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Record of the Habitats Regulations Assessment

Undertaken under Regulation 63 of The Conservation of Habitats and Species Regulations 2017 and Regulation 28 of The Conservation of Offshore Marine Habitats and Species Regulations 2017

Table of Contents

1. Summary of the Conclusions of the Assessment	6
2. Introduction.....	6
2.1. Background.....	6
2.2. Habitats Regulations Assessment (HRA)	7
3. Screening.....	11
3.1. The Likely Significant Effects Test.....	11
3.2. Screening – Identification of Likely Significant Effects	11
4. Appropriate Assessment.....	12
4.1. Test for Adverse Effect on Site Integrity	12
4.2. RIAA Methodology	13
4.3. In Combination Assessment	14
4.4. Uncertainties	14
5. Assessment Findings	16
5.2. Annex I Habitats	16
5.2.1. Dogger Bank SAC	16
5.2.2. North Norfolk Sandbanks and Saturn Reef SAC	17
5.2.3. Shell Flat and Lune Deep SAC.....	18
5.3. Annex II Species.....	18
5.3.1. Afon Eden – Cors Goch Trawsfynydd SAC.....	18
5.3.2. Afon Gwyfai a Llyn Cwellyn SAC	19
5.3.3. Afon Teifi/River Teifi SAC.....	19
5.3.4. Berriedale and Langwell Waters SAC.....	20
5.3.5. Bristol Channel Approaches SAC	20
5.3.6. Cardigan Bay/Bae SAC	21
5.3.7. Cladagh (Swanlinbar) River SAC	22
5.3.8. Dee Estuary/Aber Dyfrdwy SAC	22
5.3.9. Humber Estuary SAC	22

5.3.10.	Lough Melvin SAC	23
5.3.11.	North Anglesey Marine/Gogledd Môn Forol SAC	24
5.3.12.	North Channel SAC.....	24
5.3.13.	Owenkillew River SAC	25
5.3.14.	Pembrokeshire Marine/Sir SAC	26
5.3.15.	Pen Llyn a`r Sarnau/Lleyn Peninsula and the Sarnau SAC.....	26
5.3.16.	Rannoch Moor SAC	27
5.3.17.	River Avon SAC.....	27
5.3.18.	River Bladnoch SAC	28
5.3.19.	River Camel SAC	28
5.3.20.	River Clun SAC.....	29
5.3.21.	River Dee and Bala Lake SAC / Afon Dyfrdwy a Lyn Tegid SAC	29
5.3.22.	River Dee SAC	29
5.3.23.	River Derwent and Bassenthwaite Lake SAC	30
5.3.24.	River Eden SAC	30
5.3.25.	River Ehen SAC	31
5.3.26.	River Evelix SAC	31
5.3.27.	River Faughan and Tributaries SAC.....	32
5.3.28.	River Foyle and Tributaries SAC	32
5.3.29.	River Kent SAC.....	32
5.3.30.	River Oykel SAC.....	33
5.3.31.	River Roe and Tributaries SAC.....	33
5.3.32.	River South Esk SAC	34
5.3.33.	River Spey SAC.....	34
5.3.34.	River Tay SAC	34
5.3.35.	River Teith SAC	35
5.3.36.	River Tweed SAC.....	35
5.3.37.	River Usk SAC/Afon Wysg SAC.....	35
5.3.38.	River Wye/ Afon Gwy SAC	36
5.3.39.	Solway Firth SAC.....	36

5.3.40.	Southern North Sea SAC	37
5.3.41.	The Wash and North Norfolk Coast SAC	38
5.3.42.	Upper Ballinderry River SAC	39
5.3.43.	West Wales / Gorllewin Cymru Forol SAC	39
5.4.	Birds.....	40
5.4.3.	Ailsa Craig SPA.....	41
5.4.4.	Alde-Ore Estuary SPA.....	42
5.4.5.	Anglesey Terns/Morwenoliaid Ynys Môn SPA	42
5.4.6.	Bowland Fells SPA.....	43
5.4.7.	Coquet Island SPA.....	43
5.4.8.	Farne Islands SPA	44
5.4.9.	Flamborough & Filey Coast SPA.....	45
5.4.10.	Forth Islands SPA	49
5.4.11.	Greater Wash SPA.....	51
5.4.12.	Liverpool Bay SPA.....	51
5.4.13.	Lough Neagh & Lough Beg Ramsar	53
5.4.14.	Mersey Narrows and North Wirral Foreshore SPA.....	53
5.4.15.	Morecambe Bay Ramsar, Duddon Estuary Ramsar & Morecambe Bay and Duddon Estuary SPA 54	
5.4.16.	North Norfolk Coast Ramsar & SPA	55
5.4.17.	Northumberland Marine SPA.....	56
5.4.18.	Northumbria Coast Ramsar	57
5.4.19.	Outer Firth of Forth and St. Andrews Bay Complex SPA.....	57
5.4.20.	Rathlin Island SPA	58
5.4.21.	Ribble & Alt Estuaries Ramsar & SPA	59
5.4.22.	Skomer, Skokholm and the Seas off Pembrokeshire SPA.....	60
5.4.23.	St Abb's Head to Fast Castle SPA.....	60
5.4.24.	Strangford Lough Ramsar	61
5.4.25.	The Wash Ramsar.....	62
5.4.26.	Upper Solway Flats & Marshes Ramsar.....	62

5.4.27.	Ynys Seiriol/ Puffin Island SPA	63
6.	Mitigation Measures	64
6.2.	Plan level mitigation	64
6.3.	Project specific mitigation	67
7.	Conclusions	67
8.	Derogation Case	69
8.1.	Alternative Solutions	69
	Step 1: Define the objectives or purpose of the plan and the problem it is causing.....	69
	Step 2: Understand the need for the plan	70
	Steps 3 and 4: Are there financially, legally and technically feasible alternative solutions, and are there alternative solutions with a lesser effect on the integrity of the European Site?.....	71
	Conclusion on Alternatives	76
8.2.	Imperative Reasons of Overriding Public Interest (IROPI).....	76
8.3.	Compensatory Measures.....	80
	Dogger Bank SAC	81
	Review of potential compensation measures	81
	Summary	87
	Flamborough and Filey Coast SPA.....	91
	Review of potential compensation measures	91
	Summary	95
	Proposed approach to delivery of compensation.....	95
8.4.	Conclusion	97
9.	References.....	98

1. Summary of the Conclusions of the Assessment

- 1.1.1. The Offshore Wind Leasing Round 4 Plan ("the Round 4 Plan") has been considered by The Crown Estate Commissioners ("The Crown Estate") in light of the assessment requirements of Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended) and Regulation 28 of The Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended).
- 1.1.2. Having carried out a screening assessment of the Plan, The Crown Estate concluded that a likely significant effect ("LSE") could not be discounted for a number of European Sites and European Offshore Marine Sites (together referred to as "European Sites" within the context of the UK's National Site Network) and their qualifying features (NIRAS, 2021) [that is to say, adopting the approach set out in the 'Waddenzee' ruling of the European Court of Justice Case C – 127/02, it was not possible to exclude, on the basis of objective information, the likelihood of significant effects on those European Sites without reasonable scientific doubt]. Consequently, an Appropriate Assessment ("AA") was required of the implications of the plan for the qualifying features of those sites in view of their conservation objectives.
- 1.1.3. Following the production of a Report to Inform an Appropriate Assessment ("RIAA") and the completion of an AA in accordance with the Regulations, The Crown Estate has ascertained that an adverse effect on site integrity ("AEOSI") cannot be ruled out on two European Sites as a result of the plan.
- 1.1.4. Natural England, Natural Resources Wales, the Joint Nature Conservation Committee, Department of Agriculture, Environment and Rural Affairs ("DAERA"), and other selected organisations have been consulted throughout the HRA process, and their submissions taken into account by The Crown Estate.

2. Introduction

2.1. Background

- 2.1.1. This is a record of the Habitats Regulation Assessment ("HRA") that The Crown Estate has undertaken under the Conservation of Habitats and Species Regulations 2017 (SI No. 2017/1012) ("the Habitats Regulations"), and The Offshore Marine Habitats and Species Regulations 2017 (SI No. 2017/1013) ("the Offshore Habitats Regulations"), in respect of the plan for seabed leasing of the Offshore Wind Leasing Round 4 Plan, referred to as "the Round 4 Plan".
- 2.1.2. In spring 2020, The Crown Estate initiated a two-stage tender process for the possible award of a minimum of 7GW and maximum of 8.5GW for offshore wind development across four seabed areas within the seas around England and Wales. Six "Preferred Projects" were accepted by The Crown Estate subject to the outcome of the HRA; an Agreement for Lease would secure a location for offshore wind development and represent the adoption of the Round 4 plan and provide security with regards to a lease for the export cable asset subject to project development. Subsequent award of seabed rights would permit offshore wind development as applied for through the tender process, subject to all necessary statutory consents being obtained by the applicant.
- 2.1.3. This Record of AA contains The Crown Estate's analysis and assessment of the potential impacts of the Round 4 Plan upon European Sites screened into this assessment.

2.1.4. It should be noted that the outcome of this plan does not authorise development; development consent and other key project consents must be obtained for each project in the normal manner under the existing regulatory regime.

2.1.5. For reference, The Crown Estate has also undertaken a Marine Conservation Zone assessment considering the features of sites designated under Part 5 of The Marine and Coastal Access Act 2008 separate to this HRA.

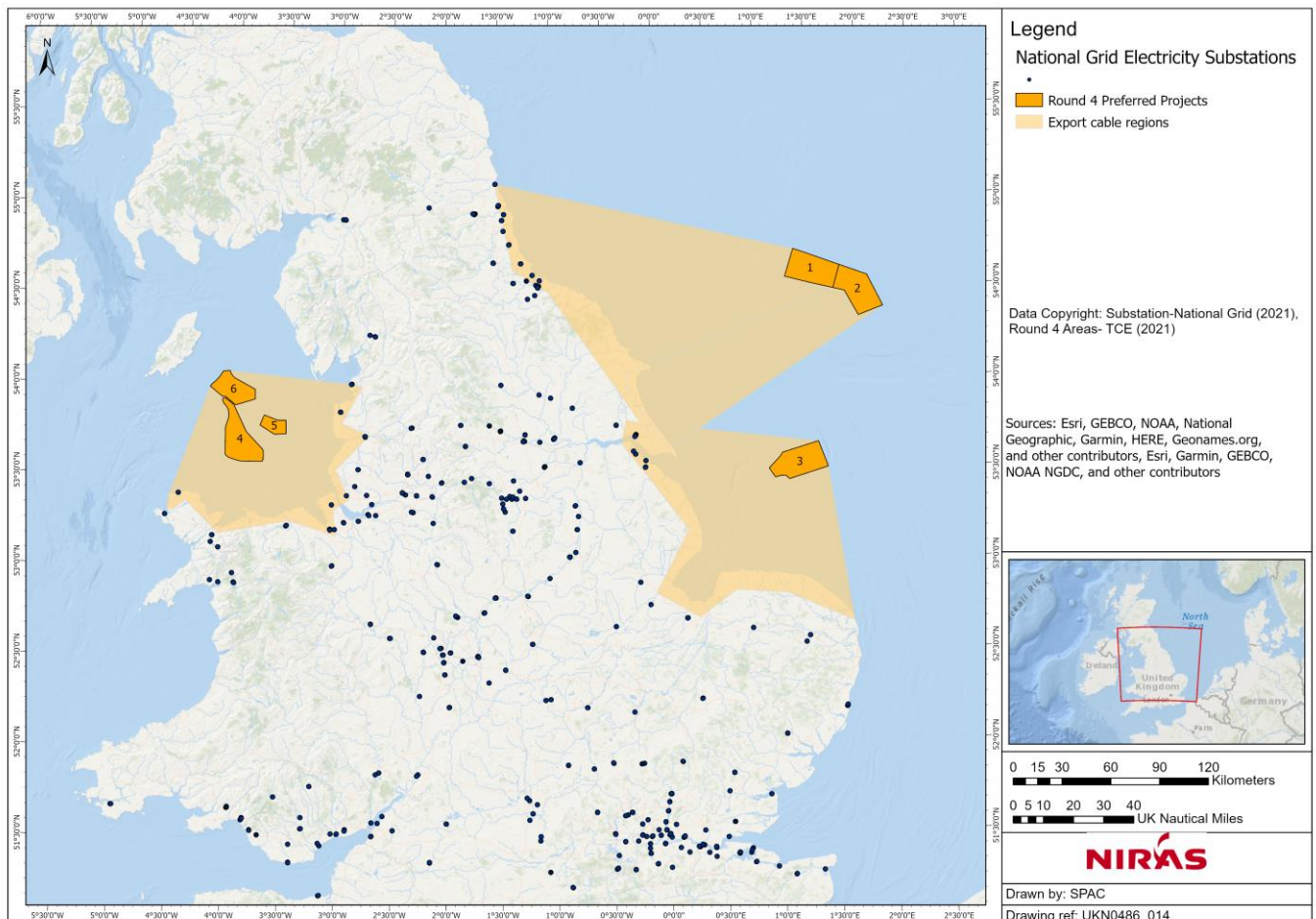


Figure 1 – Location of the Round 4 Plan Preferred Project Areas

2.2. Habitats Regulations Assessment (HRA)

2.2.1. Council Directive 92/43/EC on the conservation of natural habitats and of wild fauna and flora (“the Habitats Directive”) and Council Directive 2009/147/EC on the conservation of wild birds (“the Birds Directive”) aim to maintain or restore certain species and habitats to a favourable conservation status. Article 6(3) of the Habitats Directive makes specific provisions to protect sites from adverse effects associated with proposed plans and projects.

2.2.2. The Habitats Directive provides for the designation of sites for the protection of habitats and species of European importance, known as Special Areas of Conservation (“SACs”). The Birds Directive provides for the classification of sites for the protection of rare and vulnerable birds and for regularly occurring migratory species, known as Special Protection Areas (“SPAs”). SACs and SPAs, and as a matter of Government Policy

Ramsar Sites (wetlands of international importance designated under the Ramsar Convention 1971) are collectively termed European Sites and form part of a network of European Sites across Europe designated under the Bern Convention 1989 known as the Emerald Network. Prior to the UK's withdrawal from the European Union and subsequent transition period, these sites were part of the European Union's Natura 2000 network of European Sites. They now form part of a National Site Network.

2.2.3. In the UK, the Habitats Regulations transposed the Habitats and Birds Directives into national law as far as the 12nm limit of territorial waters. Beyond territorial waters, the Offshore Habitats Regulations serve the same function for the UK's offshore marine area. Following the UK's withdrawal from the European Union and subsequent transition period The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 ensure that the Habitats Regulations continue to operate effectively in the UK. The Round 4 Plan covers areas within and outside the 12nm limit so both sets of Regulations apply. They are collectively referred to as the Habitats Regulations for the purposes of this Record of AA.

2.2.4. Regulation 63 of the Habitats Regulations states that:

A competent authority....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, must make an Appropriate Assessment of the implications for that site in view of that site's conservation objectives.

2.2.5. Regulation 28 of the Offshore Habitats Regulations incorporates the equivalent provision.

2.2.6. The Round 4 Plan is not directly connected with, or necessary to, the management of European Sites. The Habitats Regulations require that, where it appears to The Crown Estate as a competent authority that the Round 4 Plan is likely to have a significant effect on any such European Site, either alone or in combination with other plans and projects, an AA is carried out in order to determine if it is possible to ascertain that it will not adversely affect the integrity of any European Site in view of that site's conservation objectives.

2.2.7. Through a competitive tendering process, The Crown Estate appointed NIRAS as HRA consultant. NIRAS are renowned experts, with a wealth of HRA and technical experience, particularly for the offshore wind sector. NIRAS have undertaken a shadow assessment and provided the information required to enable The Crown Estate to undertake an AA for the Round 4 Plan.

2.2.8. In outline, the approach to the HRA undertaken by The Crown Estate centres around three reports produced as part of the NIRAS shadow assessment:

- **Principles Document** – this sets out the criteria that were used in scoping European Sites into the assessment and the assessment methodology.
- **Screening Report** – this report assesses the potential impact of the plan and screens sites in or out of the AA based on the possibility that the plan will have a LSE on them.
- **Report to Inform Appropriate Assessment (RIAA)** – for those sites screened in, this report assesses the possibility of the plan having an AEOSI.

2.2.9. To inform the HRA, The Crown Estate has undertaken statutory consultation with the relevant UK statutory nature conservation bodies ("SNCBs") and with select government departments and non-departmental public bodies, as well as environmental non-governmental organisations ("NGOs"), which have relevant expertise in

relation to the Round 4 Plan (namely the Royal Society for Protection of Birds ("RSPB"), the Whale and Dolphin Conservation Society, and The Wildlife Trusts).

2.2.10. Natural England, Natural Resources Wales, the Joint Nature Conservation Committee, DAERA, and other selected organisations have therefore been consulted throughout the HRA process. The Crown Estate has given significant weight to the views of the SNCBs.

2.2.11. In accordance with the Habitat Regulations, European Sites comprise: designated Special Areas of Conservation ("SAC"), Sites of Community Importance ("SCI") included on the list of such sites compiled by the European Commission, candidate SAC ("cSAC") submitted to the European Commission for possible inclusion as an SCI, and classified Special Protection Areas ("SPA"). As a matter of Government policy, the following should be given the same protection as European Sites: potential SPA ("pSPA"); possible/proposed SAC ("pSAC"); and listed Ramsar sites. This protection is extended to proposed Ramsar sites in England and Wales (NPPF 2021; PPW, 2021). In England only, sites identified or required as compensatory habitat are also afforded the same protection in policy (NPPF 2021).

2.2.12. The RIAA drafted by NIRAS included non-UK European sites within the assessment, these are:

- Bray Head SPA
- Doggersbank Dutch SAC
- Duinen en Lage Land Texel SPA
- Duinen Vlieland SPA
- Howth Head Coast SPA
- Inishtrahull SPA
- Ireland's Eye SPA
- Klaverbank Dutch SAC
- Lambay Island SPA
- North Inishowen Coast SPA
- Rockabill SPA
- Saltee Islands SPA
- Waddenzee SPA
- Wicklow Head SPA

2.2.13. Of the above SACs, protected for marine mammals, NIRAS (2022) did not identify any significant effects from the Round 4 Plan given the distance from the European Sites and the nearest Preferred Project (over 26km); but on a precautionary basis assumed there was the potential for individual animals ranging from these European Sites to be present and subject to risk of injury or death. NIRAS noted that this risk can be reduced to negligible levels by implementation of standard best practice guidance (JNCC, 2010a&b). NIRAS concluded that there is negligible risk from disturbance and that any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact for Doggersbank Dutch SAC and Klaverbank Dutch SAC SACs.

2.2.14. The Crown Estate has considered the assessment of Doggersbank Dutch SAC and Klaverbank Dutch SAC carefully and agrees with the conclusions from NIRAS.

- 2.2.15. Of the above SPAs, NIRAS (2022) did not identify any significant effects from the Round 4 plan. Some features at the above SPAs (Bray Head: guillemot; Howth Head: guillemot; Inishtrahull: kittiwake; Ireland's Eye: guillemot and puffin; Lambay Island: lesser black-backed gull; Wicklow Head: guillemot) were identified as having a relatively high increase in mortality rate; however, the estimated number of mortalities from birds displaced/collisions was considered to be negligible and more likely indistinguishable from background mortality and it was considered that these effects would not undermine the site Conservation Objectives. NIRAS concluded that Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact for these SPAs.
- 2.2.16. The Crown Estate has considered the assessment of Bray Head SPA, Duinen en Lage Land Texel SPA, Duinen Vlieland SPA, Howth Head Coast SPA, Inishtrahull SPA, Ireland's Eye SPA, Lambay Island SPA, North Inishowen Coast SPA, Rockabill SPA, Saltee Islands SPA, Waddenzee SPA and Wicklow Head SPA carefully and agrees with the conclusions from NIRAS.
- 2.2.17. The Crown Estate has considered the assessment of transboundary impacts carefully and agrees with the conclusions from NIRAS. To inform The Crown Estate's assessment of these sites the Department of Housing, Local Government and Heritage in Ireland and the Ministry of Infrastructure and the Environment in the Netherlands were contacted. The departments of Ireland and the Netherlands did not raise any concerns in relation to transboundary effects from the Round 4 Plan and implications for the European Sites highlighted above (2.2.12 to 2.2.16). As a result, this AA does not consider these sites further.
- 2.2.18. In undertaking HRA it is open to a competent authority to consider implementing mitigation measures or amending its plan to avoid or reduce potentially damaging effects on European Sites. As part of the HRA process, the plan-making authority may agree to a plan only if the authority has ascertained that it will not adversely affect the integrity of a European Site. The only exception to this is where there are no alternative solutions and the plan must be carried out for imperative reasons of overriding public interest, in which case the authority must take all necessary compensatory measures.
- 2.2.19. This Record of AA should be read in conjunction with the following documents:
- NIRAS. 2020. Principles: Offshore Wind Leasing Round 4. Plan Level HRA. 38255_REP_100. Report prepared for The Crown Estate. 28 August 2020.
 - NIRAS. 2021. Offshore Wind Leasing Round 4 Plan Level HRA. Screening Report. July 2021.
 - NIRAS. 2022. Offshore Wind Leasing Round 4 Plan Level HRA. Report to Inform Appropriate Assessment. March 2022
- 2.2.20. The key information from these documents and the representations of the SNCBs is summarised and referenced in the subsequent sections of this document.

3. Screening

3.1. The Likely Significant Effects Test

- 3.1.1. Under Regulation 63 of the Habitats Regulations and Regulation 28 of the Offshore Habitats Regulations, a competent authority must consider whether a plan or project may result in a LSE on a European Site, either alone or in combination with other plans or projects. A LSE is, in this context, any effect that may be reasonably predicted as a consequence of a plan that may undermine the conservation objectives of the features for which the site was designated, but excluding trivial or inconsequential effects. An AA is required if a plan is likely to have a significant effect on a European site, either alone or in combination with other plans or projects.
- 3.1.2. The purpose of this test is to identify LSEs on any European Sites that may result from the implementation of the Round 4 Plan, and to record The Crown Estate's conclusions on the need for an AA. For those features where a LSE cannot be ruled out, these must be subject to an AA. This review of potential implications can be described as a 'two-tier process' with the LSE test as the first tier and the AA of effects on integrity as the second tier.
- 3.1.3. This section addresses this first step of the HRA process, for which The Crown Estate has considered the potential impacts of the Round 4 Plan either alone or in combination with other plans and projects on European Sites to determine whether there is a risk of LSEs.

