following measures can be secured as conditions of the DCO:

- A H4 OOEG must be established, and the following details must be approved by the Secretary of State prior to the commencement of the authorised project:
 - i. The Terms of Reference of the H4 OOEG.

- ii. The membership of the H4 OOEG, including an independent chair.
 - iii. The schedule for meetings; reporting and review periods; and the timetable for production of the Guillemot Compensation and Implementation and Monitoring Plan (GCIMP).
 - iv. The dispute resolution mechanism.
- A GCIMP must be developed by the Applicant in consultation with H4 OOEG to deliver the strategy set out in the Guillemot and Razorbill Compensation Measures Plan (as they relate to guillemot). The GCIMP must be submitted to the Secretary of State for approval (in consultation with the H4 OOEG and the relevant landowners and Planning Authorities). The GCIMP must include the following details:

For the predator eradication measure:

- i. Details of the location(s) where the compensation measure will be delivered;
- ii. Details of the number of nest sites that need to be created. This must take into account both the number of chicks that need to be produced to ensure that the required number survive to adulthood; and the proportion of the adult birds that are expected to be recruited into the UK NSN;
- iii. Details of how any necessary land access rights, licences and approvals have or will be obtained and any biosecurity measures will be or have been secured;
- iv. An implementation timetable for delivery of the predator eradication measure, to ensure that the predator eradication measures have commenced no later than two years prior to the commencement of Work No. 1(a) and 1(b), Work No. 2(a), 2(b) and 2(c) and Work No. 3(a);
- v. Details for the proposed ongoing monitoring of the measure including:
 - 1. Survey methods for predators and seabirds.
 - 2. Success criteria.
 - 3. Survey and reporting programmes.
 - 4. Seabird productivity rates.
 - 5. Seabird breeding population.
 - 6. Distribution of breeding birds.
 - 7. Evidence of guillemot natal dispersal to the UK NSN.
- vi. Recording of H4 OOEG consultations and project reviews;
- vii. Details of any adaptive management measures and details of the factors used to trigger such measures. Such measures should consider offshore ANS for guillemot; and
- viii. Provision for reporting to the Secretary of State, to include details of the use of the location(s) by breeding guillemot to identify barriers to success and target any adaptive management measures.

For the bycatch reduction measure:

- i. Details of relevant technology supply agreements and arrangements with fishers to use the bycatch reduction technology that will be or have been secured by the undertaker;
- ii. The locations where the measures will be deployed and the number of fishing vessels to be included in the scheme;

- iii. An implementation timetable for provision of the bycatch reduction measure, such timetable to ensure that contract(s) are entered into with fishers for the provision and use of bycatch reduction technology no later than one year prior to the commencement of Work No. 1(a) and 1(b), Work No. 2(a), 2(b) and 2(c) and Work No. 3(a);
- iv. Details for the proposed ongoing monitoring of the measure including collection of data from participating fishers;
- v. The success criteria, defined as the estimated reduction in the number of guillemot killed.
- vi. Recording of H4 OOEG consultations and project reviews;
- vii. Details of any adaptive management measures, and details of the factors used to trigger any such measures; and
- viii. Provision for annual reporting to the Secretary of State, to identify barriers to success and target the adaptive management measures.

The undertaker must carry out the predator eradication method and enter into contract(s) with fishers for the provision and use of bycatch reduction technology as set out in the GCIMP approved by the Secretary of State in consultation with NE, the Alderney Wildlife Trust and the relevant planning authority for the onshore measures and the relevant SNCB and MMO for the offshore measures. In particular, Work No. 1(a) and 1(b), Work No. 2(a), 2(b) and (c) and Work No. 3(a) must not commence until the GCIMP has been approved by the Secretary of State, and at least 2 years have elapsed since the start of the predator eradication works and at least one year after the contract(s) with fishers for the provision and use of bycatch reduction technology have been entered into.

The undertaker must notify the Secretary of State of completion of the predator eradication method and entering into contract(s) with fishers for the provision and use of bycatch reduction technology set out in the GCIMP.

The GRCIMP approved under this Schedule includes any amendments that may subsequently be approved in writing by the Secretary of State. Any amendments to or variations of the approved GRCIMP must be in accordance with the principles set out in the guillemot and razorbill compensation plan and may only be approved where it has been demonstrated to the satisfaction of the Secretary of State that it is unlikely to give rise to any materially new or materially different environmental effects from those considered in the guillemot and razorbill compensation plan (as relevant to guillemot).