3.2. Screening – Identification of Likely Significant Effects

- 3.2.1. A screening exercise was undertaken to identify European Sites where there may be a LSE arising from the Round 4 Plan, based on impact pathways and criteria as set out in the Principles Report (NIRAS, 2020). For the purposes of undertaking the screening, a worst-case scenario has been adopted based on the project envelope provided by preferred bidders in their response to the first Invitation to Tender (ITT1) in June 2020.
- 3.2.2. For the screening exercise both the Preferred Project areas and cable regions identified were utilised to ensure any uncertainty around project design did not impact upon the assessment of potential risk of LSE. All European Sites (including pSPAs, pSACs and Ramsar sites) were included in the HRA screening exercise (excluding European Sites supporting terrestrial and freshwater habitats and species, and migratory birds where there is no pathway of connectivity with the plan).
- 3.2.3. The criteria outlined in the Principles Document were applied to the qualifying features of European Sites, based on the impact pathways (as defined in the Principles Document) within the Preferred Project areas and the cable route regions. For the purposes of this plan-level HRA, a LSE was assumed to arise where there is the potential presence of an impact pathway resulting from all phases of development that may comprise part of the Round 4 Plan, including pre-construction, construction, operation, maintenance and decommissioning. Each pathway identified can potentially lead to a variety of impacts, which can affect receptors in different ways. Further analysis was undertaken to identify the 'pressures' that could arise through these pathways. The use of pressures in this way matches the approach adopted for the 2017 Project Extensions HRA (NIRAS, 2019).
- 3.2.4. To ensure compliance with recent case law, no mitigation measures to avoid or reduce any potential harmful effects of the plan were assumed or applied at the screening stage (see judgment of 12 April 2018, *People Over Wind and Others*, Case C-323/17, EU:C:2018:244, paragraph 40).

- 3.2.5. The Screening Report has identified the qualifying sites and features under the Habitat Regulations and the Ramsar Convention that ought to be included for assessment. The qualifying sites and features for which the possibility of LSE (as a result of the plan) could not be excluded are listed in section 3 of the Screening Report. A full list of the sites and qualifying features screened into the assessment is detailed in Appendix C of the Screening Report.
- 3.2.6. Natural England, Natural Resources Wales, JNCC, DAERA and other selected organisations were consulted on the Principles Document, the Screening Report, and their views taken into account.
- 3.2.7. The Crown Estate has reviewed the Screening Report, and the feedback provided by the SNCBs and is satisfied that the screening exercise has been conducted in an appropriate manner. The Crown Estate are further satisfied that an appropriate list of European Sites and their qualifying features (as detailed in Appendix C of the Screening Report (based on the potential for LSE)) has been taken forward for assessment.
- 3.2.8. Given the findings of the screening assessment, and the fact that the Round 4 Plan is not directly connected with or necessary to the management of a European Site, The Crown Estate has made an AA of the implications of the Round 4 Plan for these sites in view of the sites' conservation objectives. The AA has been informed by the detail of the Screening Report (NIRAS, 2021) and the RIAA produced by NIRAS, (2022).

4. Appropriate Assessment

4.1. Test for Adverse Effect on Site Integrity

- 4.1.1. The requirement to undertake an AA is triggered when a competent authority, in this case The Crown Estate Commissioners, determines that a plan or project may have a likely significant effect on a European Site either alone or in combination with other plans or projects. Guidance issued by the European Commission states that the purpose of an AA is to enable a competent authority to ascertain that the plan or project will not adversely affect the integrity of any European Site, either alone or in combination with other plans and projects, and in view of the site's conservation objectives (European Commission, 2018).
- 4.1.2. If the competent authority cannot ascertain the absence of an AEOSI beyond reasonable scientific doubt, then under the Habitats Regulations it may not agree to the plan or project unless it can pass further legal tests and be granted a 'derogation.' Such a derogation allows a plan or project to proceed notwithstanding the risk of an AEOSI but only if there is no alternative solution, the plan or project must be carried out for imperative reasons of overriding public interest ("IROPI") and compensatory measures necessary to ensure the overall coherence of the National Site Network are secured.
- 4.1.3. Guidance from the European Commission confirms that disturbance to a species or deterioration of habitats, for which a European Site has been designated, must be considered in relation to the integrity of that site and its conservation objectives (European Commission, 2018 para 4.6.3):

"The appropriate assessment focuses on assessing the implications for the site of the plan or project, individually or in combination with other plans or projects, in view of the site's conservation objectives. Article 6(3) must therefore be read in close conjunction with Article 6(1) and 6(2) since the conservation objectives to be used in the appropriate assessment are linked also to these two earlier paragraphs."

Section 4.6.4 of the guidance defines site integrity as:

“...the coherent sum of the site’s ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is or will be classified.”

4.1.4. Conservation objectives outline the desired state for a European Site, in terms of the interest features for which it has been designated.

4.1.5. There are no set thresholds at which impacts on site integrity are considered to be adverse. This is a matter for interpretation on a site-by-site basis, depending on the designated feature and nature, scale and significance of the impact.

4.1.6. Conservation objectives have been used by The Crown Estate to consider whether the Round 4 Plan has the potential to result in an AEOSI, either alone or in combination.

4.2. RIAA Methodology

4.2.1. The assessment undertaken by NIRAS sought to determine whether the potential for LSEs identified during the Stage 1 Screening exercise could result (either alone or in-combination with other plans or projects) in an adverse effect on European Site integrity. For all European Sites/features that were screened in, an assessment was made of whether it could be ascertained that the Round 4 Plan would not lead to an adverse effect on the integrity of a European Site.

4.2.2. The RIAA was undertaken in three assessment stages to account for the different pressures associated with the Export Cable Regions and the Preferred Project arrays. However, the final conclusions on the risk of the Preferred Projects having an AEOSI of any European Sites were reached based on a comprehensive view of all three assessment stages.

4.2.3. The methodology of all three assessment stages follows the key assessment principles as described previously in the Round 4 Plan Level HRA Principles Report (NIRAS, 2020). A fundamental principle of the RIAA is the commitment to undertake a reasonable and meaningful assessment where possible. This allows The Crown Estate to determine which of the assessments can be concluded at the plan level, and which can only be meaningfully assessed at the project level HRA stage.

4.2.4. Stage one of the assessment assesses the risk of the Export Cable Regions (the Export Cable Region Assessment (“ECRA”)) having an AEOSI of the European Sites and associated features screened in for pressures associated with cable infrastructure.

4.2.5. Stages two and three of the assessment together make up the Array Assessment, which assess the risk of the Preferred Project arrays having an AEOSI on the European Sites and associated features that were screened in for pressures associated with the array areas, including inter array cabling.

- Stage two assesses if the risk of an AEOSI can be excluded at a number of SPAs in view of the characteristics associated with three categories of seabird features (foraging range over land, SPAs designated as foraging areas and species with large foraging ranges). These characteristics were previously considered within the Screening Report, but the associated level of impact is assessed.
- Stage three provides additional quantitative and qualitative analysis to assess the risk of an AEOSI for all other European Sites and associated features screened in for pressures associated with the array.

4.2.6. The Crown Estate is satisfied that this is an appropriate approach to undertaking the assessment.

4.3. In Combination Assessment

4.3.1. The approach to the in-combination assessment undertaken by NIRAS builds upon the assessments undertaken for each European Site with respect to Round 4 Plan-related effects acting alone. An initial search was undertaken to capture broad plan or project categories with the following criteria:

- applications for a new permission;
- applications to change an existing permission;
- granted permissions that have not begun or been completed;
- granted permissions that need renewing; and
- plans that have been drafted but not yet adopted.

4.3.2. Specific plans and projects were then identified for inclusion in the in-combination assessment (RIAA Appendix B), by means of a quantitative exercise involving interrogation of a number of data sources in addition to a manual search.

4.3.3. The project data sources were interrogated using spatial criteria against the European Sites which were identified in the Screening Report. For most receptors the criteria chosen are specific to the type of activity and reflects the furthest distance within which the pressures associated with that activity can cause an effect. In addition to the use of spatial criteria, a final search was carried out to identify any plans and projects not captured in the data sources. This involved a search of the websites of the key UK and devolved Governments (and their agencies) with statutory responsibilities for projects in UK territorial waters and the Exclusive Economic Zone.

4.3.4. Following the identification of specific plans and projects, the SNCB tiering system for offshore windfarms was applied (RIAA Appendix A, Table 2.2). The plans and projects included in the tiers were then further categorised to determine how they would be treated in the in-combination assessment. There are three categories taken into account in the SNCB tiering system, and that logic has been applied to other types of development and activity as part of the in-combination assessment. See RIAA Appendix A for further detail.

4.3.5. Following the completion of the RIAA, East Anglia One North Offshore Wind Farm and East Anglia Two Offshore Wind Farm were both granted development consent under the Planning Act 2008 on 31 March 2022. The Crown Estate has undertaken a review of the RIAA in light of these decision and considers that these projects should be moved from Tier 4 (projects that have an application submitted to the appropriate regulatory body that have not yet been determined) to Tier 3 (projects that have been consented (but construction has not yet commenced). However, this change in status does not materially alter the in combination assessment as the treatment of Tier 3 and Tier 4 projects is the same.

4.3.6. The Crown Estate is satisfied that a suitable approach has been taken to consideration and assessment of in-combination effects.

4.4. Uncertainties

4.4.1. A precautionary approach has been taken to assumptions about Round 4 Plan activities based on information supplied by the Preferred Projects, with a 'worst-case' for various Round 4 Plan activities and potential impact pathways used for the assessment. The RIAA utilised the best available information at the time of

assessment, to make a determination of whether it can be concluded that the plan will not have an AEOSI. In cases where uncertainties about the magnitude of likely effects arose (e.g. based on uncertainty about the scale, design, configuration or precise location of the Preferred Projects, or limitations in the available data), it was not always possible to undertake a meaningful, quantitative assessment of the effects that are likely to arise.

4.4.2. Because the integrity test incorporates the application of the precautionary principle as a matter of law, and because plan assessments are, by their nature, less precise than project assessments, it is important for the assessment process to eliminate the prospect of adverse effects on site integrity in so far as that is possible at the level of specificity inherent in the nature and purpose of the particular plan. This can be achieved through the incorporation of plan specific mitigation or incorporation of specific restriction with regard to plan delivery, or the addition of further mitigation measures in lower plans or projects.

4.4.3. The Crown Estate is satisfied that the approach to uncertainties adopted by the RIAA is appropriate, namely that where meaningful assessment cannot be undertaken at plan level (owing to this absence of key information), reliance can be placed on the project-level assessment (specifically at the lower the project-level HRA). This is on the basis that project-level HRA:

- Will be required as a matter of law at that stage;
- Will need to identify and assess the magnitude of all LSEs including those effects identified at plan level which are affected by uncertainty;
- Will be able to determine and secure, where necessary, appropriate and feasible mitigation measures;
- Will be able to more precisely identify the nature timing, duration, scale or location of development, based on further detailed information and data, and therefore will be able to ascertain with more certainty the magnitude of the effects of each project to enable an AEOSI to be avoided.

4.4.4. The Crown Estate also agrees that there will be sufficient flexibility and scope for avoidance and appropriate mitigation to be implemented at project level to avoid AEOSI in respect of European Sites in relation to certain elements of the Round 4 Plan. The Crown Estate notes to the Advocate General's opinion in the European Court of Justice case C-6/04 European Commission v United Kingdom confirming that the progression of assessment that must take place as a plan become more specific whereby 'adverse effects on areas of conservation must be assessed at every relevant stage of the procedure to the extent possible on the basis of the precision of the plan. This assessment is to be updated with increasing specificity in subsequent stages of the procedure.'

4.4.5. The ECRA was undertaken for European Sites and features for which the Screening Report identified a risk of LSE from an Export Cable Region. The export cable routes for Preferred Projects have not yet been defined, and consequently there is considerable uncertainty associated with the spatial parameters required for detailed assessment. The ECRA was used to evaluate the overall risk of an AEOSI from each Export Cable Region (and the Export Cable Regions collectively), alone and in-combination with other plans and projects.

4.4.6. The Crown Estate has reviewed the consultation responses submitted by members of the HRA Expert Working Group ("EWG"), which was established enable effective technical engagement and includes the statutory nature conservation bodies (SNCBs as well as NGOs that have relevant expertise in relation to the Round 4 Plan), and is satisfied that the assessment has been conducted in an appropriate manner.

5. Assessment Findings

5.1.1. The following sections provide a summary of the key findings of the assessment in relation to the European Sites and features screened into the assessment, and a summary of any relevant feedback provided by the SNCBs and other consultees.

5.1.2. As highlighted previously the RIAA included non-UK European Sites within the assessment. Having reviewed the assessment on those non-UK sites (see 2.2.12 - 2.2.15), The Crown Estate agrees with the conclusions from NIRAS on these sites and this AA does not consider these sites further.

5.2. Annex I Habitats

5.2.1. Dogger Bank SAC

5.2.1.1. The Dogger Bank SAC is designated for the conservation of the protection of sandbanks which are slightly covered by sea water all the time. The feature is currently in unfavourable condition with a restore conservation objective.

5.2.1.2. Section 4.10.2 to 4.10.8 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying feature of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical damage, indirect physical damage, toxic contaminants, temperature, suspended sediments and invasive species both alone, and in combination with other reasonably foreseeable plans and projects.

5.2.1.3. NIRAS (2022) concluded that an AEOSI due to habitat loss/gain and direct physical damage cannot be excluded beyond reasonable scientific doubt as it is not possible to state with certainty that the impacts would not lead to a significant change in the extent and distribution, ecological function and/or the supporting processes of the sandbanks feature.

5.2.1.4. The Primary Assessment (RIAA Appendix J) found that, with the exception of habitat loss and direct damage, all screened in pressures would lead to a negligible impact on this feature at any scale. The Secondary Assessment (RIAA Appendix J) took account of feature sensitivity, the scale of the impact (to the attribute, extent and distribution of the feature) and ecological function and supporting processes.

5.2.1.5. The Secondary Assessment calculated for habitat loss the impact from the Round 4 Plan alone is 2.035km², which equates to 0.016% of this features distribution within this European Site. Impacts would delay restoration, which is contrary to the conservation objectives of this SAC. Options to mitigate such impacts at the plan-level are limited, but consideration has been given to reduction of infrastructure within the SAC.

5.2.1.6. The Secondary Assessment calculated for habitat damage (P2 –direct physical damage) that the impact from the Round 4 Plan alone is 32.209km², which equates to 0.261% of the feature's distribution within this European Site. Such impacts would delay restoration, which is contrary to the conservation objectives of this SAC. Options to mitigate such an impact are limited to the removal of Preferred Projects 1 and 2 from the Round 4 Plan. However, this is not an acceptable mitigation measure as it would not meet the renewable energy generation targets of the Round 4 Plan. Further consideration of mitigation for Dogger Bank SAC is within the Mitigation Measures Section.

- 5.2.1.7. The unfavourable condition of the site is believed to relate (at least in part) to the current impacts on the site from the presence of large-scale and widespread infrastructure associated with offshore oil and gas and cabling activities (JNCC, 2018). As such, there is also the potential for existing plans and projects to act in combination with the proposed Round 4 Plan, and specifically Preferred Projects 1 and 2 to prevent or impede the achievement of the conservation objectives to restore the extent and distribution and the structure and function of the qualifying sandbank habitat and return the site to a favourable condition.
- 5.2.1.8. The Crown Estate has reviewed the detail of the RIAA with respect to the Dogger Bank SAC. It has been possible to undertake a meaningful assessment of the potential impacts arising from the Dogger Bank SAC site owing to the ability to make an estimation of potential habitat loss and direct physical damage based on worst-case project parameters and the direct spatial overlap with the Dogger Bank SAC. The Crown Estate has also reviewed submissions made by Preferred Projects 1 and 2 in relation to 'as-built' headroom considerations resulting from the difference between what was consented for the four Round 3 projects (8.2km², 0.05% of SAC area) and what will be built out. The build scenarios for the four consented wind farms (Dogger Bank A, Dogger Bank B, Dogger Bank C and Sofia) results in an at least threefold reduction in their seabed footprint such that at least 3.95km² (0.032% of SAC area) within the Dogger Bank SAC will not be impacted.
- 5.2.1.9. Natural England, JNCC and The Wildlife Trusts agreed with the findings of the RIAA in relation to AEOSI on Dogger Bank SAC. The Crown Estate agrees with the conclusions of the RIAA relating to the likely magnitude of potential impact on the sandbank feature of the Dogger Bank SAC.
- 5.2.1.10. The Crown Estate has considered the ability to mitigate the impact on the Dogger Bank SAC and has concluded that, based on the evidence currently available, it is possible to mitigate impacts but not to an acceptable level (see Mitigation Measures Section). The Crown Estate has therefore decided that it is unable to conclude that the Plan will not adversely affect the integrity of the Dogger Bank SAC and that the further tests set out in the Habitats Regulations must be applied. These include an assessment of alternatives, IROPI and compensatory measures.
- 5.2.2. North Norfolk Sandbanks and Saturn Reef SAC**
- 5.2.2.1. The North Norfolk Sandbanks and Saturn Reef SAC is a SAC designated for the conservation of reef and sandbanks which are slightly covered by sea water all the time. The features are currently in unfavourable condition with restore conservation objectives.
- 5.2.2.2. Section 4.17.2 to 4.17.12 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to indirect physical damage, toxic contaminants, suspended sediments and invasive species both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.2.2.3. NIRAS (2022) concluded that there will be no adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.2.2.4. The Primary Assessment (RIAA Appendix J) found that, with the exception of indirect damage, all screened in pressures would lead to a negligible impact on this feature at any scale. The Secondary

Assessment (RIAA Appendix J) took account of feature sensitivity, the scale of the impact and ecological function and supporting processes. The Secondary Assessment has found that due to the distance between the Round 4 Plan and this European Site (more than 5km for reef and sandbanks which are slightly covered by sea water all the time), it would be unrealistic to expect any detectable impact from indirect damage. Other plans or projects have the potential to exert the same pressures described above. However, in view of the above assessment, any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact. The assessment does not replace the information requirements of project level HRA and does not attempt to pre-empt their conclusions.

5.2.2.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to North Norfolk Sandbanks and Saturn Reef SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the North Norfolk Sandbanks and Saturn Reef SAC, alone or in-combination with other plans and projects.

5.2.3. Shell Flat and Lune Deep SAC

5.2.3.1. The Shell Flat and Lune Deep SAC is a SAC designated for the conservation of reef and sandbanks which are slightly covered by sea water all the time. The condition of features of the site are currently unavailable but the site has maintain or restore conservation objectives.

5.2.3.2. Section 4.44.2 to 4.44.12 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to indirect physical damage, toxic contaminants, suspended sediments and invasive species both alone, and in combination with other reasonably foreseeable plans and projects.

5.2.3.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.2.3.4. The Primary Assessment (RIAA Appendix J) found that, with the exception of indirect damage, all screened in pressures would lead to a negligible impact on this feature at any scale. The Secondary Assessment (RIAA Appendix J) took account of feature sensitivity, the scale of the impact and ecological function and supporting processes. The Secondary Assessment has found that due to the distance between the Round 4 Plan and this European Site (more than 20km – reefs and 5km sandbanks slightly covered by seawater all the time), it would be unrealistic to expect any detectable impact from indirect damage. Other plans or projects have the potential to exert the same pressures described above. However, in view of the above assessment, any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact. The assessment does not replace the information requirements of project level HRAs and does not attempt to pre-empt their conclusions.

5.2.3.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Shell Flat and Lune Deep SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the Shell Flat and Lune Deep SAC, alone or in-combination with other plans and projects.

5.3. Annex II Species

5.3.1. Afon Eden – Cors Goch Trawsfynydd SAC

- 5.3.1.1. The Afon Eden - Cors Goch Trawsfynydd SAC is a SAC designated for the conservation of Atlantic salmon and freshwater pearl mussel. The features are currently in unfavourable condition with restore conservation objectives.
- 5.3.1.2. Section 4.2.2 to 4.2.7 of the RIAA provides detailed assessment of the potential risk of AEOSI of the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.1.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.1.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Afon Eden - Cors Goch Trawsfynydd SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the Afon Eden - Cors Goch Trawsfynydd SAC, alone or in-combination with other plans and projects.
- 5.3.2. Afon Gwyfai a Llyn Cwellyn SAC**
- 5.3.2.1. The Afon Gwyfai a Llyn Cwellyn SAC is a SAC designated for the conservation of Atlantic salmon. The feature is currently in unfavourable (unclassified) condition with a maintain or restore conservation objective.
- 5.3.2.2. Section 4.3.2 to 4.3.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.2.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.2.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Afon Gwyfai a Llyn Cwellyn SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the Afon Gwyfai a Llyn Cwellyn SAC, alone or in-combination with other plans and projects.
- 5.3.3. Afon Teifi/River Teifi SAC**
- 5.3.3.1. The Afon Teifi/River Teifi SAC is a SAC designated for the conservation of Atlantic salmon. The feature is currently in unfavourable (unclassified) condition with a maintain or restore conservation objective.
- 5.3.3.2. Section 4.4.2 to 4.4.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified

relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.3.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.3.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Afon Teifi/River Teifi SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the Afon Teifi/River Teifi SAC, alone or in-combination with other plans and projects.

5.3.4. Berriedale and Langwell Waters SAC

5.3.4.1. The Berriedale and Langwell Waters SAC is a SAC designated for the conservation of Atlantic salmon. The feature is currently in favourable (maintained) condition with a maintain conservation objective.

5.3.4.2. Section 4.5.2 to 4.5.6 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.4.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.4.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Berriedale and Langwell Waters SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the Berriedale and Langwell Waters SAC, alone or in-combination with other plans and projects.

5.3.5. Bristol Channel Approaches SAC

5.3.5.1. The Bristol Channel Approaches SAC is a SAC designated for the conservation of harbour porpoise. The feature is currently in favourable condition with a maintain conservation objective.

5.3.5.2. Section 4.6.2 to 4.6.10 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.5.3. The Primary Assessment (RIAA Appendix I) found that, with the exception of underwater noise, all screened in pressures would lead to a negligible impact on this species at any population scale. The Secondary Assessment (RIAA Appendix I) included an estimate of the number of individuals likely to be present within a 500m injury radius of any location within each of the Preferred Projects. This did not exceed 1 animal at any of the Preferred Projects. The Secondary Assessment also found that the impact

associated with disturbance would be negligible for harbour porpoise because the European Site lies more than 26km from the closest Preferred Project.

- 5.3.5.4. No in-combination impact is expected in relation to injury or disturbance due to the location of this European Site (more than 26km from any of the Preferred Project) and use of standard best practice guidance (JNCC, 2010a&b).
- 5.3.5.5. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.5.6. Natural England advised the Bristol Channel Approaches SAC should have a European Site in-combination score of 'medium' rather than 'low'. Following a review of the assessment, NIRAS updated this European Site in-combination score to 'medium' however this does not affect the conclusions in respect of this European Site and its features. The Crown Estate considers that the in-combination assessment has been undertaken appropriately within the RIAA.
- 5.3.5.7. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Bristol Channel Approaches SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the Bristol Channel Approaches SAC, alone or in-combination with other plans and projects.
- 5.3.6. Cardigan Bay/Bae SAC**
- 5.3.6.1. The Cardigan Bay/Bae SAC is a SAC designated for the conservation of grey seal and bottlenose dolphin, as well as other Annex II species (Screening Report, Appendix C) not considered within this AA. The features are currently in favourable condition with maintain conservation objectives.
- 5.3.6.2. Section 4.7.2 to 4.7.17 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, above water noise, toxic contaminants, electromagnetic fields, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.6.3. The Primary Assessment (RIAA Appendix I) found that, with the exception of underwater noise, all screened in pressures would lead to a negligible impact on these species at any population scale. The Secondary Assessment (RIAA Appendix I) included an estimate of the number of individuals likely to be present within a 500m injury radius of any location within each of the Preferred Projects. This did not exceed 1 animal at any of the Preferred Projects. The Secondary Assessment also found that the impact associated with disturbance would be negligible for both features because the European Site lies more than 26km from the closest Preferred Project.
- 5.3.6.4. No in-combination impact is expected in relation to injury or disturbance due to the location of this European Site (more than 26km from any of the Preferred Project) and use of standard best practice guidance (JNCC, 2010a&b).

5.3.6.5. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.6.6. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Cardigan Bay/Bae SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the Cardigan Bay/Bae SAC, alone or in-combination with other plans and projects.

5.3.7. Cladagh (Swanlinbar) River SAC

5.3.7.1. The Cladagh (Swanlinbar) River SAC is a SAC designated for the conservation of freshwater pearl mussel. The condition of the feature is not currently available but has a maintain or restore conservation objective.

5.3.7.2. Section 4.8.2 to 4.8.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying feature of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.7.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.7.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Cladagh (Swanlinbar) River SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Cladagh (Swanlinbar) River SAC, alone or in-combination with other plans and projects.

5.3.8. Dee Estuary/Aber Dyfrdwy SAC

5.3.8.1. The Dee Estuary/Aber Dyfrdwy SAC is a SAC designated for the conservation of river lamprey and sea lamprey. The features are currently in unfavourable condition with maintain or restore conservation objectives.

5.3.8.2. Section 4.9.2 to 4.9.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.8.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.8.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Dee Estuary/Aber Dyfrdwy SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the Dee Estuary/Aber Dyfrdwy SAC, alone or in-combination with other plans and projects.

5.3.9. Humber Estuary SAC

- 5.3.9.1. The Humber Estuary SAC is a SAC designated for the conservation of the Annex II species river lamprey and sea lamprey as well as grey seal. The condition of the fish features is currently unavailable but they have a maintain or restore conservation objective, whilst grey seal is in favourable condition with a maintain conservation objective.
- 5.3.9.2. Section 4.12.2 to 4.12.14 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical damage, indirect physical damage, collision, physical presence, underwater noise, above water noise, toxic contaminants, electromagnetic fields, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.9.3. For grey seal the Primary Assessment (RIAA Appendix I) found that, with the exception of underwater noise, all screened in pressures would lead to a negligible impact on these species at any population scale. The Secondary Assessment (RIAA Appendix I) included an estimate of the number of individuals likely to be present within a 500m injury radius of any location within each of the Preferred Projects. This did not exceed 1 animal at any of the Preferred Projects. The Secondary Assessment also found that the impact associated with disturbance would be negligible for both features because the European Site lies more than 26km from the closest Preferred Project.
- 5.3.9.4. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.9.5. The Wildlife Trusts raised concerns regarding foraging behaviour of grey seal within the Humber Estuary and the requirement for the RIAA to consider the impacts of Preferred Projects 1-3 on foraging range. Subsequently NIRAS has provided additional information within paragraphs 5.1.9 of the RIAA Appendix I to confirm that functionally linked habitat has been considered, consequently this does not affect the conclusions in respect of this European Site and its features. The Crown Estate considers that the assessment has been undertaken appropriately.
- 5.3.9.6. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Humber Estuary SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the Humber Estuary SAC, alone or in-combination with other plans and projects.
- 5.3.10. Lough Melvin SAC**
- 5.3.10.1. The Lough Melvin SAC is a SAC designated for the conservation of Atlantic salmon. The condition of the feature is currently unavailable but it has a maintain conservation objective.
- 5.3.10.2. Section 4.14.2 to 4.14.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

- 5.3.10.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.10.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Lough Melvin SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Lough Melvin SAC, alone or in-combination with other plans and projects.
- 5.3.11. North Anglesey Marine/Gogledd Môn Forol SAC**
- 5.3.11.1. The North Anglesey Marine/Gogledd Môn Forol SAC is a SAC designated for the conservation of harbour porpoise. The feature has a maintain conservation objective and is currently in favourable condition.
- 5.3.11.2. Section 4.16.2 to 4.16.10 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.11.3. The Primary Assessment (RIAA Appendix I) found that, with the exception of underwater noise, all screened in pressures would lead to a negligible impact on this species at any population scale. The Secondary Assessment (RIAA Appendix I) included an estimate of the number of individuals likely to be present within a 500m injury radius of any location within each of the Preferred Projects. This did not exceed 1 animal at any of the Preferred Projects. The Secondary Assessment also found that a small proportion of Preferred Project 4 overlaps with a 26 km radius (2.05%), but that the majority of potential piling or UXO locations within Preferred Project 4 lie beyond 26km.
- 5.3.11.4. No in-combination impact is expected in relation to injury due to the use of standard best practice guidance (JNCC, 2010a&b). For disturbance the Round 4 Plan will not make an appreciable difference to any in-combination impact.
- 5.3.11.5. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the European Site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.11.6. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to North Anglesey Marine/Gogledd Môn Forol SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of North Anglesey Marine/Gogledd Môn Forol SAC, alone or in-combination with other plans and projects.
- 5.3.12. North Channel SAC**
- 5.3.12.1. The North Channel SAC is a SAC designated for the conservation of harbour porpoise. The feature has a maintain conservation objective and is currently in favourable condition.
- 5.3.12.2. Section 4.15.2 to 4.15.10 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan.

This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

- 5.3.12.3. The Primary Assessment (RIAA Appendix I) found that, with the exception of underwater noise, all screened in pressures would lead to a negligible impact on this species at any population scale. The Secondary Assessment (RIAA Appendix I) included an estimate of the number of individuals likely to be present within a 500m injury radius of any location within each of the Preferred Projects. This did not exceed 1 animal at any of the Preferred Projects. The Secondary Assessment also found that the impact associated with disturbance would be negligible for harbour porpoise because the European Site lies more than 26km from the closest Preferred Project.
- 5.3.12.4. No in-combination impact is expected in relation to injury or disturbance due to the location of this European Site (more than 26km from any of the Preferred Project) and use of standard best practice guidance (JNCC, 2010a&b).
- 5.3.12.5. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.12.6. The Wildlife Trusts disagreed with the in-combination assessment conclusions due to the uncertainty of in-combination impacts. No concerns were raised by the SNCBs for this feature at this European Site. The Crown Estate considers the best available evidence has been used by NIRAS and that the in-combination assessment has been undertaken appropriately.
- 5.3.12.7. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to North Channel SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of North Channel SAC, alone or in-combination with other plans and projects.
- 5.3.13. Owenkillev River SAC**
- 5.3.13.1. The Owenkillev River SAC is a SAC designated for the conservation of Atlantic salmon and freshwater pearl mussel. The condition of the features is currently unavailable but their conservation objectives are to maintain (salmon) and maintain or restore (freshwater pearl mussel).
- 5.3.13.2. Section 4.18.2 to 4.18.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.13.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.13.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Owenkillev River SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not

adversely affect the integrity of to Owenkillev River SAC, alone or in-combination with other plans and projects.

5.3.14. Pembrokeshire Marine/Sir SAC

5.3.14.1. The Pembrokeshire Marine/Sir SAC is a SAC designated for the conservation of grey seal. The feature has a maintain or restore conservation objective and is currently in favourable condition.

5.3.14.2. Section 4.19.2 to 4.19.10 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.14.3. The Primary Assessment (RIAA Appendix I) found that, with the exception of underwater noise, all screened in pressures would lead to a negligible impact on this species at any population scale. The Secondary Assessment (RIAA Appendix I) included an estimate of the number of individuals likely to be present within a 500m injury radius of any location within each of the Preferred Projects. This did not exceed 1 animal at any of the Preferred Projects. The Secondary Assessment also found that the impact associated with disturbance would be negligible for grey seal because the European Site lies more than 26km from the closest Preferred Project.

5.3.14.4. No in-combination impact is expected in relation to injury or disturbance due to the location of this European Site (more than 26km from any of the Preferred Project) and use of standard best practice guidance (JNCC, 2010a&b).

5.3.14.5. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.14.6. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Pembrokeshire Marine/Sir SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Pembrokeshire Marine/Sir SAC, alone or in-combination with other plans and projects.

5.3.15. Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC

5.3.15.1. The Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC is a SAC designated for the conservation of grey seal and bottlenose dolphin. The features have maintain conservation objectives and are currently in favourable condition.

5.3.15.2. Section 4.20.2 to 4.20.17 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, above water noise, toxic contaminants, electromagnetic fields, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

- 5.3.15.3. The Primary Assessment (RIAA Appendix I) found that, with the exception of underwater noise, all screened in pressures would lead to a negligible impact on these species at any population scale. The Secondary Assessment (RIAA Appendix I) included an estimate of the number of individuals likely to be present within a 500m injury radius of any location within each of the Preferred Projects. This did not exceed 1 animal at any of the Preferred Projects. The Secondary Assessment also found that the impact associated with disturbance would be negligible for both features because the European Site lies more than 26km from the closest Preferred Project.
- 5.3.15.4. No in-combination impact is expected in relation to injury or disturbance due to the location of this European Site (more than 26km from any of the Preferred Project) and use of standard best practice guidance (JNCC, 2010a&b).
- 5.3.15.5. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.15.6. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, alone or in-combination with other plans and projects.
- 5.3.16. Rannoch Moor SAC**
- 5.3.16.1. The Rannoch Moor SAC is a SAC designated for the conservation of freshwater pearl mussel. The feature has a maintain or restore conservation objective and is currently in unfavourable condition.
- 5.3.16.2. Section 4.21.2 to 4.21.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying feature of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.16.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects as all screened pressures would have a negligible impact on the species at any population scale
- 5.3.16.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Rannoch Moor SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Rannoch Moor SAC, alone or in-combination with other plans and projects.
- 5.3.17. River Avon SAC**
- 5.3.17.1. The River Avon SAC is a SAC designated for the conservation of Atlantic salmon. The feature has a maintain or restore conservation objective and is currently in unfavourable recovering/favourable condition.
- 5.3.17.2. Section 4.22.2 to 4.22.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan.

This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

- 5.3.17.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.17.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Avon SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of River Avon SAC, alone or in-combination with other plans and projects.
- 5.3.18. River Bladnoch SAC**
- 5.3.18.1. The River Bladnoch SAC is a SAC designated for the conservation Atlantic salmon. The feature has a restore conservation objective and is currently in unfavourable recovering condition.
- 5.3.18.2. Section 4.23.2 to 4.23.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.18.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.18.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect River Bladnoch SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of River Bladnoch SAC, alone or in-combination with other plans and projects.
- 5.3.19. River Camel SAC**
- 5.3.19.1. The River Camel SAC is a SAC designated for the conservation of Atlantic salmon. The feature has a maintain or restore conservation objective and is currently in unfavourable no change/ unfavourable recovering condition.
- 5.3.19.2. Section 4.24.2 to 4.24.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.19.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.19.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect River Camel SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of River Camel SAC, alone or in-combination with other plans and projects.

5.3.20. River Clun SAC

5.3.20.1. The River Clun SAC is a SAC designated for the conservation of freshwater pearl mussel. The feature has a maintain or restore conservation objective and is currently in unfavourable condition.

5.3.20.2. Section 4.25.2 to 4.25.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying feature of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.20.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.20.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Clun SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of River Clun SAC, alone or in-combination with other plans and projects.

5.3.21. River Dee and Bala Lake SAC / Afon Dyfrdwy a Lyn Tegid SAC

5.3.21.1. The River Dee and Bala Lake SAC / Afon Dyfrdwy a Lyn Tegid SAC is a SAC designated for the conservation of river lamprey, sea lamprey, Atlantic salmon, as well as other Annex II species (Screening Report, Appendix C) not considered within this AA. The features are currently in unfavourable condition with maintain or restore conservation objectives.

5.3.21.2. Section 4.26.2 to 4.26.9 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.21.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.21.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Dee and Bala Lake SAC / Afon Dyfrdwy a Lyn Tegid SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of River Dee and Bala Lake SAC / Afon Dyfrdwy a Lyn Tegid SAC, alone or in-combination with other plans and projects.

5.3.22. River Dee SAC

5.3.22.1. The River Dee SAC is a SAC designated for the conservation of Atlantic salmon and freshwater pearl mussel. The condition of the features is favourable maintained (salmon) and unfavourable declining

(freshwater pearl mussel) and their conservation objectives are to maintain (salmon) and restore (freshwater pearl mussel).

5.3.22.2. Section 4.27.2 to 4.27.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.22.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.22.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Dee SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the River Dee SAC, alone or in-combination with other plans and projects.

5.3.23. **River Derwent and Bassenthwaite Lake SAC**

5.3.23.1. The River Derwent and Bassenthwaite Lake SAC is a SAC designated for the conservation of river lamprey, sea lamprey, Atlantic salmon, as well as other Annex II species (Screening Report, Appendix C) not considered within this AA. The features are currently in unfavourable recovering/ unfavourable no change / favourable condition with maintain or restore conservation objectives.

5.3.23.2. Section 4.28.2 to 4.28.9 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.23.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.23.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Derwent and Bassenthwaite Lake SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the River Derwent and Bassenthwaite Lake SAC, alone or in-combination with other plans and projects.

5.3.24. **River Eden SAC**

5.3.24.1. River Eden SAC is a SAC designated for the conservation of river lamprey, sea lamprey and Atlantic salmon. The features are currently in unfavourable recovering/ unfavourable no change / favourable condition with maintain or restore conservation objectives.

5.3.24.2. Section 4.29.2 to 4.29.9 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were

identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.24.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.24.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Eden SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the River Eden SAC, alone or in-combination with other plans and projects.

5.3.25. River Ehen SAC

5.3.25.1. The River Ehen SAC is a SAC designated for the conservation of Atlantic salmon and freshwater pearl mussel. The condition of the features is unfavourable no change (salmon) and unfavourable declining (freshwater pearl mussel) both with a restore conservation objective.

5.3.25.2. Section 4.30.2 to 4.30.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.25.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.25.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Ehen SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the River Ehen SAC, alone or in-combination with other plans and projects.

5.3.26. River Evelix SAC

5.3.26.1. The River Evelix SAC is a SAC designated for the conservation of freshwater pearl mussel. The feature has a maintain conservation objective and is currently in unfavourable declining condition.

5.3.26.2. Section 4.31.2 to 4.31.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying feature of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.26.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.26.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Evelix SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the River Evelix SAC, alone or in-combination with other plans and projects.

5.3.27. River Faughan and Tributaries SAC

- 5.3.27.1. The River Faughan and Tributaries SAC is a SAC designated for the conservation of Atlantic salmon. The feature has a maintain conservation objective and but no condition assessment is available.
- 5.3.27.2. Section 4.32.2 to 4.32.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.27.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.27.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Faughan and Tributaries SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the River Faughan and Tributaries SAC, alone or in-combination with other plans and projects.

5.3.28. River Foyle and Tributaries SAC

- 5.3.28.1. The River Foyle and Tributaries SAC is a SAC designated for the conservation of Atlantic salmon. The feature has a maintain conservation objective and but no condition assessment is available.
- 5.3.28.2. Section 4.33.2 to 4.33.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.28.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.28.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Foyle and Tributaries SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the River Foyle and Tributaries SAC, alone or in-combination with other plans and projects.

5.3.29. River Kent SAC

- 5.3.29.1. The River Kent SAC is a SAC designated for the conservation of freshwater pearl mussel. The feature has a maintain or restore conservation objective and is currently in unfavourable condition.
- 5.3.29.2. Section 4.34.2 to 4.34.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying feature of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

- 5.3.29.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.29.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Kent SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the River Kent SAC, alone or in-combination with other plans and projects.
- 5.3.30. River Oykel SAC**
- 5.3.30.1. The River Oykel SAC is a SAC designated for the conservation of Atlantic salmon and freshwater pearl mussel. The condition of the features is unfavourable no change (freshwater pearl mussel) and favourable recovered (salmon) with a restore (freshwater pearl mussel) and maintain (salmon) conservation objectives.
- 5.3.30.2. Section 4.35.2 to 4.35.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.30.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.30.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Oykel SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the River Oykel SAC, alone or in-combination with other plans and projects.
- 5.3.31. River Roe and Tributaries SAC**
- 5.3.31.1. The River Roe and Tributaries SAC is a SAC designated for the conservation of Atlantic salmon. The feature has a maintain conservation objective but no condition assessment is available.
- 5.3.31.2. Section 4.36.2 to 4.36.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.31.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.31.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Roe and Tributaries SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the River Roe and Tributaries SAC, alone or in-combination with other plans and projects.

5.3.32. River South Esk SAC

- 5.3.32.1. The River South Esk SAC is a SAC designated for the conservation of Atlantic salmon and freshwater pearl mussel. The condition of the features is unfavourable recovering (salmon) and unfavourable no change (freshwater pearl mussel), both have a restore conservation objective.
- 5.3.32.2. Section 4.37.2 to 4.37.6 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.32.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.32.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River South Esk SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of River South Esk SAC, alone or in-combination with other plans and projects.

5.3.33. River Spey SAC

- 5.3.33.1. The River Spey SAC is a SAC designated for the conservation of Atlantic salmon and freshwater pearl mussel. The condition of the features is unfavourable recovering (salmon) and unfavourable declining (freshwater pearl mussel), both have a restore conservation objective.
- 5.3.33.2. Section 4.38.2 to 4.38.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.33.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.33.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Spey SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of River Spey SAC, alone or in-combination with other plans and projects.

5.3.34. River Tay SAC

- 5.3.34.1. The River Tay SAC is a SAC designated for the conservation of Atlantic salmon. The condition of the feature is favourable maintained with a maintain conservation objective.
- 5.3.34.2. Section 4.39.2 to 4.39.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.34.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.34.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Tay SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of River Tay SAC, alone or in-combination with other plans and projects.

5.3.35. River Teith SAC

5.3.35.1. The River Teith SAC is a SAC designated for the conservation of Atlantic salmon. The condition of the feature is unfavourable recovering with a maintain conservation objective.

5.3.35.2. Section 4.40.2 to 4.40.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.35.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.35.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Teith SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of River Teith SAC, alone or in-combination with other plans and projects.

5.3.36. River Tweed SAC

5.3.36.1. The River Tweed SAC is a SAC designated for the conservation of Atlantic salmon, as well as other Annex II species (Screening Report, Appendix C) not considered within this AA. The condition of the feature is favourable with a maintain conservation objective.

5.3.36.2. Section 4.41.2 to 4.41.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.3.36.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.3.36.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Tweed SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of River Tweed SAC, alone or in-combination with other plans and projects.

5.3.37. River Usk SAC/Afon Wysg SAC

- 5.3.37.1. The River Usk SAC/Afon Wysg is a SAC designated for the conservation of Atlantic salmon. The condition of the feature is unfavourable (unclassified) with a maintain or restore conservation objective.
- 5.3.37.2. Section 4.42.2 to 4.42.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.37.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.37.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Usk SAC/Afon Wysg SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the River Usk SAC/Afon Wysg SAC, alone or in-combination with other plans and projects.
- 5.3.38. River Wye/ Afon Gwy SAC**
- 5.3.38.1. The River Wye/ Afon Gwy SAC is a SAC designated for the conservation of Atlantic salmon, as well as other Annex II species (Screening Report, Appendix C) not considered within this AA. The condition of the feature is unfavourable (unclassified) with a restore conservation objective.
- 5.3.38.2. Section 4.43.2 to 4.43.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.38.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.38.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to River Wye/ Afon Gwy SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of the River Wye/ Afon Gwy SAC alone or in-combination with other plans and projects.
- 5.3.39. Solway Firth SAC**
- 5.3.39.1. Solway Firth SAC is a SAC designated for the conservation of river lamprey and sea lamprey. The condition of the features are not recorded with a maintain or restore conservation objective.
- 5.3.39.2. Section 4.45.2 to 4.45.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

- 5.3.39.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.39.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Solway Firth SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Solway Firth SAC alone or in-combination with other plans and projects.
- 5.3.40. Southern North Sea SAC**
- 5.3.40.1. The Southern North Sea SAC is a SAC designated for the conservation of harbour porpoise. The feature has a maintain conservation objective and is currently in favourable condition.
- 5.3.40.2. Section 4.46.2 to 4.46.10 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.40.3. The Primary Assessment (RIAA Appendix I) found that, with the exception of underwater noise, all screened in pressures would lead to a negligible impact on this species at any population scale. The Secondary Assessment (RIAA Appendix I) included an estimate of the number of individuals likely to be present within a 500m injury radius of any location within each of the Preferred Projects. This did not exceed 1 animal at any of the Preferred Projects. The Secondary Assessment found that impacts associated with disturbance could be detrimental under certain scenarios, as such Preferred Bidders (1-3) must produce and implement a Site Integrity Plan ("SIP"). The SIP must contain suitable measures to stay within the noise disturbance thresholds which are defined within JNCC (2020) guidance as 20% of the relevant area of the site in any given day or an average of 10% of the relevant area of the site over a season.
- 5.3.40.4. No in-combination impact is expected in relation to injury due to the use of standard best practice guidance (JNCC, 2010a&b). However as outlined above for noise disturbance, an impact of this order is also possible with the addition of impacts from other plans and projects. Such an impact could be reduced to acceptable levels with coordination of piling location and timing. However, The Crown Estate is not able to make such an assessment without detailed project specific information on construction programming. Therefore, Preferred Bidders (1-3) will be required to produce and implement a SIP.
- 5.3.40.5. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.40.6. Natural England and The Wildlife Trusts raised significant concerns regarding the suitability of SIPs from multiple projects without a robust procedure in place to manage the SIPs and reduce in-combination impacts to ensure a conclusion of no adverse effect on integrity can be made for the Southern North Sea SAC.
- 5.3.40.7. The Crown Estate considers the SIP to be an appropriate mechanism to provide a framework to ensure there is no adverse effect on the integrity of the Southern North Sea SAC. As a result of the concern

expressed by Natural England and The Wildlife Trusts around the robustness of the procedure at project level, The Crown Estate considers it appropriate for a Round 4 Strategic Site Integrity Plan ("SSIP") to be established for Preferred Projects 1, 2 and 3. The purpose of the Round 4 Strategic Site Integrity Plan is to set out the approach to be taken by Preferred Projects 1, 2 and 3 to provide certainty as to the conclusion of this AA's conclusion of no AEOSI in relation to the Southern North Sea SAC. The Round 4 SSIP will be secured through Agreements for Lease and must be agreed with The Crown Estate in consultation with the HRA EWG.

- 5.3.40.8. Natural England, BEIS and NRW disagreed with the use of 1km injury ranges for UXO detonation. NIRAS noted that recent modelling for clearance of various sized UXO does indicate potentially larger ranges and that text has been added to reference the recently published position statement on UXO clearance (Gov.uk, 2022). Guidance from Southall et al (2019) highlights injury ranges can be up to 15 km however it is acknowledged within the same guidance that 'The radius of the mitigation zone may be reduced, or increased, from the default 1 km if evidence supporting this change is accepted by the regulators following consultation with the appropriate nature conservation agency'. Such ranges would be informed by project specific modelling, once the type, size and location of UXO (if any) are known. The Round 4 SSIP will consider noise UXO detonation activities. Additionally, during the consenting process as a matter of law each project will be required to undertake an impact assessment, including project level HRA, where a LSE on a European site cannot be excluded beyond reasonable scientific doubt. This assessment will be used by the consenting body, as the competent authority, to undertake a statutory HRA, the outcome of which will ensure that the integrity of the European site will be safeguarded. Therefore, the uncertainties as to the level of effect (i.e. due to the lack of site-specific modelling data) will be addressed through the project level assessment. Notwithstanding this and after careful consideration of the issue, The Crown Estate considers the best available evidence has been used by NIRAS, that the assessment has been undertaken appropriately and that the remaining uncertainty will be addressed at project level (the approach to which is described in the paragraphs under heading 4.4), which will ensure that the integrity of the European site will be safeguarded.
- 5.3.40.9. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Southern North Sea SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Southern North Sea SAC alone or in-combination with other plans and projects.
- 5.3.41. **The Wash and North Norfolk Coast SAC**
- 5.3.41.1. The Wash and North Norfolk Coast SAC is a SAC designated for the conservation of harbour seal. The feature has a maintain conservation objective and is currently in favourable condition.
- 5.3.41.2. Section 4.47.2 to 4.47.10 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.41.3. The Primary Assessment (RIAA Appendix I) found that, with the exception of underwater noise, all screened in pressures would lead to a negligible impact on this species at any population scale. The Secondary Assessment (RIAA Appendix I) included an estimate of the number of individuals likely to be present within a 500m injury radius of any location within each of the Preferred Projects. This did not

exceed 1 animal at any of the Preferred Projects. The Secondary Assessment also found that the impact associated with disturbance would be negligible for harbour seal because the European Site lies more than 26km from the closest Preferred Project.

- 5.3.41.4. No in-combination impact is expected in relation to injury or disturbance due to the location of this European Site (more than 26km from any of the Preferred Project) and use of standard best practice guidance (JNCC, 2010a&b).
- 5.3.41.5. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.41.6. Natural England, JNCC and BEIS raised concerns with the declining condition of harbour seal feature at The Wash and North Norfolk Coast SAC. Natural England noted the feature has recently become unfavourable, due to the observed 20-30% decline in harbour seal numbers in the Wash in 2019-2020 and are in the process of updating conservation advice for this site. Following a review and consideration of the feedback from Natural England, JNCC and BEIS, NIRAS updated the European Site condition to 'medium', however individual sensitivity to disturbance and at sea density data remains unchanged and therefore the conclusion of no AEOSI remains valid. The Crown Estate considers that the assessment has used the best available evidence and has been undertaken appropriately.
- 5.3.41.7. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to The Wash and North Norfolk Coast SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of The Wash and North Norfolk Coast SAC alone or in-combination with other plans and projects.
- 5.3.42. Upper Ballinderry River SAC**
- 5.3.42.1. The Upper Ballinderry River SAC is a SAC designated for the conservation of freshwater pearl mussel. The condition of the feature is not currently available however the feature has a maintain or restore conservation objective.
- 5.3.42.2. Section 4.48.2 to 4.84.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying feature of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.42.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.42.4. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Upper Ballinderry River SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Upper Ballinderry River SAC alone or in-combination with other plans and projects.
- 5.3.43. West Wales / Gorllewin Cymru Forol SAC**

- 5.3.43.1. The West Wales / Gorllewin Cymru Forol SAC is a SAC designated for the conservation of harbour porpoise. The feature has a maintain conservation objective and is currently in favourable condition.
- 5.3.43.2. Section 4.49.2 to 4.49.10 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SAC screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, toxic contaminants, electromagnetic fields and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.3.43.3. The Primary Assessment (RIAA Appendix I) found that, with the exception of underwater noise, all screened in pressures would lead to a negligible impact on this species at any population scale. The Secondary Assessment (RIAA Appendix I) included an estimate of the number of individuals likely to be present within a 500m injury radius of any location within each of the Preferred Projects. This did not exceed 1 animal at any of the Preferred Projects. The Secondary Assessment also found that the impact associated with disturbance would be negligible for harbour porpoise because the European Site lies more than 26km from the closest Preferred Project.
- 5.3.43.4. No in-combination impact is expected in relation to injury or disturbance due to the location of this European Site (more than 26km from any of the Preferred Project) and use of standard best practice guidance (JNCC, 2010a&b).
- 5.3.43.5. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.3.43.6. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to West Wales / Gorllewin Cymru Forol SAC. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of West Wales / Gorllewin Cymru Forol SAC alone or in-combination with other plans and projects.

5.4. Birds

- 5.4.1. Within this section, for features screened in, The Crown Estate has undertaken a detailed review of the RIAA and where it has concluded that the actual number of collisions is less than 0.5% baseline mortality The Crown Estate agrees with the finding of the RIAA, that any impact will be negligible and that adverse effect on the integrity of the site as a result of the impact can be ruled out alone, or in-combination with other plans or projects.
- 5.4.2. The Crown Estate has taken this view as the effect on the feature is not likely to be significant, since 0.5% of baseline mortality represents a proportion of a population that it is so small that it is considered to be practically unmeasurable with any accuracy and, therefore, also considers there will be no in-combination effect. It is, therefore, judged that an impact of this magnitude is negligible by definition and can be discounted from requiring further assessment; consequently in these instances, no assessment is provided other than where specified for extenuating reasons in the assessment below. Below is a list of European Sites filtered out by this threshold:

- Alde-Ore Estuary SPA
- Farne Islands SPA
- Northumberland Marine SPA
- Northumbria Coast Ramsar
- Outer Firth of Forth and St. Andrews Bay Complex SPA
- St Abb's Head to Fast Castle SPA
- Strangford Lough Ramsar
- Upper Solway Flats & Marshes Ramsar

5.4.3. Ailsa Craig SPA

- 5.4.3.1. Ailsa Craig SPA is classified for the protection of gannet, lesser black-backed gull and kittiwake, as well as other Annex II species (Screening Report, Appendix C) not considered within this AA. The features have a maintain conservation objective and is currently in favourable (gannet), unfavourable no change (lesser black-backed gull) and unfavourable declining (kittiwake) condition. For lesser black-backed gull and kittiwake the predicted impacts are under the 0.5 % baseline mortality threshold and as such are not considered further – for further detail refer to the caveat in paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.
- 5.4.3.2. Section 4.50.2 to 4.50.16 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.4.3.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.3.4. For gannet the Primary Assessment (RIAA Appendix H) has found that, with the exception of collision risk and physical presence, all screened in pressures would lead to a negligible impact on this species at any population scale. The findings of the Secondary Assessment were that the combined impact of displacement and collision represents 0.21-1.06% of the baseline mortality at this European Site. NIRAS (2022) noted that Marine Scotland Science and NatureScot have previously advised that consideration of displacement impacts for gannet is not required as such impacts are not considered likely to result in an adverse effect on the site integrity of an SPA based on the findings of Searle et al (2014). NIRAS further concluded that for gannet the impact from the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.
- 5.4.3.5. The Primary Assessment (RIAA Appendix H) for lesser black-backed gull and kittiwake found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on these species at any population scale. In the Secondary Assessment (RIAA Appendix H), NIRAS (2022) concluded that the impact in terms of collision risk from the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.

5.4.3.6. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Alisa Craig SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Alisa Craig SPA alone or in-combination with other plans and projects.

5.4.4. Alde-Ore Estuary SPA

5.4.4.1. Alde-Ore Estuary SPA is classified for lesser black-backed gull. The condition of the feature is not currently available however the feature has a maintain or restore conservation objective. For lesser black-backed gull the predicted impact is under the 0.5 % baseline mortality threshold and as such is not considered further – for further detail refer to the caveat in paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.

5.4.4.2. Section 4.51.2 to 4.51.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.4.4.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.4.4.4. The Primary Assessment (RIAA Appendix H) for lesser black-backed gull found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. In the Secondary Assessment NIRAS (2022) concluded that the impact in terms of collision risk from the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.

5.4.4.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Alde-Ore Estuary SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Alde-Ore Estuary SPA alone or in-combination with other plans and projects.

5.4.5. Anglesey Terns/Morwenoliaid Ynys Môn SPA

5.4.5.1. Anglesey Terns/Morwenoliaid Ynys Môn SPA is classified for Sandwich tern and Arctic tern. The features have a maintain conservation objective and are currently in favourable condition.

5.4.5.2. Section 4.52.2 to 4.52.10 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

- 5.4.5.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.5.4. The Primary Assessment (RIAA Appendix H) for Arctic tern and Sandwich tern found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on these species at any population scale. The Secondary Assessment (RIAA Appendix H) provided evidence to demonstrate that a negligible number of birds are likely to utilise areas within the Round 4 Plan (NIRAS 2022). NIRAS (2022) concluded that the impact from the Round 4 Plan alone is considered to be negligible, and in view of the Primary Assessment any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.
- 5.4.5.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Anglesey Terns/Morwenoliaid Ynys Môn SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity to Anglesey Terns/Morwenoliaid Ynys Môn SPA alone or in-combination with other plans and projects.
- 5.4.6. Bowland Fells SPA**
- 5.4.6.1. Bowland Fells SPA is classified for lesser black-backed gull. The condition of the feature is not currently available however the feature has a maintain or restore conservation objective. For lesser black-backed gull the predicted impact is under the 0.5 % baseline mortality threshold and as such is not considered further – for further detail refer to paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.
- 5.4.6.2. Section 4.53.2 to 4.5.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.4.6.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.6.4. The Primary Assessment (RIAA Appendix H) for lesser black-backed gull found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. In the Secondary Assessment (RIAA Appendix H), NIRAS (2022) concluded that for lesser black-backed gull the impact in terms of collision risk from the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.
- 5.4.6.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Bowland Fells SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity to Bowland Fells SPA, alone or in-combination with other plans and projects.
- 5.4.7. Coquet Island SPA**

- 5.4.7.1. Coquet Island SPA is classified for lesser black-backed gull, kittiwake and puffin. The condition of the features is not currently available however they have a maintain / restore conservation objectives as part of a seabird assemblage. For kittiwake and puffin the predicted impacts are under the 0.5 % baseline mortality threshold and as such are not considered further – for further detail refer to paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.
- 5.4.7.2. Section 4.55.2 to 4.55.15 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.4.7.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.7.4. The Primary Assessment (RIAA Appendix H) for lesser black-backed gull found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. Despite the finding in the Secondary Assessment (RIAA Appendix H) that the predicted collision risk is likely to exceed the 1% baseline mortality threshold of the Coquet Island SPA population (14.8-16.5%), the actual number of collisions is considered to be negligible and likely indiscernible from background mortality, especially when the precaution incorporated into the assessment is taken into account. NIRAS (2022) concluded that for lesser black-backed gull the impact from the Round 4 Plan alone is considered to be negligible, and any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.
- 5.4.7.5. The Primary Assessment (RIAA Appendix H) also found that, with the exception of collision (kittiwake) and physical presence (puffin), all screened in pressures would lead to a negligible impact on these species at any population scale. In the Secondary Assessment (RIAA Appendix H), NIRAS (2022) concluded that the impact in terms of displacement and collision risk from the Round 4 Plan alone is considered to be negligible, and any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.
- 5.4.7.6. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Coquet Island SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity to Coquet Island SPA, alone or in-combination with other plans and projects.

5.4.8. Farne Islands SPA

- 5.4.8.1. Farne Islands SPA is classified for kittiwake and puffin. The condition of the features is not currently available however they have a maintain / restore conservation objective as part of a seabird assemblage. For kittiwake and puffin the predicted impacts are under the 0.5 % baseline mortality threshold and as such are not considered further – for further detail refer to the caveat in paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.
- 5.4.8.2. Section 4.58.2 to 4.58.10 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This

includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.4.8.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.4.8.4. The Primary Assessment (RIAA Appendix H) has found that, with the exception of collision risk (kittiwake) and physical presence (puffin), all screened in pressures would lead to a negligible impact on these species at any population scale. In the Secondary Assessment (RIAA Appendix H), NIRAS (2022) concluded that the impact in terms of displacement and collision risk from the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.

5.4.8.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Farne Islands SPA. The Crown Estate is, therefore, satisfied that the Round 4 Plan would not represent an AEOSI in respect of Farne Islands SPA.

5.4.9. Flamborough & Filey Coast SPA

5.4.9.1. Flamborough and Filey Coast SPA is classified for gannet, herring gull, kittiwake, common guillemot, razorbill and a breeding seabird assemblage that includes puffin. The condition of the kittiwake feature is classed as unfavourable; the condition of the other features is not currently available. Kittiwake has a 'maintain / restore' conservation objective, whilst the conservation objection is 'maintain' for all other features. For herring gull and razorbill the predicted impacts are under the 0.5 % baseline mortality threshold and as such are not considered further – for further detail refer to paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.

5.4.9.2. Section 4.59.2 to 4.59.26 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.4.9.3. NIRAS (2022) concluded that it was not possible to recommend that The Crown Estate's AA should conclude that the Round 4 Plan in-combination will not have an AEOSI at this European Site. This is due to the impact of collisions from the Round 4 Plan associated with the kittiwake feature, which is considered to make a material contribution to an in combination impact already causing an AEOSI.

5.4.9.4. Further, Natural England advised the risk of AEOSI should not be ruled out for gannet (in-combination), kittiwake (alone and in-combination), guillemot (in-combination), razorbill (in-combination) and puffin (in-combination). RSPB considered that AEOSI should not be ruled out for gannet, guillemot and puffin and that further assessment is needed for razorbill. The Wildlife Trusts advised that AEOSI should not be ruled out with regards to gannet. Natural England also raised concerns around the additional contribution of Hornsea Project Four to in-combination assessments, of which NIRAS have since updated within the RIAA.

- 5.4.9.5. For kittiwake the Primary Assessment (RIAA Appendix H) has found that, with the exception of collision risk all screened in pressures would lead to a negligible impact on this species at any population scale. The collision risk modelling within the Secondary Assessment (RIAA Appendix H) outlined the number of collisions apportioned to this European Site from the Round 4 Plan is estimated to be 37.9 – 43.4 collisions/annum. This represents 0.25-0.29% of the baseline mortality at this European Site. This figure is below the 0.5% threshold described in paragraphs 5.4.1. and 5.4.2. above. Due to the specific conditions of the colony at this site which is both in unfavourable condition and subject to a significant existing impact from offshore wind installations which have been found have an AEOSI in previous consent decisions, a more conservative approach presented in RIAA Appendix H has been considered and found that this impact could be as much as 94.3-108 collisions/annum, which equates to 0.63-0.72% of the baseline mortality. Population Viability Analysis predicts sustainable population growth of the Flamborough and Filey Coast SPA kittiwake population despite additional mortality from the Round 4 Plan alone. As highlighted in 5.4.9.4 Natural England were unable to conclude that the added kittiwake mortality that may arise from Round 4 alone would not pose any risk of an AEOSI of the European Site.
- 5.4.9.6. The in-combination assessment for kittiwake predicted the Round 4 Plan in-combination with other plans and projects impact is 557-563 collisions/annum. Population Viability Analysis predicts sustainable population growth of the Flamborough and Filey Coast SPA kittiwake population despite additional mortality from the Round 4 Plan in-combination with other plans and projects; however, after 60 years with this additional mortality the population would be 30.9-31.1% lower than compared to an unimpacted scenario. This impact has the potential to conflict with the conservation objectives of this feature to restore the population. As highlighted in 5.4.9.4 Natural England agreed that the impact calculated for the Round 4 Plan in-combination is considered to be unsustainable.
- 5.4.9.7. NIRAS (2022) concluded that for kittiwake, on this basis, the impact from the Round 4 Plan is considered to be sustainable alone but conflicting with conservation objectives in-combination with other plans and projects. Additionally in light of advice from Natural England on the most recent offshore windfarm planning applications, and in view of the decision made by the Secretary of State in relation to Hornsea Three's impacts on the kittiwake feature of this European Site, consideration was given to available mitigation options to reduce the impacts associated with the Round 4 Plan. This identified that the predicted impact of the Round 4 Plan can be reduced to an impact representing less than a 0.5% increase in baseline mortality under all scenarios considered by restricting turbine design (such as increasing minimum tip height) at Preferred Projects 1 and 2. It was further concluded that the reduction in collisions expected from mitigation options identified by NIRAS (2022) would still represent an AEOSI in-combination with other plans and projects that is considered to be unsustainable.
- 5.4.9.8. For gannet the Primary Assessment (RIAA Appendix H) has found that, with the exception of collision risk and physical presence, all screened in pressures would lead to a negligible impact on this species at any population scale. In the Secondary Assessment (RIAA Appendix H) the combined impact of displacement and collision represents 0.69-2.88% of the baseline mortality at this European Site. Population Viability Analysis predicted sustainable population growth of the Flamborough and Filey Coast SPA gannet population despite additional mortality from the Round 4 Plan alone.
- 5.4.9.9. NIRAS (2022) concluded that for gannet there is no AEOSI from the Round 4 Plan alone, and that the change in baseline mortality from the in-combination contribution from the Round 4 Plan would not be immaterial. The total mortalities from collision and displacement from the Round 4 Plan in-combination

with other plans and projects is 341.3 to 361.1 birds/annum. Population Viability Analysis predicted sustainable population growth of the Flamborough and Filey Coast SPA gannet population despite additional mortality from the Round 4 Plan in-combination with other plans and projects. As highlighted in 5.4.9.4 Natural England, RSPB and The Wildlife Trusts concluded that the risk of an AEOSI could not be ruled out beyond reasonable scientific doubt for gannet in relation to Round 4 plan in combination. Despite the identified sustainable population growth NIRAS (2022) undertook additional assessment on mitigation (linked to kittiwake feature) benefits to gannet from wind turbine design changes including raising the minimum tip height of projects on the east coast which have further reduced levels of impact.

- 5.4.9.10. The Primary Assessment (RIAA Appendix H) for guillemot found that, with the exception of physical presence, all screened in pressures would lead to a negligible impact on this species at any population scale. The Secondary Assessment (RIAA Appendix H) found that mortality associated with the number of displaced birds apportioned to this European Site from the Round 4 Plan is estimated to be 19.1 birds/annum. This represents 0.4% of the baseline mortality at this European Site. A more conservative approach presented in RIAA Appendix H found that this impact could be as much as 53.4 birds/annum, which represents 1.1% of the baseline mortality. Population Viability Analysis predicts sustainable population growth of the Flamborough and Filey Coast SPA guillemot population despite additional mortality from the Round 4 Plan alone.
- 5.4.9.11. NIRAS (2022) concluded that for guillemot there is no AEOSI from the Round 4 Plan alone, and that the change in baseline mortality from the in-combination contribution from the Round 4 Plan would not be immaterial. The in-combination assessment for guillemot identified the potential for other plans and projects to displace this feature. The impact predicted for the Round 4 Plan in-combination with other plans and projects is 520 birds/annum. Population Viability Analysis predicts sustainable population growth of the Flamborough and Filey Coast SPA guillemot population despite additional mortality from the Round 4 Plan in-combination with other plans and projects. As highlighted in 5.4.9.4 Natural England were not able to advise on the impact for the Round 4 Plan in-combination – due to Hornsea Four missing from the in-combination assessments. NIRAS have updated the RIAA to include Hornsea Four in the in-combination assessment and outlined that the conclusions have not changed and sustainable population growth of the guillemot population is expected.
- 5.4.9.12. The primary assessment for herring gull found that all screened in pressures would lead to a negligible impact on this species at any population scale. NIRAS (2022) concluded that for herring gull the impact from the Round 4 Plan alone is considered to be negligible, and that any additional impact from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.
- 5.4.9.13. For razorbill the Primary Assessment (RIAA Appendix H) has found that, with the exception of physical presence all screened in pressures would lead to a negligible impact on this species at any population scale. In the Secondary Assessment (RIAA Appendix H), NIRAS (2022) concluded that for razorbill the impact in terms of displacement from the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact. As highlighted in 5.4.9.4 Natural England agreed that alone that the Round 4 plan alone is unlikely to result in an AEOSI for Flamborough and Filey Coast SPA, however Natural England an adverse effect on site integrity could not be ruled out for razorbill in relation to Round 4 plan in combination.

- 5.4.9.14. The Primary Assessment (RIAA Appendix H) for puffin, part of the site's assemblage feature, has found that with the exception of physical presence, all screened in pressures would lead to a negligible impact on this species at any population scale. In the Secondary Assessment (RIAA Appendix H), the mortality associated with the number of displaced birds apportioned to this European Site from the Round 4 Plan is estimated to be between 0.5-4.5 birds/annum. This represents between 0.29-2.42% of the baseline mortality at this European Site. However, this is based on population estimates that are highly likely to have been underestimated, comparisons against the baseline mortality of the most recent population estimate suggest an impact of four birds actually represents 0.13-1.11% of the baseline mortality of the puffin population at the SPA. Actual displacement mortality predicted is low and there are considered to be significant assumptions which lead to over-estimation associated with the predicted displacement mortality. Population Viability Analysis predicts population decline of the Flamborough and Filey Coast SPA puffin population, with additional mortality from the Round 4 Plan alone the population would be 0.9-8.8% lower than compared to an unimpacted scenario after 60 years. As highlighted in 5.4.9.4 Natural England concluded that the risk of an adverse effect on site integrity could be ruled out for puffin, in relation to Round 4 plan alone.
- 5.4.9.15. NIRAS (2022) concluded that for puffin there is no AEOSI from the Round 4 Plan alone, and that the change in baseline mortality from the in-combination contribution from the Round 4 Plan would not be immaterial. The in-combination assessment for puffin identified the potential for other plans and projects to displace this feature. The impact predicted for the Round 4 Plan in-combination with other plans and projects is 6-36 birds/annum. Population Viability Analysis predicts population decline of the Flamborough and Filey Coast SPA puffin population, with additional mortality from the Round 4 Plan in-combination with other plans and projects the population would be 11.6-51.7% lower than compared to an unimpacted scenario after 60 years. Natural England have advised in previous assessments that impacts towards the lower end of the scale presented here should be considered and that impacts of that magnitude would mean that there is no indication of a predicted potential decline in the growth rate of the puffin population. Puffin was assessed on the basis that it is an un-named component of an assemblage feature, and The Crown Estate have sought clarification from Natural England on whether an assessment on this basis is appropriate and it has been confirmed that there is no conclusive evidence that puffin meet any criteria set out in Natural England's Supplementary Advice that would require it to be considered a main component of the breeding bird assemblage. NIRAS (2022) concluded that the magnitude of the impact predicted would not lead to an adverse effect on the assemblage of which it forms a part. This means that neither the abundance nor richness of the breeding seabird assemblage at the Flamborough and Filey Coast SPA would be reduced to the extent that it would cause an adverse effect on site integrity.
- 5.4.9.16. As highlighted in 5.4.9.4 Natural England concluded that the risk of an AEOSI could not be ruled out for puffin, in relation to Round 4 plan in combination, due to limited information on available evidence and the omission of Hornsea Four from the in-combination assessment. Since then, NIRAS updated the RIAA to include Hornsea Four in the in-combination assessment and outlined that, as Preferred Projects are in areas of low puffin densities, the conclusions have not changed and sustainable population growth of the puffin population is expected.
- 5.4.9.17. The Crown Estate has given significant weight to the comments made by Natural England, the RSPB and The Wildlife Trusts with respect to the Flamborough and Filey Coast SPA, as detailed above. The addition of Hornsea Four to the in-combination assessment undertaken by NIRAS and resulting conclusions has demonstrated sustainable population growth of guillemot and puffin populations are expected.

- 5.4.9.18. Concerns were raised over the results of PVA modelling which suggests future population declines could be significant for gannet, kittiwake, guillemot, razorbill (RSPB) and puffin (Natural England and RSPB) however there is sufficient uncertainty associated with PVA modelling. The PVA model is a very crude approximation of the behaviour of each population modelled and built on numerous assumptions and simplifications. It does not take account of any density dependent competition within breeding populations (which almost certainly operates in the large seabird colonies found in Britain). Second, any inaccuracies will compound when extrapolated over a 60 year period. It is considered that the model has low explanatory power over this very long time frame. Finally, there is no agreed method for interpreting the output metrics of the model which is typically done in a subjective way. As a matter of law, each individual project will be required to undertake a project level HRA, where a LSE on a European site cannot be excluded beyond once further detailed project design has been undertaken and more certainty is known about project impacts and appropriate mitigation. Therefore, the uncertainties as to the level of effect (i.e. due to the lack of site-specific data, the increasing knowledge base in relation to parameters used in modelling and the degree of connectivity between the Preferred Projects and the SPA) will be addressed through the project level assessment.
- 5.4.9.19. The Crown Estate considers that a meaningful assessment has been undertaken to the extent feasible on the best available evidence. The Crown Estate considers that the in combination assessment has been undertaken appropriately within the RIAA and has no remaining concerns for gannet, razorbill and puffin that prevent AEOSI being ruled out in relation to these features at Flamborough and Filey Coast SPA. The Crown Estate takes the view that the use of mitigation (including minimum tip height restrictions for Preferred Projects 1 and 2) will benefit other species (as highlighted within Annex H.6 for gannet) and as such agrees with the conclusions by NIRAS for gannet, razorbill, guillemot and puffin for the Flamborough and Filey Coast SPA that AEOSI can be ruled out for these features at the Flamborough and Filey Coast SPA alone and in-combination.
- 5.4.9.20. The Crown Estate has considered the ability to mitigate the impact on the Flamborough and Filey Coast SPA and has concluded that, based on the evidence currently available, it is possible to mitigate the impact alone to an acceptable level, but it is not possible to mitigate the in-combination impact to an acceptable level with regards to the kittiwake feature. The Crown Estate has, therefore, decided that it is unable to conclude that the Round 4 Plan will not adversely affect the integrity of the SPA and that the further tests set out in the Habitats Regulations must be considered. These include an assessment of alternative solutions, IROPI and environmental compensation.
- 5.4.10. Forth Islands SPA**
- 5.4.10.1. Forth Islands SPA is classified for gannet and kittiwake. The features have a maintain conservation objective and is currently in favourable maintained (gannet) and unfavourable declining (kittiwake) condition. For kittiwake the predicted impact is under the 0.5 % baseline mortality threshold and as such is not considered further – for further detail refer to the caveat in paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.
- 5.4.10.2. Section 4.60.2 to 4.60.11 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence,

underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

- 5.4.10.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.10.4. For gannet the Primary Assessment (RIAA Appendix H) has found that, with the exception of collision risk and physical presence, all screened in pressures would lead to a negligible impact on this species at any population scale. In the Secondary Assessment (RIAA Appendix H), the number of collisions apportioned to this European Site from the Round 4 Plan is estimated to be 3.6-4.4 collisions/annum. This represents 0.10-0.13% of the baseline mortality at this European Site. NIRAS (2022) noted that Marine Scotland Science and NatureScot have previously advised that consideration of displacement impacts for gannet is not required as such impacts are not considered likely to result in an adverse effect on the site integrity of an SPA based on the findings of Searle et al (2014). The number of mortalities associated with displaced birds apportioned to this European Site from the Round 4 Plan is estimated to 1.6-22.8 birds/annum. This represents 0.05-0.65% of the baseline mortality at this European Site.
- 5.4.10.5. JNCC raised in-combination effect concerns for gannet at Forth Islands SPA and outlined previous NatureScot advice regards to in-combination effects on gannet at Forth Islands SPA from Seagreen, Neart na Gaoithe and Inch Cape. NIRAS updated the RIAA to reflect this advice from NatureScot outlining that, the current level of in-combination mortality estimated for this feature at this European Site represents an adverse effect on the integrity of the SPA. NIRAS (2022) noted that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.
- 5.4.10.6. For kittiwake the Primary Assessment (RIAA Appendix H) has found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. NIRAS (2022) concluded that for kittiwake the impact from the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.
- 5.4.10.7. As highlighted above JNCC raised concerns around the in-combination assessment for gannet and outlined the potential usage of Preferred Projects 1 and 2 areas by gannet and that the risk of an AEOSI could not be ruled out in relation to Round 4 plan in combination, due to the combination of the Scottish Sectoral Marine Plan for Offshore Wind, and existing projects in the Forth/Tay area. JNCC highlighted that the HRA for the Sectoral Marine Plan could not rule out further adverse impacts on gannets from this European Site (resulting from development in Development Plan Options E1, E2 and E3 in combination with existing (and planned) projects at the time), based on available evidence. NIRAS (2022) confirmed the assessment assumed usage of the Preferred Project areas by gannet (foraging range) and added the above context to the RIAA however this does not affect the conclusions in respect of this European Site and its features.
- 5.4.10.8. The Crown Estate has given significant weight to the comments made by JNCC with respect to Forth Islands SPA, as detailed above following an update to the RIAA by NIRAS, The Crown Estate considers that the in combination assessment has been undertaken appropriately and after taking into account the views expressed by JNCC and has no remaining concerns for gannet at Forth Islands SPA.

5.4.10.9. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Forth Islands SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity to Forth Islands SPA, alone or in-combination with other plans and projects.

5.4.11. Greater Wash SPA

5.4.11.1. Greater Wash SPA is classified for Sandwich tern. The condition of the feature is not currently available however it has a maintain or restore conservation objective.

5.4.11.2. Section 4.61.2 to 4.61.6 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.4.11.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.4.11.4. For Sandwich tern the Primary Assessment (RIAA Appendix H) found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. The Secondary Assessment (RIAA Appendix H) provided evidence to demonstrate that a negligible number of birds are likely to interact, and therefore collide with, any of the Preferred Projects. NIRAS (2022) concluded that for Sandwich tern there is limited potential for the Round 4 Plan alone to contribute to any in-combination impact.

5.4.11.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Greater Wash SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity to Greater Wash SPA, alone or in-combination with other plans and projects.

5.4.12. Liverpool Bay SPA

5.4.12.1. Liverpool Bay SPA is classified for red-throated diver, cormorant, common scoter, red-breasted merganser and little gull. The features have a maintain or restore conservation objective and are currently in favourable (red-throated diver and common scoter) condition, the remaining features do not have a condition assessment available. For common scoter the predicted impact is under the 0.5 % baseline mortality threshold and as such is not considered further – for further detail refer to paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.

5.4.12.2. Section 4.66.2 to 4.66.19 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

- 5.4.12.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.12.4. The Primary Assessment (RIAA Appendix H) found that, with the exception of physical presence (red-throated diver and common scoter), all screened in pressures would lead to a negligible impact on these species at any population scale. Natural England have previously advised that for red-throated diver the current level of in-combination mortality estimated for this feature at this European Site represents an AEOSI of the SPA, but that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact. In the Secondary Assessment (RIAA Appendix H), NIRAS (2022) concluded that the impact in terms of displacement from the Round 4 Plan alone is considered to be negligible, and that the small change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.
- 5.4.12.5. For cormorant the Primary Assessment (RIAA Appendix H) found that all screened in pressures would lead to a negligible impact on this species at any population scale. NIRAS (2022) concluded that the impact from the Round 4 Plan alone is considered to be negligible, and that in view of the Primary Assessment, any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.
- 5.4.12.6. The Primary Assessment (RIAA Appendix H) for red-breasted merganser found that, with the exception of physical presence, all screened in pressures would lead to a negligible impact on this species at any population scale. The Secondary Assessment (RIAA Appendix H) provided evidence to demonstrate that a negligible number of birds are likely to utilise areas within the Round 4 Plan. NIRAS (2022) concluded that for red-breasted merganser the impact in terms of displacement from the Round 4 Plan alone is considered to be negligible, and in view of the Primary Assessment any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.
- 5.4.12.7. The Primary Assessment (RIAA Appendix H) for little gull found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. The collision risk modelling within the Secondary Assessment (RIAA Appendix H) outlined the number of un-apportioned collisions to this European Site from the Round 4 Plan is estimated to be 0.78 collisions/annum. This represents 1.23% of the baseline mortality at this European Site. If the collision risk estimate was apportioned to the European Site, the collision risk estimate would be much lower, and likely indiscernible from background mortality. NIRAS (2022) concluded that for little gull the impact from the Round 4 Plan alone is considered to be negligible, and any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.
- 5.4.12.8. Natural England and JNCC raised that the RIAA should quantitatively consider the overlap between red-throated diver and indirect habitat loss of the supporting habitat. NIRAS updated the RIAA to consider this and demonstrates minimal overlap of Preferred Project 5 and important habitat for red-throated diver. The Crown Estate considers that the assessment has been undertaken appropriately.
- 5.4.12.9. Natural England also raised the implications of vessel movement from Preferred Project 5 and interaction with Liverpool Bay SPA and the inability to conclude no appreciable difference to an in-combination impact. There are no details available at this stage of the location or magnitude of these activities. Additional measures will be implemented at project level, secured through the Round 4 Plan

Obligations Document “R4POD” (see 6.2.7 - 6.2.14), in relation to these activities, including, the agreement of an appropriate vessel traffic management plan which would typically include:

- Restricting vessel movements to existing navigation routes (where the densities of divers are typically relatively low);
- Where it is necessary to go outside of established navigational routes, selecting routes that avoid known aggregations of birds;
- 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, toolbox talks).

5.4.12.10. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Liverpool Bay SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity to Liverpool Bay SPA, alone or in-combination with other plans and projects.

5.4.13. Lough Neagh & Lough Beg Ramsar

5.4.13.1. Lough Neagh & Lough Beg Ramsar is designated for lesser black-backed gull. The condition of the feature and conservation objectives for the site are not currently available.

5.4.13.2. Section 4.67.2 to 4.67.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.4.13.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.4.13.4. The Primary Assessment (RIAA Appendix H) for lesser black-backed gull found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. The number of collisions apportioned to this European Site from the Round 4 Plan in the Secondary Assessment (RIAA Appendix H) is estimated to be 0.5-0.6 collisions/annum. This represents 0.52-0.58% of the baseline mortality at this European Site. The estimated number of collisions is considered to be negligible and more likely indiscernible from background mortality. NIRAS (2022) concluded that for lesser black-backed gull the impact from the Round 4 Plan alone is considered to be negligible, and in view of the Primary Assessment any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.

5.4.13.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Lough Neagh & Lough Beg Ramsar. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity to Lough Neagh & Lough Beg Ramsar, alone or in-combination with other plans and projects.

5.4.14. Mersey Narrows and North Wirral Foreshore SPA

- 5.4.14.1. Mersey Narrows and North Wirral Foreshore SPA is classified for common tern. The condition of the feature is not currently available however the feature has a maintain conservation objective.
- 5.4.14.2. Section 4.68.2 to 4.68.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to indirect physical, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.4.14.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.14.4. For common tern the Primary Assessment (RIAA Appendix H) found that all screened in pressures would lead to a negligible impact on this species at any population scale. NIRAS (2022) concluded that for common tern the impact from the Round 4 Plan alone is considered to be negligible, and that in view of the Primary Assessment, any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.
- 5.4.14.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Mersey Narrows and North Wirral Foreshore SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity to Mersey Narrows and North Wirral Foreshore SPA, alone or in-combination with other plans and projects.
- 5.4.15. Morecambe Bay Ramsar, Duddon Estuary Ramsar & Morecambe Bay and Duddon Estuary SPA**
- 5.4.15.1. Morecambe Bay Ramsar, Duddon Estuary Ramsar & Morecambe Bay and Duddon Estuary SPA are designated or classified for lesser black-backed gull, herring gull, Sandwich tern and black-headed gull. The condition of the features is not currently available however the features have maintain/restore conservation objectives. For herring gull the predicted impact is under the 0.5 % baseline mortality threshold and as such is not considered further – for further detail refer to the caveat in paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.
- 5.4.15.2. Section 4.69.2 to 4.69.17 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the Ramsar & SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.4.15.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.15.4. The Primary Assessment (RIAA Appendix H) for lesser black-backed gull found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. The predicted in-combination collision risk estimate in the Secondary Assessment (RIAA Appendix H) represents 6.25-6.27% of the baseline mortality of the lesser black-backed gull population of

the Morecambe Bay and Duddon Estuary SPA. NIRAS (2022) concluded that the impact from the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality from the in-combination contribution from the Round 4 Plan would not be immaterial. However, the values used to calculate the in-combination total (for both the Round 4 Plan and in-combination projects) reflect collision risk estimates that were made when the breeding population at Morecambe Bay was significantly higher than it is now. Collision rates calculated using current reduced densities will be substantially lower. An impact of this approximate magnitude has not previously been considered to represent an AEOSI (DECC, 2014), and the impact from the Round 4 Plan alone is not considered to represent an appreciable increase to this.

5.4.15.5. The Primary Assessment (RIAA Appendix H) for Sandwich tern found that with the exception of collision risk, all screened in pressures would lead to a negligible impact on these species at any population scale. The Secondary Assessment (RIAA Appendix H) provided evidence to demonstrate that a negligible number of birds are likely to utilise areas within the Round 4 Plan. NIRAS (2022) concluded the impact from the Round 4 Plan alone is considered to be negligible, and any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.

5.4.15.6. The Primary Assessment (RIAA Appendix H) for black-headed gull found that all screened in pressures would lead to a negligible impact on this species at any population scale. NIRAS (2022) concluded that the impact from the Round 4 Plan alone is considered to be negligible, and in view of the Primary Assessment any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.

5.4.15.7. BEIS raised concerns over the conclusion of no AEOSI with regards to lesser black-backed gull (alone and in-combination) for Morecambe Bay Ramsar, Duddon Estuary Ramsar & Morecambe Bay and Duddon Estuary SPA. This conclusion was reached with regard to previous assessments by DECC (2014) where impacts of higher magnitude concluded that the effect would not prevent the site from achieving favourable conservation status in line with the site's published conservation objectives (see paragraph 6.1.558 of RIAA Appendix H). The values used to calculate the in-combination total (for both the Round 4 Plan and in-combination projects) reflect collision risk estimates that were made when the breeding population at Morecambe Bay was significantly higher than it is now. Collision rates calculated using current reduced densities will be substantially lower, with the population size of the Protected Site having an exponential relationship with densities of birds. It was identified that the predicted mortalities were much lower than the population could withstand without experiencing a long term population decline. Similarly NIRAS (2022) outlined that the impact from the Round 4 Plan alone is not considered to represent an appreciable increase to this value. No concerns were raised by the SNCBs for this feature at this European Site. The Crown Estate therefore considers that the assessment has been undertaken appropriately.

5.4.15.8. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Morecambe Bay Ramsar, Duddon Estuary Ramsar & Morecambe Bay and Duddon Estuary SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity to Morecambe Bay Ramsar, Duddon Estuary Ramsar & Morecambe Bay and Duddon Estuary SPA, alone or in-combination with other plans and projects.

5.4.16. North Norfolk Coast Ramsar & SPA

5.4.16.1. North Norfolk Coast Ramsar & SPA is classified for Sandwich tern. The condition of the feature is not currently available however it has a maintain or restore conservation objective.

- 5.4.16.2. Section 4.71.2 to 4.71.6 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the Ramsar & SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.4.16.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.16.4. For Sandwich tern the Primary Assessment (RIAA Appendix H) found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. The Secondary Assessment (RIAA Appendix H) provided evidence to demonstrate that a negligible number of birds are likely to interact, and therefore collide with, any of the Preferred Projects. NIRAS (2022) concluded that for Sandwich tern there is limited potential for the Round 4 Plan alone to contribute to any in-combination impact.
- 5.4.16.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to North Norfolk Coast Ramsar & SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity to North Norfolk Coast Ramsar & SPA, alone or in-combination with other plans and projects.
- 5.4.17. Northumberland Marine SPA**
- 5.4.17.1. Northumberland Marine SPA is classified for lesser black-backed gull, kittiwake and puffin. The condition of the features is not currently available however they have a maintain / restore conservation objective. For lesser black-backed gull, kittiwake and puffin the predicted impacts are under the 0.5 % baseline mortality threshold and as such are not considered further – for further detail refer to paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality
- 5.4.17.2. Section 4.72.2 to 4.72.6 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.4.17.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.17.4. The Northumberland Marine SPA is classified to protect the sea areas used by the populations of birds designated as part of multiple SPAs (Coquet Island, Farne Islands, Lindisfarne and Northumbria Coast). As a result the predicted impacts and the assessment conclusions drawn for the constituent SPAs are considered equally applicable to the Northumberland Marine SPA. NIRAS (2022) concluded that for lesser black-backed gull, kittiwake and puffin, the impact from the Round 4 Plan alone is considered to be

negligible, and any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.

5.4.17.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Northumberland Marine SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity to Northumberland Marine SPA, alone or in-combination with other plans and projects.

5.4.18. Northumbria Coast Ramsar

5.4.18.1. Northumbria Coast Ramsar is designated for kittiwake, the predicted impact is under the 0.5 % baseline mortality threshold and as such is not considered further – for further detail refer to paragraphs 5.4.1 to for 5.4.2 consideration of baseline mortality.

5.4.18.2. Section 4.73.2 to 4.73.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the Ramsar screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.4.18.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.4.18.4. For kittiwake the Primary Assessment (RIAA Appendix H) has found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. In the Secondary Assessment NIRAS (2022) concluded that for kittiwake the impact in terms of collision risk from the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.

5.4.18.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Northumbria Coast Ramsar. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Northumberland Coast Ramsar, alone or in-combination with other plans and projects.

5.4.19. Outer Firth of Forth and St. Andrews Bay Complex SPA

5.4.19.1. Outer Firth of Forth and St. Andrews Bay Complex SPA is classified for gannet and kittiwake. The condition of the features is not currently available however they have a maintain / restore conservation objective. For gannet and kittiwake the predicted impacts are under the 0.5 % baseline mortality threshold and as such are not considered further – for further detail refer paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality

5.4.19.2. Section 4.74.2 to 4.74.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence,

underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.4.19.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.4.19.4. The Outer Firth of Forth and St. Andrews Bay Complex SPA is classified to protect the sea areas used by the populations of birds designated as part of multiple SPAs (Forth Islands and St Abbs's to Fast Castle). As a result the predicted impacts and the assessment conclusions drawn for the constituent SPAs are considered equally applicable to the Outer Firth of Forth and St. Andrews Bay Complex SPA. NIRAS (2022) concluded that for gannet and kittiwake, the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.

5.4.19.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Outer Firth of Forth and St. Andrews Bay Complex SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Outer Firth of Forth and St. Andrews Bay Complex SPA, alone or in-combination with other plans and projects.

5.4.20. Rathlin Island SPA

5.4.20.1. Rathlin Island SPA is classified for lesser black-backed gull, kittiwake and puffin. The features have a maintain or enhance conservation objective and are currently in favourable condition. For kittiwake and puffin the predicted impacts are under the 0.5 % baseline mortality threshold and as such are not considered further – for further detail refer to the caveat in paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.

5.4.20.2. Section 4.75.2 to 4.75.15 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.4.20.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.4.20.4. The Primary Assessment (RIAA Appendix H) for lesser black-backed gull found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. The collision risk modelling within the Secondary Assessment (RIAA Appendix H) outlined the number of collisions apportioned to this European Site from the Round 4 Plan is estimated to be 0.5-0.6 collisions/annum. This represents 1.47-1.64% of the baseline mortality at this European Site. It is considered highly unlikely that a significant proportion of lesser black-backed gull from Rathlin Island SPA will forage in the sea areas in which the Preferred Projects will be located. The value applied (10%) is considered to be highly precautionary with large gulls unlikely to be found foraging at distances offshore commensurate with the distance between Rathlin Island SPA and the Preferred Projects. Despite the

predicted collision risk exceeding the 1% baseline mortality threshold of the Rathlin Island SPA population, the actual number of collisions is considered to be negligible and likely indiscernible from background mortality, especially when the precaution incorporated into the assessment is taken into account. NIRAS (2022) concluded that for lesser black-backed gull the impact from the Round 4 Plan alone is considered to be negligible, and due to the low population associated with the site indiscernible from background mortality, and in view of the Primary Assessment any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.

5.4.20.5. The Primary Assessment (RIAA Appendix H) found that, with the exception of collision risk (kittiwake) and physical presence (puffin), all screened in pressures would lead to a negligible impact on these species at any population scale. In the Secondary Assessment NIRAS (2022) concluded that the impact in terms of collision risk and displacement from the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.

5.4.20.6. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Rathlin Island SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Rathlin Island SPA, alone or in-combination with other plans and projects.

5.4.21. Ribble & Alt Estuaries Ramsar & SPA

5.4.21.1. Ribble & Alt Estuaries Ramsar & SPA is classified for black-headed gull, lesser black-backed gull and common tern. The condition of the features is not currently available however the features have maintain/restore conservation objectives. For lesser black-backed gull the predicted impact is under the 0.5 % baseline mortality threshold and as such is not considered further – for further detail refer to paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.

5.4.21.2. Section 4.76.3 to 4.76.11 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the Ramsar & SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.4.21.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.4.21.4. The Primary Assessment (RIAA Appendix H) for lesser black-backed gull found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. In the Secondary Assessment (RIAA Appendix H), NIRAS (2022) concluded that for lesser black-backed gull the impact in terms of collision risk from the Round 4 Plan alone is considered to be negligible, and in view of the Primary Assessment any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.

5.4.21.5. The Primary Assessment (RIAA Appendix H) found that all screened in pressures for black-headed gull and common tern would lead to a negligible impact on these species at any population scale. NIRAS (2022) concluded that the impact from the Round 4 Plan alone is considered to be negligible, and

that any additional impact from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.

- 5.4.21.6. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Ribble & Alt Estuaries Ramsar & SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Ribble & Alt Estuaries Ramsar & SPA, alone or in-combination with other plans and projects.
- 5.4.22. Skomer, Skokholm and the Seas off Pembrokeshire SPA**
- 5.4.22.1. Skomer, Skokholm and the Seas off Pembrokeshire SPA is classified for storm petrel, lesser black-backed gull, kittiwake and puffin. The features have a maintain conservation objective and is currently in favourable (kittiwake and puffin), unfavourable (lesser black-backed gull) and unknown (storm petrel) condition. For lesser black-backed gull, kittiwake and puffin the predicted impacts are under the 0.5 % baseline mortality threshold and as such are not considered further – for further detail refer to the caveat in paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.
- 5.4.22.2. Section 4.79.2 to 4.79.17 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, physical presence, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.4.22.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.22.4. For storm petrel the Primary Assessment (RIAA Appendix H) found that all screened in pressures would lead to a negligible impact on this species at any population scale. NIRAS (2022) concluded that for storm petrel the impact from the Round 4 Plan alone is considered to be negligible, and that in view of the Primary Assessment, any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.
- 5.4.22.5. The Primary Assessment (RIAA Appendix H) found that, with the exception of collision risk (lesser black-backed gull and kittiwake) and physical presence (puffin), all screened in pressures would lead to a negligible impact on these species at any population scale. In the Secondary Assessment (RIAA Appendix H), NIRAS (2022) concluded that the impact in terms of collision risk and displacement from the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.
- 5.4.22.6. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Skomer, Skokholm and the Seas off Pembrokeshire SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Skomer, Skokholm and the Seas off Pembrokeshire SPA, alone or in-combination with other plans and projects.
- 5.4.23. St Abb's Head to Fast Castle SPA**

- 5.4.23.1. St Abb's Head to Fast Castle SPA is classified for kittiwake. The feature has a maintain conservation objective and is currently in unfavourable declining condition. For kittiwake the predicted impact is under the 0.5 % baseline mortality threshold and as such is not considered further – for further detail refer to paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.
- 5.4.23.2. Section 4.80.2 to 4.80.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.4.23.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.23.4. For kittiwake the Primary Assessment (RIAA Appendix H) has found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. In the Secondary Assessment (RIAA Appendix H), NIRAS (2022) concluded that for kittiwake the impact in terms of collision risk from the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.
- 5.4.23.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to St Abb's Head to Fast Castle SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of St Abb's Head to Fast Castle SPA, alone or in-combination with other plans and projects.
- 5.4.24. Strangford Lough Ramsar**
- 5.4.24.1. Strangford Lough Ramsar is designated for lesser black-backed gull, the predicted impact is under the 0.5 % baseline mortality threshold and as such is not considered further – for further detail refer to the caveat in paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.
- 5.4.24.2. Section 4.81.2 to 4.81.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the Ramsar screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.4.24.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.24.4. The Primary Assessment (RIAA Appendix H) for lesser black-backed gull found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. In the Secondary Assessment (RIAA Appendix H), NIRAS (2022) concluded that for

lesser black-backed gull the impact in terms of collision risk from the Round 4 Plan alone is considered to be negligible, and that the change in baseline mortality predicted from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.

5.4.24.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Strangford Lough Ramsar. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Strangford Lough Ramsar, alone or in-combination with other plans and projects.

5.4.25. The Wash Ramsar

5.4.25.1. The Wash Ramsar is designated for lesser black-backed gull. Section 4.82.2 to 4.82.7 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the Ramsar screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

5.4.25.2. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.

5.4.25.3. The Primary Assessment (RIAA Appendix H) for lesser black-backed gull found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on this species at any population scale. The collision risk modelling within the Secondary Assessment (RIAA Appendix H) outlined the number of collisions apportioned to this European Site from the Round 4 Plan is estimated to be 1.3-1.5 collisions /annum. This represents 0.41-0.47% of the baseline mortality at this European Site. A more conservative approach presented in RIAA Appendix H has found that this impact could be as much as 2.9-3.2 collisions/annum, which equates to 0.91-1.02 % of the baseline mortality. Despite this relatively high mortality rate, the actual number of collisions is considered to be negligible and more likely indiscernible from background mortality.

5.4.25.4. NIRAS (2022) concluded that for lesser black-backed gull the impact from the Round 4 Plan alone is considered to be negligible, and in view of the Primary Assessment any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.

5.4.25.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to The Wash Ramsar. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of The Wash Ramsar, alone or in-combination with other plans and projects.

5.4.26. Upper Solway Flats & Marshes Ramsar

5.4.26.1. Upper Solway Flats & Marshes Ramsar is designated for lesser black-backed gull and herring gull. For lesser black-backed gull and herring gull the predicted impacts are under the 0.5 % baseline mortality threshold and as such are not considered further – for further detail refer to the caveat in paragraphs 5.4.1 to 5.4.2 for consideration of baseline mortality.

5.4.26.2. Section 4.83.2 to 4.83.10 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan.

This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, collision, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.

- 5.4.26.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.26.4. The Primary Assessment (RIAA Appendix H) for lesser black-backed gull and herring gull found that, with the exception of collision risk, all screened in pressures would lead to a negligible impact on these species at any population scale. In the Secondary Assessment (RIAA Appendix H), NIRAS (2022) concluded that the impact in terms of collision risk from the Round 4 Plan alone is considered to be negligible, and that any additional impact from the Round 4 Plan alone is not expected to make an appreciable difference to any in-combination impact.
- 5.4.26.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Upper Solway Flats & Marshes Ramsar. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Upper Solway Flats & Marshes Ramsar, alone or in-combination with other plans and projects.
- 5.4.27. Ynys Seiriol/ Puffin Island SPA**
- 5.4.27.1. Ynys Seiriol/ Puffin Island SPA is classified for cormorant. The feature has a maintain or restore conservation objective and is currently in favourable condition.
- 5.4.27.2. Section 4.86.2 to 4.86.5 of the RIAA provides detailed assessment of the potential risk of AEOSI to the relevant qualifying features of the SPA screened into the assessment as a result of the Round 4 Plan. This includes an assessment of the potential risk of the plan arising from impact pathways that were identified relating to habitat loss/gain, direct physical, indirect physical, physical presence, underwater noise, above water noise, toxic contaminants, light and suspended sediments both alone, and in combination with other reasonably foreseeable plans and projects.
- 5.4.27.3. NIRAS (2022) concluded that there will be no significant or adverse effect on the ability of the site and its features to achieve its conservation objectives and favourable conservation status from the Round 4 Plan either alone, or in combination with other plans and projects.
- 5.4.27.4. For cormorant the Primary Assessment (RIAA Appendix H) found that all screened in pressures would lead to a negligible impact on this species at any population scale. NIRAS (2022) concluded that for cormorant the impact from the Round 4 Plan alone is considered to be negligible, and that in view of the Primary Assessment, any additional impact from the Round 4 Plan alone would not make an appreciable difference to any in-combination impact.
- 5.4.27.5. The Crown Estate agrees with conclusions of the RIAA (NIRAS, 2022) with respect to Ynys Seiriol/ Puffin Island SPA. The Crown Estate has therefore ascertained that the Round 4 Plan would not adversely affect the integrity of Ynys Seiriol/ Puffin Island SPA, alone or in-combination with other plans and projects.

6. Mitigation Measures

- 6.1.1. The Crown Estate has identified mitigation measures relevant to the Round 4 Plan to mitigate potential adverse effects on specific European Sites. In addition to mitigation measures secured at the plan level, mitigation has been identified in the assessment to be considered and implemented (if required) at the project level, where there is potential for a LSE on a European site from a Round 4 project.
- 6.1.2. A project level HRA will be required for individual projects arising from the Round 4 Plan as a matter of law. Individual projects must have due regard to the outcomes and recommendations of this AA in determining project specific mitigation measures that may be identified and implemented in the light of detailed project design and greater certainty about the magnitude of the effects that will be available at that stage.

6.2. Plan level mitigation

Export Cable Route

- 6.2.1. NIRAS (2022) undertook an Export Cable Region Assessment ("ECRA") for European Sites and features for which the Screening Report (NIRAS, 2021) identified a risk of LSE from an Export Cable Region. Due to the considerable uncertainty associated with cable routes for the Preferred Projects (not yet defined) the ECRA has taken a risk-based approach (consideration of both the vulnerability of features and the vulnerability of the Protected Sites) to the potential impacts arising from the installation of offshore wind farm export cables and their associated infrastructure. The Crown Estate has concluded that it is not possible to undertake a reasonable and meaningful assessment of cable route impacts due to this uncertainty.
- 6.2.2. Feature Vulnerability was determined on the basis of the feature's risk ("Feature risk") to the pressures screened in and the nature of a feature's interaction ("Feature Interaction") with the Export Cable Regions. For all features a risk score has been assigned to each pressure screened into the assessment (see Screening Report). Feature risks were scored as low, medium or high. The nature of a feature's interaction with the Export Cable Regions was also scored as low, medium or high, based on the receptor specific criteria.
- 6.2.3. For SACs and SPAs Protected Site Vulnerability was determined on the basis of the condition of the Protected Sites ("Protected Site Condition") and any other impacting activities (e.g. from different marine industries) present at each Protected Site that have the potential to interact in-combination ("Protected Site In-combination").
- 6.2.4. The ECRA has been used to evaluate the overall risk of an AEOSI from each Export Cable Region (and the Export Cable Regions collectively), alone and in-combination with other plans and projects. The assessment does not replace the information requirements of project level HRAs and does not attempt to pre-empt their conclusions.
- 6.2.5. The ECRA drafted by NIRAS (2022) is useful at the plan level, as it provides indicative forecasts of risk that can be used to identify where interventions are likely to be required at the project level. Outcomes of the ECRA include mitigation measures detailed below.
- 6.2.6. The ECRA outputs, as drafted by NIRAS (2022), has since been updated by The Crown Estate to account for complete spatial avoidance (a new 'high' category) and transitioned into a 'traffic-light system'. With the low risk features now 'green', low-medium and medium now 'amber', high now 'red' and a new 'black' category. The black category splits the previously high category into two categories – driven by review of the

ECRA results and feature vulnerability for habitats. The black category will require complete spatial avoidance of these habitat features.

6.2.7. The mitigation measures identified will be secured through the Agreements for Lease and leaseholders will be required to demonstrate compliance with the mitigation measures in order to obtain an Agreement for Lease for any transmission assets.

6.2.8. The following required will be secured:

- Requirement to consult: regardless of the overall risk score allocated to the features from the ECRA the requirement to consult with the MMO and/or NRW and relevant SNCBs and where appropriate non-statutory consultees (such as The Wildlife Trusts and RSPB) at the following stages;
 - initial Area of Search (AoS); and
 - route selection and refinement.
- Risk assessment results: dependant on the overall risk score allocated to the features from the ECRA there are categories of mitigation to be applied to the features. These include low, low-medium, medium, and high risks.
 - Green (low risk): no specific measures but activities to be undertaken in line with industry best practice (e.g. application of an environmental management plan, pollution control plan and spillage response plan, and adherence to international conventions such as International Convention for the Prevention of Pollution from Ships (MARPOL) and International Regulations for Preventing Collisions at Sea (COLREGS)).
 - Amber (low – medium risk): specific detail must be provided to The Crown Estate at the route selection and refinement stage. Cable route selection studies should be undertaken with a detailed evidence document provided outlining the process completed to identify the proposed export cable route(s) as well as feature specific information.
 - Red (high risk): affected developers must avoid irreparable damage (loss of a non-recoverable habitat) to these red risk features. Evidence should be submitted to The Crown Estate at the route selection and refinement stage outlining avoidance measures, mitigation and installation methods to reduce impacts depending on the type of risk.
 - Black (high risk): affected developers must spatially avoid these black risk features. Evidence should be submitted to The Crown Estate at the route selection and refinement stage outlining the avoidance of these features.

Marine Mammal Features

6.2.9. Where mortality or injury associated with underwater noise may occur in relation to all European Sites with marine mammals as features, project developers must adhere to industry guidelines:

- Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise (JNCC, 2010a); and
- JNCC guidelines for minimising the risk of injury to marine mammals from using explosives. (JNCC, 2010b).

Southern North Sea SAC

6.2.10. A Southern North Sea SAC Round 4 SSIP will be secured through Agreements for Lease, this will include strategic consideration of suitable measures and scheduling to ensure any development as a result of the Round 4 plan stays within the thresholds outlined Statutory Nature Conservations Body guidance (JNCC,

2020). It is expected that should projects gain development consent under the Planning Act 2008 this would then be replaced by a project level Site Integrity Plan.

Dogger Bank SAC

6.2.11. The HRA concludes there is habitat loss and damage from infrastructure on the sandbank habitat at Dogger Bank SAC based on the currently expected project design envelope, it is expected that project parameters would evolve and be refined based on site specific environmental survey data and following detailed engineering and design. To mitigate the impact on Dogger Bank SAC in so far as is possible, to reduce the amount of habitat loss and damage, project design restrictions have been implemented on Preferred Projects 1 and 2 to remove gravity base structures and suction caisson monopole foundations, and minimising rock protection as secondary cable protection within the SAC (RIAA Appendix J, Annex J.1). This will ultimately reduce the footprint of infrastructure for Preferred Projects 1 and 2 within the SAC. This mitigation is appropriate to reduce the level of impact on the sandbank feature within the SAC. Despite this reduction this does not allow AEOSI to be ruled out but reduces the impact on the feature of the site.

Flamborough and Filey Coast SPA

6.2.12. To reduce the collision risk levels of the Round 4 Plan an increase in wind turbine minimum tip height at Preferred Projects 1 and 2 (RIAA Appendix H, Annex H.6) up to a minimum that is technically achievable at the time of application for development consent, but no lower than 34 m is required. It should be noted that Preferred Project 3's project design envelope as submitted included a minimum tip height of 40 m. This mitigation is appropriate as evidence indicates kittiwake primarily fly below 30m and therefore the assessment undertaken by NIRAS (Annex H.6) has indicated this would reduce collisions from 108 collisions to 44.5 - 65.4. As a result of adding a minimum tip height restriction for kittiwake this will also benefit gannet. Assessment undertaken by NIRAS (Annex H.6) has indicated this would reduce collisions from 20.2 collisions to 7.8-11.7.

6.2.13. This mitigation reduces the level of impact on kittiwake so that AEOSI can be ruled out alone and the level of adverse effect in combination with other plans and projects is reduced.

Securing mitigation

6.2.14. The mitigation measures identified in this AA will be secured through Agreements for Lease for relevant Round 4 projects awarded rights as an outcome of this leasing process.

Unmitigable effects

6.2.15. It has not been possible to rule out an AEOSI for kittiwake at Flamborough and Filey Coast SPA in-combination and the sandbank features of Dogger Bank SAC, alone or in-combination.

6.2.16. Only two options remain for Flamborough and Filey Coast SPA and Dogger Bank SAC:

- the consideration of alternatives (including amendment to the plan); or
- explore the derogation provisions of the Habitats Regulations, i.e. if there are no feasible alternative solutions, whether there are IROPI for the plan to proceed, with the necessary compensatory measures secured in agreement with the relevant SNCB.

6.2.17. Therefore further consideration on whether the further tests set out in the Habitat Regulations can be met to allow the Round 4 Plan to proceed are presented in the Derogation Case Section.

6.3. Project specific mitigation

- 6.3.1. Table 5-1 of the RIAA (NIRAS 2022) identifies a list of impacts which require mitigation. Project level mitigation measures, if required, will be agreed with SNCBs and licensing authorities prior to consent. Any Agreement for Lease from The Crown Estate will stipulate that any future Lease is conditional upon gaining all relevant statutory consents; The Crown Estate will only issue a Lease once all necessary consents have been granted.
- 6.3.2. The Crown Estate expects developers responsible for Round 4 to undertake project level HRA, and in doing so, assess the effects referred to in the Round 4 Plan RIAA and identify the mitigation measures that are required. The Crown Estate further expects that developers will have due regard to the recommendations of the plan level HRA and the mitigations specified in Table 5-1 of that report. Furthermore, it is considered that whatever mitigation is required to avoid adverse effects can be applied at project level without compromising the viability of the Round 4 Plan.
- 6.3.3. The project design envelope for Preferred Projects 1 and 2 has been altered as mitigation with the primary objective to avoid or reduce harm. The spatial footprint of the turbines has been reduced (gravity based structures and suction caisson monopile foundations (reducing suction caisson jacket foundations) have been removed through project design restrictions) and minimising rock protection as secondary cable protection to reduce habitat loss and damage to the sandbank feature at Dogger Bank SAC. Additionally the minimum tip height of the turbines for these projects has been increased to what is technically achievable at the time of application for development consent, but no lower than 34 m above sea level to reduce the collision impact on the kittiwake feature at the Flamborough and Filey Coast SPA. These mitigations have the effect of reducing the amount of habitat loss at Dogger Bank SAC and reducing the number of collisions at Flamborough and Filey Coast SPA.

7. Conclusions

- 7.1.1. The Crown Estate has undertaken an AA of the effects of the proposed Round 4 Plan in respect of a number of European Sites and their qualifying features (as detailed in Appendix C of the Screening Report), and in consideration of their conservation objectives and the condition of the features. The Crown Estate has considered the information and analysis provided by NIRAS in the Principles Document, the Screening Report and the RIAA, and the advice from Natural England, Natural Resources Wales and JNCC and other stakeholders, including but not limited to The Wildlife Trusts and RSPB, provided over the course of the development of this HRA, to inform this Record of AA.
- 7.1.2. The Crown Estate considered the potential for AEOSI in respect of European Sites that may be affected by the plan, and other than Flamborough and Filey Coast SPA and Dogger Bank SAC, with the adoption of the mitigation measure identified in this AA, there is sufficient scope and flexibility for project specific mitigation measures to be applied at the project level by developers to ensure no AEOSI.
- 7.1.3. It has not been possible to rule out an AEOSI with regards to kittiwake at Flamborough and Filey Coast SPA in-combination and the sandbank feature of Dogger Bank SAC, alone or in-combination. Despite this a decision to restrict the project design envelope has been made, reducing the infrastructure footprint at the Dogger Bank SAC by restricting the use of gravity base structures, suction caisson monopile foundations and minimising cable protection for Preferred Projects 1 and 2. Mitigation has been applied by increasing the minimum tip height of the turbines at Preferred Projects 1 and 2 and maintaining Preferred Project 3 minimum tip height to reduce collision risk to kittiwake associated with the Flamborough and Filey Coast

SPA. Consideration is given to the further tests set out in the Habitat Regulations in the Derogation Case Section to determine whether the Round 4 Plan can proceed.

- 7.1.4. The assessment has identified a number of areas where it has not been possible to conduct a meaningful assessment due to the lack of key project specific information. An example UXO where injury ranges vary significantly depending on site specific conditions including location and water depth (as described in paragraph 5.3.40.8). As a matter of law, each project will be required to undertake an impact assessment, including project level HRA, where a LSE on a European Site cannot be excluded beyond reasonable scientific doubt. This assessment will take account of the detailed project design, informed by site-specific information, the distribution of the habitat features and their sensitivity to the proposed works. If necessary, project level HRA may also involve detailed site surveys and modelling work. The integrity of the European Site(s) will be safeguarded because no project will be awarded consent where it is considered that it will lead to an AEOSI in respect of a European Site unless a derogation case is sought on the basis that there are no alternative solutions and with the provision of evidence of IROPI and securing suitable compensation following the application of mitigation measures.
- 7.1.5. The views of stakeholders on the uncertainties of the Round 4 Plan, and its effects, as well as specific matters to be addressed by developers at project level will be provided to applicants that are awarded rights following the conclusion of the HRA process, and the Preferred Bidders will have regard to these in the development of the Round 4 Plan projects.
- 7.1.6. As such, The Crown Estate concludes that, with the exception of the Dogger Bank SAC and Flamborough and Filey Coast SPA, there will be no AEOSI in respect of any European Site, or the European Sites ability to achieve its conservation objectives as a result of the Round 4 Plan, both alone and in combination with other reasonably foreseeable plans and projects. With regards to the Dogger Bank SAC and Flamborough and Filey Coast SPA, given that The Crown Estate cannot exclude adverse effects on the integrity of these sites, consideration is given to the further tests set out in the Habitat Regulations in the Derogation Case Section to determine whether the Round 4 Plan can proceed.
- 7.1.7. The Crown Estate has also undertaken a Marine Conservation Zone assessment considering the features of sites designated under Part 5 of The Marine and Coastal Access Act 2008 separate to this HRA determining that there was no significant risk of hindering the conservation objectives.

8. Derogation Case

The Crown Estate has not found it possible to rule out an AEOSI with regards to kittiwake at Flamborough and Filey Coast SPA in-combination and the sandbank features of Dogger Bank SAC, alone or in-combination. However, The Crown Estate considers that there is a case for the Round 4 plan to proceed by means of a derogation on the basis that, in the absence of an alternative solution, that there are Imperative Reasons of Overriding Public Interest (IROPI) for the Round 4 Plan to proceed and compensatory measures necessary to ensure the overall coherence of the National Site Network can be secured. This is detailed below. As this is a HRA for the Round 4 Plan there are some acknowledged uncertainties that are subject to more detailed information that will not be available until detailed design and site specific surveys have been undertaken. As such, The Crown Estate have taken an approach to identify measures that will be available to compensate for adverse effects once the requirement is fully understood. In order to secure development consent, projects will be required to undergo project-level HRA and this will include assessment of project and site specific information.

8.1. Alternative Solutions

8.1.1. The Habitats Regulations provide that in circumstances where an adverse effect on the integrity of a European Site cannot be ruled out, the plan-making authority may, nevertheless, agree to the plan if it is satisfied that (there being no alternative solutions that would be less damaging to the European Site), the plan must be given effect for IROPI. This is known as a “derogation”.

8.1.2. Defra’s guide “Habitats regulations assessments: protecting a European site” (Defra, 2021) includes advice on the use of a derogation. In relation to the alternative solutions test, the guidance indicates that alternatives need to meet the original objectives of the proposal (in this case the Round 4 Plan); it goes on to state that an alternative solution is acceptable if it:

- achieves the same overall objective as the original proposal;
- is financially, legally and technically feasible; and
- is less damaging to the European Site and does not have an adverse effect on the integrity of this or any other European Site.

8.1.3. Therefore, the absence of feasible alternative solutions should be demonstrated before moving on to the next test for a derogation (IROPI).

8.1.4. The Crown Estate has considered the alternative solutions test following the established principles set out in The Habitat Regulations Assessment Handbook (Tyldesley and Chapman, 2013) to establish the presence or absence of alternative solutions:

Step 1 – define the objectives or purpose of the plan and the problem it is causing that needs to be solved, i.e. the harm that it would cause to the integrity of a European Site;

Step 2 – understand the need for the plan;

Step 3 – are there financially, legally and technically feasible alternative solutions;

Step 4 – are there alternative solutions with a lesser effect on the integrity of the European Site?

Step 1: Define the objectives or purpose of the plan and the problem it is causing

8.1.5. The key objectives of the Round 4 Plan are as follows:

1. To deliver at least 7 GW of new seabed rights in England and Wales.
2. To support the decarbonisation and security of UK electricity supply.
3. To facilitate the delivery of new offshore wind generation capacity in a timely manner to help meet UK government targets to cut greenhouse gas emissions to net zero by 2050.
4. To deliver greater volumes of low carbon electricity, as established by National Policy Statements EN-1 and EN-3, the UK government's Ten Point Plan for a Green Industrial Revolution¹, the Offshore Wind Sector Deal², the 2020 Energy White Paper³, the Climate Change Act 2008 (as amended).
5. To maximise social and economic opportunities for the UK from energy infrastructure investment and (respond to the Clean Growth Strategy (DBEIS 2017) and the UK "Offshore Wind Sector Deal" (DBEIS 2019)).
6. To support the UK's long-term plans for energy security and to increase domestic energy generation.

As noted in the AA, it has not been possible to rule out an AEOSI for kittiwake at Flamborough and Filey Coast SPA in-combination and the sandbank features of Dogger Bank SAC, alone or in-combination.

Step 2: Understand the need for the plan

8.1.6. With reference to the plan objectives above, the Round 4 Plan is needed to contribute to the UK's drive to meet its carbon reduction commitments. The Round 4 Plan supports decarbonisation and security of the UK's energy supply and government targets. Further detail relating to underpinning legislative drivers referred to within the objectives is provided below:

- Significant new offshore wind generation capacity is essential to help the UK meet its legally binding net zero by 2050 commitment (made through the Climate Change Act 2008 (2050 Target Amendment) Order 2019 - brought into force in June 2019 in response to recommendations by the Climate Change Committee (CCC) (CCC, 2019)) and interim carbon budgets.
- Additional new offshore wind generation capacity is required given the urgent need for greater volumes of low carbon electricity, and accelerating the transition from fossil fuels depends critically on how quickly new renewables including offshore wind can be rolled out. It is clear, that Round 4 is consistent with existing national policy in offering the potential of 7,980 MW of additional low carbon generation; it is also consistent with emerging national policy as evident from the consultation drafts of replacement National Policy Statements EN-1 and EN-3⁴ and the UK government's intention to strengthen the Renewable National Policy Statements to reflect the importance of energy security and net zero, as set out in the Energy Security Strategy (April 2022).

¹ <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution>

² <https://www.gov.uk/government/publications/offshore-wind-sector-deal>

³ <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

⁴ <https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-review-of-energy-national-policy-statements>

Steps 3 and 4: Are there financially, legally and technically feasible alternative solutions, and are there alternative solutions with a lesser effect on the integrity of the European Site?

8.1.7. The table below sets out the alternative solutions considered by The Crown Estate and summarises The Crown Estate's assessment of each solution.

Do nothing	<p>Not proceeding with the Round 4 Plan would remove the risk of impacts to the ornithological and benthic features identified to be at risk in the AA but would not meet the key objectives of the Round 4 Plan referred to above and in particular, to enable at least 7GW of new offshore wind rights in England and Wales; it would also hinder the wider need to deploy offshore wind generation at scale (50 GW⁵) before 2030 to help the UK meet its commitments under the Climate Change Act 2008 (as amended) and the UK's Nationally Determined Contribution (NDC) under the Paris Agreement to reduce greenhouse gas emissions by at least 68% from 1990 levels by 2030⁶. Not proceeding with the Round 4 Plan would also hinder the achievement of other aims and objectives of the British Energy Security Strategy (2022), including the ambition that by 2030 over half of the UK's renewable generation capacity will be from wind. Beyond the 2030 time horizon, the Government's Sixth Carbon Budget which was laid in legislation in April 2021 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. As part of this target, the Government's Net Zero Strategy commits to the decarbonisation of power generation by 2035⁷ and identifies Round 4 as a high level essential activity (Fig.16). In addition, in its proposed Sixth Carbon Budget, the Committee on Climate Change concluded that offshore wind is expected to become the "backbone" of the whole UK energy system, providing 65-70% of total generation by 2050; generating capacity for offshore wind is expected to be 100GW or more by 2050, with the CCC's five different scenarios ranging from 65GW to 140GW.</p> <p>In summary, there is an urgent need for renewable energy projects within the UK and accelerating the transition from fossil fuels depends critically on how quickly new renewables including offshore wind can be rolled out. The do nothing alternative solution would fail to meet the objectives of the Round 4 Plan and would erode the ability of the UK government to meet its 50GW by 2030 target, achieve its ambition that over half our renewable generation capacity will be from wind by 2030 and decarbonise power generation and reduce greenhouse gas emissions by 78% by 2035.</p>
Amend Round 4 and a Preferred Projects capacity	<p>Amending a Preferred Projects capacity from Round 4 would result in loss of capacity. It could reduce the risk of impacts to the ornithological and benthic features identified to be at risk in the AA but would not meet the objective of the Round 4 Plan to enable at least 7GW of new offshore wind rights in England and Wales (Objective 1); it would also hinder the wider need to deploy offshore wind generation at scale (50 GW) before</p>

⁵ <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy#renewables>

⁶ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/943618/uk-2030-ndc.pdf

⁷ <https://www.gov.uk/government/publications/net-zero-strategy>

	<p>2030 to help the UK meet its commitments under the Climate Change Act 2008 (as amended) and the UK's NDC under the Paris Agreement to reduce greenhouse gas emissions by at least 68% from 1990 levels by 2030 (Objective 4); as indicated above, the Government's objective to decarbonise power generation by 2035 and to reduce greenhouse gas emissions by 78% by 2035 would also be hindered, as well as the Government's aims and objectives in the British Energy Security Strategy (relevant to Objective 6). There is an urgent need for renewable energy projects within the UK and accelerating the transition from fossil fuels depends critically on how quickly new renewables including offshore wind can be rolled out.</p> <p>The objective of 7 GW is considered to be appropriately ambitious given the scale of the need, identified above, and the priority role offshore wind is afforded by national policy and, sense-checked against early Preferred Projects work was judged to be reasonable. Additionally, it is possible that the development process across the Round 4 Preferred Projects could result in capacity attrition for many different and as yet unidentified reasons (environmental, technical or commercial), noting the substantial attrition previously experienced with the loss of projects such as Atlantic Array, Rhiannon (the whole Irish Sea Zone) and the West of the Isle of Wight project. This remains the case notwithstanding the significant reduction in time for the consenting process proposed in the British Energy Security Strategy; currently the detail of this proposal is unknown and attrition occurs for reasons other than the time taken in the consenting process such as financial (too costly), construction (too challenging) or supply chain issues. Given the imperative to decarbonise energy as rapidly as practicable, delays to project developments must also be mitigated against by allowing for a greater than 7GW total capacity for Round 4 to maximise the offshore wind industry potential to realise the Government targets.</p> <p>Amending the capacity of a Preferred Project as an alternative solution would fail to meet the objectives of the Round 4 Plan and would erode the ability of the UK government to meet its greenhouse gas emissions reduction targets (including net zero), achieve its ambition that over half our renewable generation capacity will be from wind by 2030 and achieve its objective to decarbonise power generation by 2035.</p>
Remove Preferred Projects 1, 2 and 3	<p>Removing Preferred Projects 1, 2 and 3 from Round 4 would result in the award of three Preferred Projects with a combined capacity of 3,480MW. It would remove the risk of impacts to the ornithological and benthic features identified to be at risk in the AA but would not meet the objective of the Round 4 Plan to enable at least 7GW of new offshore wind rights in England and Wales (Objective 1); it would also hinder the wider need to deploy offshore wind generation at scale (50 GW) before 2030 to help the UK meet its commitments under the Climate Change Act 2008 (as amended) and the UK's NDC under the Paris Agreement to reduce greenhouse gas emissions by at least 68% from 1990 levels by 2030 (Objective 4); as indicated above, the Government's objective to decarbonise power generation by 2035 and to reduce greenhouse gas emissions by 78% by 2035 would also be hindered. There is an urgent need for renewable energy projects within the UK and accelerating the transition from fossil fuels depends critically on how quickly new renewables including offshore wind can be rolled out. Removal of Preferred Projects 1, 2 and 3 as an alternative solution would fail to meet the objectives of the Round 4 Plan and would erode the ability of</p>

	<p>the UK government to meet its greenhouse gas emissions reduction targets (including net zero), achieve the aims and objectives of the British Energy Security Strategy (including the ambition that over half our renewable generation capacity will be from wind by 2030) and achieve its objective to decarbonise power generation by 2035.</p>
<p>Amend Round 4 and award alternative or different areas of seabed to Preferred Bidders.</p>	<p>The Round 4 leasing process consists of five stages which in summary comprise the following:</p> <ol style="list-style-type: none"> 1. Pre-qualification Questionnaire (PQQ) which assessed potential Bidders' financial capability, technical experience and legal compliance, with successful Bidders pre-qualifying for the ITT Stage 1 process (becoming a Pre-qualified Bidder). 2. Invitation to Tender Stage 1 (ITT Stage 1) which assessed the financial and technical robustness of projects submitted by Pre-qualified Bidders. Bidder were required to submit projects in defined Bidding Areas. Projects that pass then become eligible to take part in the ITT Stage 2 process (becoming Eligible Bidders with Eligible Projects). 3. Invitation to Tender Stage 2 (ITT Stage 2) which was a multi-cycle bidding process in two phases, with issue of the ITT Stage 2 tender documentation in late 2020, followed by Bidding Cycles in early 2021. Using option fees bid by Eligible Bidders to determine award, one project was awarded per daily Bidding Cycle (working days only), with Bidding Cycles continuing until 7 GW was identified or exceeded (up to 8.5 GW) – in accordance with the rules of the tender. This process was completed in February 2021 and identified the Preferred Bidders and the six Preferred Projects [with a capacity of just under 8GW] that make up the Plan. 4. This Habitats Regulations Assessment – the plan-level HRA is undertaken by The Crown Estate in its role as a Competent Authority. 5. Subject to the outcome of the plan-level HRA, entry into Agreements for Lease with Preferred Bidders for the Preferred Projects. <p>The Round 4 leasing process does not allow for the award of rights in any additional areas of seabed or for the offering of new areas of seabed to Preferred Bidders and to run Offshore Wind Leasing Round 4 again would result in significant delays and result in the failure to meet Objective 3. This would also result in delayed lead-in times for Preferred Bidders hindering the deployment offshore wind generation at scale (50 GW) before 2030 to help the UK meet its commitments. There would be implications in delaying and would result in undermining The Crown Estates reputation for timely leasing. Therefore this alternative solution has a similar outcome to do nothing alternative solution and would fail to meet the objectives of the Round 4 Plan.</p> <p>In the event that alternative areas of seabed could have been offered to Preferred Bidders this does not take into account the detailed and rigorous site identification Preferred Projects took in order to participate in the Round 4. This included assessment of project locations in all Bidding Areas with the express intent to secure the maximum available capacity as a key component of offshore wind growth strategy. The rationale considered for the siting of preferred projects include, but is not limited to, the following considerations:</p>

	<ul style="list-style-type: none"> • The required size of the bidding area to support the project capacity according to the tender rules; • Environmental Sensitivities; • Distance from shore and length of export cable route; • Ground conditions; • Technical constraints including other infrastructure; and • Levelised Cost of Energy (LCOE) heat map showing substantial value differences.
Abandon Round 4 and re-start	<p>Not proceeding with the Round 4 Plan as it is currently or re-starting the process would remove the risk of impacts to the ornithological and benthic features identified to be at risk in the AA but would cause significant delay to meeting the objectives of the Round 4 Plan; it would also hinder the wider need to deploy offshore wind generation at scale (50 GW) before 2030 to help the UK meet its commitments under the Climate Change Act 2008 (as amended) and the UK's NDC under the Paris Agreement to reduce greenhouse gas emissions by at least 68% from 1990 levels by 2030⁸. Beyond the 2030 time horizon, the Government's Sixth Carbon Budget sets a target to reduce greenhouse gas emissions by 78% from 1990 to 2035 (including international aviation and shipping emissions); as part of this target, the Government's Net Zero Strategy commits to the decarbonisation of power generation by 2035 and identifies Round 4 as a high level essential activity (Fig.16). In addition, in its proposed Sixth Carbon Budget, the Committee on Climate Change concluded that offshore wind is expected to become the "backbone" of the whole UK energy system, providing 65-70% of total generation by 2050; generating capacity for offshore wind is expected to be 100GW or more by 2050, with the CCC's five different scenarios ranging from 65GW to 140GW. There is, therefore, an urgent need for renewable energy projects within the UK, and accelerating the transition from fossil fuels depends critically on how quickly new renewables including offshore wind can be rolled out. The re-start Round 4 alternative solution would erode the ability of the UK government to meet the various targets and objectives which form part of its Net Zero Strategy and achieve the aims of the British Energy Security Strategy (2022), including the ambition that over half our renewable generation capacity will be from wind by 2030. Therefore, this alternative solution has a similar outcome to do nothing alternative solution and would fail to meet Objective 4 and Objective 6 of the Round 4 Plan.</p>
Abandon Round 4 and rely on ScotWind and Floating Wind Leasing	<p>Not proceeding with the Round 4 Plan would remove the risk of impacts to the ornithological and benthic features identified to be at risk in the AA but would not meet the objectives of the Round 4 Plan namely, to enable at least 7GW of new offshore wind rights in England and Wales. It would also hinder the wider need to deploy offshore wind generation at scale (50 GW) before 2030 to help the UK meet its commitments under the Climate Change Act 2008 (as amended) and the UK's NDC under the Paris Agreement to reduce greenhouse gas emissions by at least 68% from 1990 levels by 2030¹⁰. Beyond the 2030 time horizon, the Government's Sixth Carbon Budget sets a target to reduce greenhouse gas emissions by 78% from 1990 to 2035</p>

⁸ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/943618/uk-2030-ndc.pdf

	<p>(including international aviation and shipping emissions); as part of this target, the Government's Net Zero Strategy commits to the decarbonisation of power generation by 2035 and identifies Round 4 as a high level essential activity (Fig.16). In addition, in its proposed Sixth Carbon Budget, the Committee on Climate Change concluded that offshore wind is expected to become the "backbone" of the whole UK energy system, providing 65-70% of total generation by 2050; generating capacity for offshore wind is expected to be 100GW or more by 2050, with the CCC's five different scenarios ranging from 65GW to 140GW. There is, therefore, an urgent need for renewable energy projects within the UK, and accelerating the transition from fossil fuels depends critically on how quickly new renewables including offshore wind can be rolled out. The Floating Wind leasing round in the Celtic Sea will be up to 4GW and the Sectoral Plan has assessed up to 10GW from ScotWind and the remaining 15GW are without further assessment. This alternative solution would fail to meet all of the objectives of the Round 4 Plan.</p>
Alternative Project Design Restrictions	<p>Changes to Preferred Projects 1 and 2 were made to:</p> <ul style="list-style-type: none"> • Reduce the amount of habitat loss and damage at Dogger Bank SAC on the sandbank feature, project design restrictions have been implemented to remove gravity base structures and suction caisson monopile foundations, and minimising rock protection as secondary cable protection within the SAC. • Mitigate potential adverse effects on kittiwake at Flamborough and Filey Coast SPA by increasing minimum tip height of turbines from 24 m up to a minimum that is technically achievable at the time of application for development consent, but no lower than 34 m as mitigation for adverse effects arising from collision risk. <p>Further alternative project designs were considered, such as layout of turbines within Preferred Project 1 and 2; such a restriction was considered inappropriate for a plan level HRA due to a lack of site specific information being available.</p> <p>The Crown Estate do not consider that a reduction of red line boundary would necessarily offer an reduction in impact as detailed design has not yet been undertaken and the number and location of turbines is not yet known. It is likely that the whole area will not be subject to development following detailed design and project refinement. Furthermore, a reduction in area may drive the need for larger turbines to meet the generation capacity and may have a knock on effect to SPA features, particularly kittiwake at Flamborough and Filey Coast for which impacts would also need to be mitigated for. There is also potential that larger turbines would require larger foundation pieces, including those The Crown Estate have identified to be restricted within Dogger Bank SAC due to technical feasibility, increasing the amount of habitat loss.</p> <p>Detailed project design is not known at the plan-level stage and would only be available once site specific survey work and detailed engineering and design work has been completed. Through the AA stage The Crown Estate has considered introducing feasible design restrictions that can reduce the impact on Dogger Bank SAC and Flamborough and Filey Coast SPA. Even with the inclusion of such restrictions and other forms of mitigation, The Crown Estate has concluded that in each case, an</p>

	adverse effect on site integrity cannot be excluded. The Crown Estate has not been able to identify any other alternative project design restrictions that would result in no AEOSI.
Offshore Wind Farms not in UK EEZ	Offshore wind farm projects that are located outside UK territorial waters are not an alternative to the Round 4 Plan as this would not meet the objective to support the decarbonisation of the UK electricity supply and UK commitments on offshore wind generation. 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.

Conclusion on Alternatives

8.1.8. The Crown Estate has considered a range of alternative solutions and has concluded that there are no feasible alternative solutions to the Round 4 Plan which meet the plan's objectives and which would lead to less harm to the affected European Sites.

8.1.9. Having identified the objectives of the Round 4 Plan and considered all alternative means of fulfilling these objectives, The Crown Estate is satisfied that no feasible alternative solutions with lesser effects are available.

8.2. Imperative Reasons of Overriding Public Interest (IROPI)

8.2.1. Having demonstrated the absence of alternative solutions, the HRA process provides that a plan (or project) having an adverse effect on the integrity of a European Site may (subject to there being no feasible alternative solutions and provision of necessary compensation) proceed if there are IROPI why the plan (or project) must, nevertheless, go ahead.

8.2.2. A number of in-principle grounds for IROPI are established through the derogation provisions and set out in guidance provided by Defra (Defra, 2021) and the European Commission (European Commission, 2019). It should be noted that where the site concerned hosts a priority natural habitat or a priority species, and those features are at risk of adverse effects, the grounds for IROPI should normally include human health, public safety or beneficial consequences of primary importance to the environment but may also be of a social or economic nature (subject to the opinion of the relevant national government in England or Wales). Neither feature (kittiwake at Flamborough and Filey Coast SPA or sandbanks at Dogger Bank SAC) are classed as priority habitats or species.

8.2.3. The guidance identifies the following principles for considerations of IROPI:

- Imperative: 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 objectives of the plan (or project) 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 European Sites are long term interests.
- Overriding: The public interest (which can be national, regional or local) of proceeding with the plan (or project) must be greater than the interest of conservation interest potentially put at risk should the plan or project go ahead.

Reasons of Public Interest

8.2.4. The Round 4 Plan will provide a significant contribution to limiting the extent of climate change in accordance with the objectives of the Paris Agreement and is essential for meeting the UK's NDC for the period 1 January 2021 - 31 December 2030. Renewables such as offshore wind will play a critical role in the transition away from fossil fuels, as outlined by the British Energy Security Strategy released in April 2022. Beyond the 2030 time horizon, the Government's Sixth Carbon Budget sets a target to reduce greenhouse gas emissions by 78% from 1990 to 2035 (including international aviation and shipping emissions)⁹; as part of this target, the Government's Net Zero Strategy commits to the decarbonisation of power generation by 2035¹⁰ and identifies Round 4 as a high level essential activity (Fig.16). In addition, in its proposed Sixth Carbon Budget, the Committee on Climate Change concluded that offshore wind is expected to become the "backbone" of the whole UK energy system, providing 65-70% of total generation by 2050; generating capacity for offshore wind is expected to be 100GW or more by 2050, with the CCC's five different scenarios ranging from 65GW to 140GW.

8.2.5. The consequences of not achieving the objectives of the Paris Agreement would be severely detrimental to societies across the globe and to human health, to social and economic interests and to the environment. Namely the increases in mean temperature in most land and ocean regions, hot extremes in most inhabited regions, heavy precipitation in several regions and the probability of drought and precipitation deficits in some regions. Sea level rise will continue and marine ice sheet instability in Antarctica or irreversible loss of the Greenland ice sheet could result in multi-metre rise in sea levels leading to extreme flooding (IPCC, 2018). Increasing the risks associated with sea level rise to small islands, low-lying coastal areas and deltas for many human and ecological systems (IPCC, 2018). Climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C (IPCC, 2018). The impacts of climate change are global in scope and unprecedented in human existence; the science linking the concentration of greenhouse gas emissions to average global temperature on Earth is without question.

8.2.6. The need to address climate change is established through the Climate Change Act 2008, the UK has a legal commitment to decarbonise with legally binding targets in place to cut emissions (versus 1990 baselines) by 34% by 2020 and 100% by 2050 (Net Zero). This commitment is further enshrined in the UK's NDC (reducing greenhouse gas emissions by at least 68% from 1990 levels by 2030) and through the UK Low Carbon Transition Plan and the UK Clean Growth Energy Strategy. In April 2022 the UK Government further reinforced its commitment to addressing climate change through the British Energy Security Strategy.

⁹ <https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035>

¹⁰ <https://www.gov.uk/government/publications/net-zero-strategy>

The Government's most recent Sixth Carbon Budget sets a target to reduce greenhouse gas emissions by 78% from 1990 to 2035 (including international aviation and shipping emissions). Round 4 will aid the government in the delivery of its strategy for decarbonisation and to achieve the legally binding commitments set out in the Climate Change Act 2008.

- 8.2.7. In March 2019, the UK 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 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 2019, the UK government committed to increase their ambition on offshore wind to 40 GW by 2030. In April 2022, the British Energy Security Statement was released and the UK Government further committed offshore wind to 50 GW by 2030. As noted in the Alternatives table above there is a need to have a plentiful pipeline due to the potential attrition of projects. 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; attrition occurs for reasons various reasons, including the time taken in the consenting process, financial reasons (too costly), construction reasons (too challenging) or supply chain issues. It is therefore not the case that the ambitions of the Sector Deal, nor the newly adopted government policy and British Energy Security Strategy, will certainly be met by those projects currently under consideration by developers. 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 Round 4 Plan, it is very possible that delivery of the Sector Deal and the UK government's 2030 ambition will fall short.
- 8.2.8. In October 2021, the UK government published The Net Zero Strategy: Build back Greener which sets out the measures the UK government plans to take to keep the UK on a path to net zero. The UK recently concluded that to reach these targets it 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. The Net Zero Strategy identifies Round 4 as a high level essential activity in the period to 2035 (Fig.16). Furthermore, in its proposed Sixth Carbon Budget, the Committee on Climate Change concluded that offshore wind is expected to become the "backbone" of the whole UK energy system, providing 65-70% of total generation by 2050; generating capacity for offshore wind is expected to be 100GW or more by 2050, with the CCC's five different scenarios ranging from 65GW to 140GW.
- 8.2.9. Key objectives (Objective 2 and Objective 6) of the Round 4 Plan is the security of UK electricity supply. The UK has committed to decarbonise the electricity system by 2035, subject to security of supply, focusing on 'home-grown technologies'. The energy minister Greg Hands noted, in November 2021, that a diverse source of renewable technologies will be key to ensuring the security of energy supply during the UK's transition to net zero. As the UK continues to move forward in renewable energy developments, to which the Round 4 Plan supports, there will be greater security of supply and reduced dependence on fossil fuels.
- 8.2.10. In April 2022, the UK Government published the British Energy Security Strategy which outlines the UK's long-term plans for greater energy security. The strategy includes various targets and ambitions, including raising the previous 40 GW by 2030 target to 50 GW by 2030, and the ambition that offshore wind will provide over half of the UK's renewable generation capacity by 2030. It is the UK Government's expectation, as outlined within the strategy, that the offshore wind sector will grow to support around 90,000 jobs by 2030, help to reduce cost of energy to individual households and help to reduce reliance on Russian energy through an increase domestic energy generation and clean jobs. The Round 4 Plan supports this strategy.

8.2.11. There is a clear public interest in the Round 4 Plan proceeding. The Round 4 Plan will provide a substantial contribution in the late 2020s towards achieving UK government policies, in particular achieving 50 GW by 2030 and as part of this target, the Government's Net Zero Strategy commitment to the decarbonisation of power generation by 2035. The Round 4 Plan implements national policy and will provide an essential public benefit.

Conservation Interest potentially at risk

Dogger Bank SAC

8.2.12. The Secondary Assessment calculated for habitat loss the impact from the Round 4 Plan alone is 2.035km², which equates to 0.016% of this features distribution within this the Dogger Bank SAC European Site. JNCC (undated) report that there are 20 sites in the UK where sandbanks which are slightly covered by sea water all the time (sandbanks) are a primary reason for site selection and a further 16 sites where this Annex I habitat is a qualifying feature, but not a primary reason for site selection - totalling 36 sites across the UK National Site Network.

8.2.13. Dogger Bank is understood to comprise more than 70% of the UK Annex I sandbank resource (Barnfield et al, 2021). Based on the figure for the total estimated area of Annex I sandbank in the UK of 17,090 km² (JNCC, 2013), Dogger Bank (area of 12,331 km² indicated in R4 HRA) is calculated to represent 72.2% of all UK Annex I sandbank resource. On this basis, loss of an estimated worst case 2.035 km² of sandbank habitat from Dogger Bank would represent 0.012% of total UK Annex I sandbank. This estimate may need to be considered in the context of the particular importance of Dogger Bank to the MPA network arising from the fact that Dogger Bank was formed by geological, glacial processes prior to being submerged through sea level rise and is therefore a different sub-type of Annex I sandbank feature compared to other sites (Barnfield et al, 2021).

8.2.14. All offshore sandbanks are within five SACs that all have restore conservation objectives for the Annex I feature and condition assessments (low confidence) undertaken suggest that sandbanks are highly disturbed due to widespread fishing (JNCC, 2019). Feature condition of Annex I sandbank habitats across the National Site Network is noted as under half of the coverage is in good condition (8260 km²) and over half is in not-good condition (8865km²) the remaining coverage condition was not known (15km²). JNCC (2019) noted that the short term trend of habitat area in good condition is decreasing and this based on mainly expert opinion with very limited data.

Flamborough and Filey Coast SPA

8.2.15. The worst case collision mortalities reported in the RIAA (not including mitigation) have been used (94.3-108) to establish percentage loss of kittiwake at the SPA. Using the population listed on the SPA citation results in 0.11-0.12% ($94.3-108/89,040 \times 100 = 0.11 - 0.12\%$); using the latest count data from Aitken et al (2017) results in 0.09 – 0.1% ($94.3-108/103,070 \times 100 = 0.09 - 0.1\%$). There are a total of 33 sites (as of 2016) across the UK National Site Network where kittiwake are a feature within an SPA.

8.2.16. Based on the figures above the total estimated impact from collision risk on kittiwake population, within the National Site Network, in the UK is 0.02%. This calculation is based on the UK SPA population as reported in Stroud et al. (2016). Stroud et al. (2016) noted that the long term (1985-1988 to 1998-2002) UK

trend for kittiwake demonstrates a 24.8% decline in population and in the short term (1999 to 2011) there was a 46.6% decline in UK populations.

Does the public interest 'override'?

8.2.17. The impacts outlined above for the sandbank feature at Dogger Bank SAC and kittiwake feature at Flamborough and Filey Coast SPA represent adverse effect to site integrity but considering the conservation interests across the UK National Site Network demonstrates that the percentage loss of these features is not significant across the UK. Annex I sandbanks slightly covered by seawater at all times are a relatively widespread habitat across the UK, however Dogger Bank SAC is a sub-type of Annex I sandbank (see 8.2.13) and is considered a one-of-a-kind habitat within the UK National Site Network, as such this carries a greater conservation interest than the main feature. Kittiwake have a widespread range across the UK but have experienced decline in abundance, with regional variations, since 1986. Abundance for the UK declined rapidly from 1995, reaching the lowest values in 2013. Since then abundances have increased overall but are still 50% below the 1986 baseline (JNCC, 2021). Due to the decline of kittiwake populations this increases the conservation interest of the feature.

8.2.18. However, the strategy to significantly increase offshore wind generating capacity is part of a fundamental national policy with long term public benefit which protects the environment and public health from the consequences of climate change and ensures public safety. In addition, the Round 4 Plan will:

- Provide a significant contribution to limiting the extent of climate change in accordance with the objectives of the Paris Agreement;
- Be essential for meeting the UK's NDC for the period 1 January 2021 - 31 December 2030;
- Help to achieve the UK government's ambitions in the British Energy Security Strategy (2022);
- Help to ensure the Government's Sixth Carbon Budget target is met to reduce greenhouse gas emissions by 78% from 1990 to 2035 (including international aviation and shipping emissions); and
- Help to enable the Government's Net Zero Strategy of decarbonisation of power generation by 2035.

8.2.19. The Crown Estate has considered if there are IROPI for the Round 4 Plan to proceed and is satisfied that there are IROPI for the Round 4 Plan to proceed. In arriving at this decision The Crown Estate has considered that the Round 4 Plan provides a public benefit which is essential and urgent despite the harm to the integrity of the kittiwake feature of the Flamborough and Filey Coast SPA and the sandbank feature at the Dogger Bank SAC.

8.2.20. Consequently, based on the reasons noted above The Crown Estate is satisfied that the Round 4 Plan is supported by IROPI related to human health, public safety or beneficial consequences of primary importance to the environment.

8.3. Compensatory Measures

8.3.1. The Crown Estate asked its technical advisors NIRAS to assess potential compensatory measures and provided a technical note (authored by NIRAS) on potential compensatory measures to the EWG for consultation in October 2021. This work identified a range of potential measures to compensate for the impact identified in the RIAA, without prejudice to outcome of The Crown Estate's plan-level HRA. The Crown Estate has now concluded that it cannot rule out an adverse effect on site integrity in relation to the kittiwake feature of the Flamborough and Filey Coast SPA and the sandbank feature of the Dogger Bank SAC.

8.3.2. Given the strategic nature of plan-level HRA, there are inherent uncertainties within the AA conclusions; in particular, projects will undergo significant further refinement as part of the consenting process, following detailed site specific environmental and technical survey works and detailed engineering and design. It is therefore not possible to specify the precise nature (for both European Sites) and location (for kittiwake alone) of compensatory measures that might be required but the nature of the adverse effects, and the conservation objectives which might be undermined, can reasonably be anticipated at this time and the associated risks to the coherence of the network can be meaningfully be explored. To give confidence that compensatory measures will fully compensate for the negative effects of the Round 4 Plan on the affected European Sites, The Crown Estate considers that the Plan must provide a robust framework that sets out the broad parameters and mechanisms for the delivery of compensatory measures, on the assumption that they will be required following the more detailed project level assessments noted above.

Dogger Bank SAC

8.3.3. The predicted effect of the Round 4 Plan on the Dogger Bank SAC is a both loss and habitat damage of sandbank habitat, undermining the Conservation Objectives of the site due to a reduction in extent of the designated feature. As the spatial extent of the habitat within the network is reduced the objective of compensatory measures identified is to ensure the ability of the National Site Network to restore sandbank to a favourable conservation status is not compromised.

8.3.4. The Crown Estate are aware of a wide variety of compensatory measures as set out in relevant guidance (European Commission 2019). The review undertaken by NIRAS identified a range of potential compensatory measures. The Crown Estate agrees with the conclusion of NIRAS that compensatory measures are available to compensate for the adverse effect identified on the sandbank feature of Dogger Bank SAC, but also considers that it may be possible to extend the existing site. The following measures are considered to be potentially available to appropriately compensate for the identified impact, whilst it is acknowledged that measures considered in relevant guidance (European Commission 2019) may be evidenced to be suitable when project specific information is available:

- Removal of Structures
- Removal of Debris
- Enhancement of existing habitat
- Reduction of other pressures from other activities (e.g. reserve creation and associated restrictions)
- New site designation (including extension of the existing site)

Review of potential compensation measures

8.3.5. Consideration of the measures, based on the review undertaken by NIRAS, is provided below. Some measures could be delivered independently by the project proposer whilst other measures would require a coordinated approach with Government and the exercise of statutory powers.

8.3.6. In addition, any relevant new or novel compensatory measures that may come to light will also be considered.

Removal of structures

8.3.7. The Crown Estate has considered the potential for removal of disused structures within the Dogger Bank SAC. Removal of disused structures directly addresses an issue, the presence of structures such as matting and pipelines from oil and gas industries, which JNCC (2018) note as adversely affecting feature condition. The measure could be delivered within the same location as the Preferred Projects in the Dogger Bank SAC;

it could potentially also be delivered on sandbank habitats at another UK European Site. In the context of DEFRA (2021) guidance this measure is therefore ranked '1' (address same impact at same location).

8.3.8. There is sufficient evidence of structures and their potential for removal within Dogger Bank SAC. NIRAS estimated:

- 0.77km² of the seabed could be impacted by the physical presence of existing disused pipelines,
- 30.2km of rock placed along the existing pipelines within the SAC,
- 0.3km² of seabed could be impacted by existing rock along pipelines within the SAC, and
- removal of disused telecommunication cables would represent an area of 0.018km².

8.3.9. NIRAS noted however that the area of habitat damage, associated with the Round 4 plan, could not be offset in a like-for-like manner, and this may require a wider approach seeking to secure benefits both within and outside the European Site. Removal at another SAC will help to ensure the overall coherence of the National Site Network in the context of Annex 1 habitats. Time required for implementation was estimated by NIRAS to be a period of 1-3 years. As noted by NIRAS however recovery of habitats would take place quickly in areas of active sediment movement but the timescale for full recovery is uncertain and could take many years; NIRAS outline that a pragmatic view may be required to accept that recovery is ongoing but contributing to the network and that 3- 6 years may be required before the commencement of any Projects within the Dogger Bank SAC. The Crown Estate consider there is adequate time before the likely commencement of projects for this measure to be implemented and for recovery to occur.

8.3.10. Consultation was undertaken with the EWG on the technical compensation note drafted by NIRAS. The Wildlife Trusts raised concerns that following the polluter pays principle and due to licence conditions, infrastructure decommissioning should be undertaken by the oil and gas industry. Natural England highlighted that there was thoughtful analysis around this measure but, as a result, highlighted significant issues with the achievement of compensatory measures of a like scale. Additionally, that removal of structures on other Annex I sandbanks is a potential option but further discussion is required to ensure that this is a viable option for maintaining the coherence of the MPA network. The Crown Estate has considered these comments and agrees within the Dogger Bank SAC the scale of compensation required would not be met by removal of structures alone, consideration may need to be given to other Annex I sandbanks within the MPA network. As such this measure will be taken forward as part of a suite of other measures that could potentially be used in combination to achieve the desired scale of compensation at Dogger Bank SAC before considering whether additional compensation is required at other sites.

8.3.11. JNCC highlighted that rock placement (associated with oil and gas installations) is considered to be a permanent impact and that rock armour removal has never been achieved even though it is considered within decommissioning programmes. JNCC raised concerns that permanent environmental damage could be caused by the removal of rock placement. The Crown Estate has considered these comments and notes further discussion is required with SNCBs on implications of removal of rock protection. Additionally it is worth noting removal of structures is not limited to one sector or one type of removal – NIRAS outline disused pipelines and cables which may be targeted in addition to rock protection. As such this measure will be taken forward as part of a suite of other measures that could potentially be used to achieve the desired scale of compensation for Dogger Bank SAC.

8.3.12. This compensation measure could be undertaken by a project proposer provided all necessary consents are in place.

Removal of debris

- 8.3.13. The Crown Estate has considered the potential for removal of debris within the Dogger Bank SAC. The measure is similar to the removal of structures in that it directly addresses an issue which has potential to adversely affect the condition of the European Site. The measure could be delivered within the same location as the Preferred Projects in the Dogger Bank SAC; it could potentially also be delivered on sandbank habitats at another UK European Site. In the context of DEFRA (2021) guidance there is preference for this measure to be implemented within the European Site and is therefore ranked '1', however it could also be implemented on the same feature outside of the European Site (ranked '2').
- 8.3.14. NIRAS noted a key uncertainty in the amount of material present for removal and the appropriate level of compensation for physical habitat damage, complicated further by the expected recovery, over time, of areas of damage which also affects consideration of gain quantification for both habitat loss and damage (the timescale for full recovery is uncertain and this is important when determining the point at which the gain can be measured). Removal at another SAC will help to ensure the overall coherence of the National Site Network in the context of Annex 1 habitats. Time required for implementation was estimated by NIRAS to be a period of 3-4 years before commencement of construction of any Preferred Project in the SAC under the Round 4 Plan.
- 8.3.15. Consultation was undertaken with the EWG on the technical compensation note drafted by NIRAS. Defra raised the suitability of the measure and where SNCBs identify this as a known pressure on features and in line with Defra's policy on marine litter removal. The Wildlife Trusts outlined no endorsement for this measure and a complete lack of support for this measure across numerous stakeholders adding that further site decline would be expected if these measures were implemented - which would mean the coherence of the UK Sites Network would not be met. JNCC outlined debris removal would not deliver at one-to-one ratio in relation to habitat loss it is not considered critical in determining the achievement of the conservation objectives for the site. Natural England added that whether there would be sufficient material across multiple MPAs and consider that litter/debris is likely to be very sparse. Natural England also noted that the presence of marine debris has never been raised as hindering the conservation objectives for the site, noting that if debris removal is intended as a one-off removal it is extremely unlikely to compensate for lasting impacts over the lifetime of the projects.
- 8.3.16. The Crown Estate has considered these comments and reviewed the Advice on Operations for Dogger Bank SAC, within the supporting information litter is identified as a potential pressure from a number of offshore activities, however it is acknowledged that there is a lack of certainty over the amount of debris present on the site. The Crown Estate considered it would be premature to remove this as a potential compensation option at this time without further consideration and investigation, but acknowledges the challenges identified by Natural England, JNCC and The Wildlife Trusts. Additionally The Crown Estate agrees that within the Dogger Bank SAC the scale of compensation required would likely not be met by removal of debris alone. It is also noted that at this time this measure has been adopted at a project level but there are concerns that the measure may not be viable by the time the Preferred Projects of Round 4 come to implement compensation. As such, this measure will remain part of a suite of other measures that could potentially be used alongside other compensatory measures to achieve the desired scale of compensation for Dogger Bank SAC.
- 8.3.17. This compensation measure could be undertaken by a project proposer provided all necessary consents are in place.

Enhancement of existing habitat

- 8.3.18. The Crown Estate has considered the potential for the enhancement of existing habitats within the Dogger Bank SAC or at other sites within the network designated for the same feature. The measure could be delivered within the same location as the Preferred Projects in the Dogger Bank SAC; it could potentially also be delivered on sandbank habitats at another UK European Site. In the context of DEFRA (2021) guidance this measure is therefore ranked '1' (address same impact at same location), however it could also be implemented on the same feature outside of the European Site ranked (ranked '2').
- 8.3.19. With regards to sandbank restoration at the Dogger Bank SAC or restoring another (degraded) sandbank, given the unique nature of the site (shallow sandy mound feature, produced by glacial processes) any new sandbank feature would have to be recognised as not equivalent in terms of its provenance, but that it could potentially deliver benefits to the National Site Network as the Annex 1 feature 'sandbanks slightly covered by seawater all the time'. There are substantial uncertainties regarding the ability to create a sustainable sandbank feature at another location and as such is excluded as a possible compensation option. However, restoration of one or more other degraded sandbanks may be a more successful option. Whilst noting that substantial work would be required to evidence likely deliverability from a practical perspective it is considered premature to exclude sandbank restoration at the Dogger Bank SAC or elsewhere in the network.
- 8.3.20. NIRAS noted that there is evidence that a true (pre-industrial fishing) baseline would be more structurally diverse with ubiquitous 'encrusting' invertebrates (Plumeridge & Roberts, 2017), and has identified reef enhancement measures including biodiversity enhancement through introduction of stony reef or seeding of biogenic reef as potential compensation. Additionally, RWE (2021) identified that historically a large area of native oyster (*Ostrea edulis*) was present to the immediate south of Dogger Bank and therefore could provide a natural biogenic feature, and suitable habitat for planting may exist to the south of the Dogger Bank SAC. This measure would not address current conservation objectives, but it is noted here as potentially relevant if a case for restoration towards a more natural baseline were to be made by SNCBs. Whilst noting that substantial engagement and technical work would be required to understand the practicalities of this option, due to its deliverability and the timescales associated with the Round 4 plan allowing for further exploration of this option it is considered premature to exclude sandbank restoration at the Dogger Bank SAC or elsewhere in the network.
- 8.3.21. Consultation was undertaken with the EWG on the technical compensation note drafted by NIRAS. Natural England outlined agreement with NIRAS' conclusions but outlined that further consideration of this measure may be worthwhile and the opportunity to collate the evidence for seabed recovery to better understand the likely scale and speed. NIRAS noted that these measures would potentially result in wider biodiversity gains and if measured against a pre-industrial baseline as opposed to the conditions resulting from historic fishing and other industrial pressures, or where the recovery of other habitats in the UK are supported.
- 8.3.22. This compensation measure could be undertaken by a project proposer provided all necessary consents are in place.

Reduction of other pressures

- 8.3.23. The Crown Estate has considered the potential for reduction of pressures from other activities within the Dogger Bank SAC or at other sites within the network designated for same feature. Reduction of pressure from fishing activity would represent a direct benefit for sandbank habitat by reducing/removing a pressure

currently acting on the designated feature at the European Site. Other than reduction or removal of pressure from demersal fishing it is concluded that there is currently no realistic opportunity of working with other marine industries, or regulators, to change the scale of an existing impact at the Dogger Bank SAC. In the context of DEFRA (2021) guidance there is preference for this measure to be implemented within the European Site and is therefore ranked '1', however it could also be implemented on the same feature outside of the European Site ranked (ranked '2').

8.3.24. NIRAS noted that the Marine Management Organisation ("MMO") have made a byelaw which comes into force in June 2022, prohibiting all bottom towed fishing throughout the SAC (MMO, 2021). There is, however, the potential to add to the spatial extent, longevity or effectiveness of the fishing prohibition which represents additional benefit. Time required for implementation was estimated by NIRAS to be a period of 2-3 years before commencement of construction of any Preferred Project in the SAC under the Round 4 Plan.

8.3.25. Consultation was undertaken with the EWG on the technical compensation note drafted by NIRAS. MMO raised that reducing demersal fishing in the Dogger Bank SAC had already been proposed and as such would mean that reducing pressure from demersal fishing would not be considered additional to normal practice. JNCC outlined that given the current MMO consultation on the byelaw for bottom towed fishing within Dogger Bank SAC that removing fisheries pressure within the site or any other MPA would not be considered compensation. Natural England outlined support in principle for this measure and outlined that the reduction of fishing pressure is a compensatory measure with significant potential, noting additional work which The Crown Estate could commission to review the range and scale of fishing activity to understand the potential contribution additional management measures might make. The Wildlife Trusts also highlighted this measure as one of the most powerful compensation measures adding that The Wildlife Trusts are open to discuss how The Crown Estate could provide additionality in this management measure.

8.3.26. The Crown Estate has considered these comments and note that the measure is included as a method to assist in the successful implementation longevity, extent and/or effectiveness of any fishing prohibition, with the potential to demonstrate additional benefit over the current prohibition. It would be premature to remove this as a potential compensation option at this time especially given that additional benefit, through longevity and effectiveness, from the implementation of the byelaw is unknown. As such this measure will be taken forward as part of a suite of other measures that could potentially be used alongside other compensatory measures to achieve the desired scale of compensation for the Dogger Bank SAC.

8.3.27. This compensation measure could not be delivered by a project proposer but would require the exercise of statutory powers by Government or the marine regulator.

Uncertainty

8.3.28. A remaining uncertainty at the Dogger Bank SAC is also the potential impact/benefit of the proposed restriction of bottom towed fishing by byelaw, which was consulted upon by the MMO in February 2021, and the reduction of pressure and potential recovery of the Annex I sandbank habitat and the implications for a change in conservation status of the European Site.

New site designation (including extension of the existing site)

8.3.29. The Crown Estate has considered the potential for new site designation and extension of the existing site. New compensatory areas would likely be current-tidal sandbanks which would meet the same criteria in terms of Annex I habitat definition in relation to structure and function but would not be ecologically identical to the habitat lost. In the context of DEFRA (2021) guidance there is preference for this measure to

be implemented within the European Site (extension of existing site) and is therefore ranked '1', however it could also be implemented on the same feature outside of the European Site (new site designation) and ranked '2'. NIRAS concluded that the timing for implementation is uncertain but it would need to be accomplished within 5-8 years to contribute to the network before the start of construction of projects within the Dogger Bank SAC.

- 8.3.30. Preferred Bidder 1 and 2 supplied a report on potential compensation options: extension of existing site and habitat creation (RWE, 2021). This report will be made publicly available upon completion of the HRA process.
- 8.3.31. The document considered further the potential for an extension of the Dogger Bank SAC, outlining the decision-making process around the current SAC boundary, first recommended to Defra as a draft SAC in 2005, which was delineated in 2010 by examining aspects of the geology, biology and topography of the sandbank and "closely follows the extent of the Annex I sandbank habitat" (JNCC, 2011a). The report noted that Annex I sandbank habitat generally occurs in shallow waters (less than 20m water depth) the habitat extent is not defined by water depth (European Commission 2007, RWE 2021). As part of the decision-making process, the 2010 SAC boundary was delineated following peer-reviewed re-analysis of available data on benthos and epibenthos to identify the characteristic biological communities of the shallower parts of the bank (those in less than 20m water depth) and their extent into deeper waters (RWE, 2021). However, the report noted that the biological communities characteristic of the shallower parts of the bank extended out to approximately 35-40m water depth.
- 8.3.32. As highlighted above, JNCC had first recommended the Dogger Bank to Defra as a draft SAC in 2005, but in 2008, JNCC conducted informal dialogue meetings with UK Government departments and stakeholder groups and received informal feedback on the 2008 draft SAC proposal (the site boundary (Figure 4 and Figure 5) which included sandy sediments down to 50m water depth) (JNCC 2011b, RWE 2021). The report indicates that in response to concerns raised, JNCC conducted the above mentioned independent peer review and re-examined scientific justification for the draft SAC. Ultimately this resulted in a site recommendation to Government (with a reduced site boundary) which did not change the features for which the site was identified but resulted in the smaller 2010 site boundary as shown in Figure 3 (JNCC 2011a) nor have either subsequently changed (RWE, 2021).
- 8.3.33. Consultation was undertaken with the EWG on the technical compensation note drafted by NIRAS. The Wildlife Trusts and JNCC outlined their lack of support for designation of a new site as compensation primarily noting that Dogger Bank SAC is a unique glacial sandbank system and there are no other glacial sandbank which can be designated to account for the impact on this site. Whilst The Crown Estate consider the uniqueness of the glacial sandbank as notable, it should be noted that the glacial sandbanks are not Annex 1 qualifying habitats. The Wildlife Trusts added a lack of support for the extension of the European Site due to the potential for chipping away and deterioration of existing sites as well as creating further problems in the future for offshore wind farm development, complicating the consenting process and further risking the ecological integrity of the UK MPA network. The Crown Estate has considered these comments and notes the lack of support for a new designation that is not ecologically identical but meets the same Annex 1 qualifying criteria, given the uniqueness of the Dogger Bank SAC. However further extension of Dogger Bank SAC would improve the coherence of the site as areas to the north of the current boundary are structurally and functionally similar to adjacent communities.

8.3.34. The MMO noted that new site designation or extension of existing sites are not promoted by Defra but noted that the sites are intended to form part of the national network and therefore must be protected to the same standard as a candidate, proposed and designated European Site. Natural England outlined that site extension would be a less time consuming than identifying a new site and the benefits of existing site management measures that could be extended quickly following designation. The Crown Estate has considered these comments and agrees The Dogger Bank SAC has clear areas of potential for extension where the Annex 1 Sandbank extends beyond the existing site boundary. As identified by Natural England an advantage of this and promoting an extension to the Dogger Bank SAC over identifying a new site for designation elsewhere, is that this would occur well within the timeframe that would be required for site selection of a new SAC. As such this measure will be taken forward as part of a suite of other measures that could potentially be potentially be used alongside other compensatory measures to achieve the desired scale of compensation at Dogger Bank SAC.

8.3.35. This compensation measure could not be delivered by a project proposer but would require the exercise of statutory powers by Government.

Summary

8.3.36. The Crown Estate has considered the measures available at the Dogger Bank SAC and is content that there is enough information available at this stage to demonstrate that the above options have the potential to meet the key criteria outlined in DEFRA guidance (2021), either on their own or used as part of a wider suite of measures.

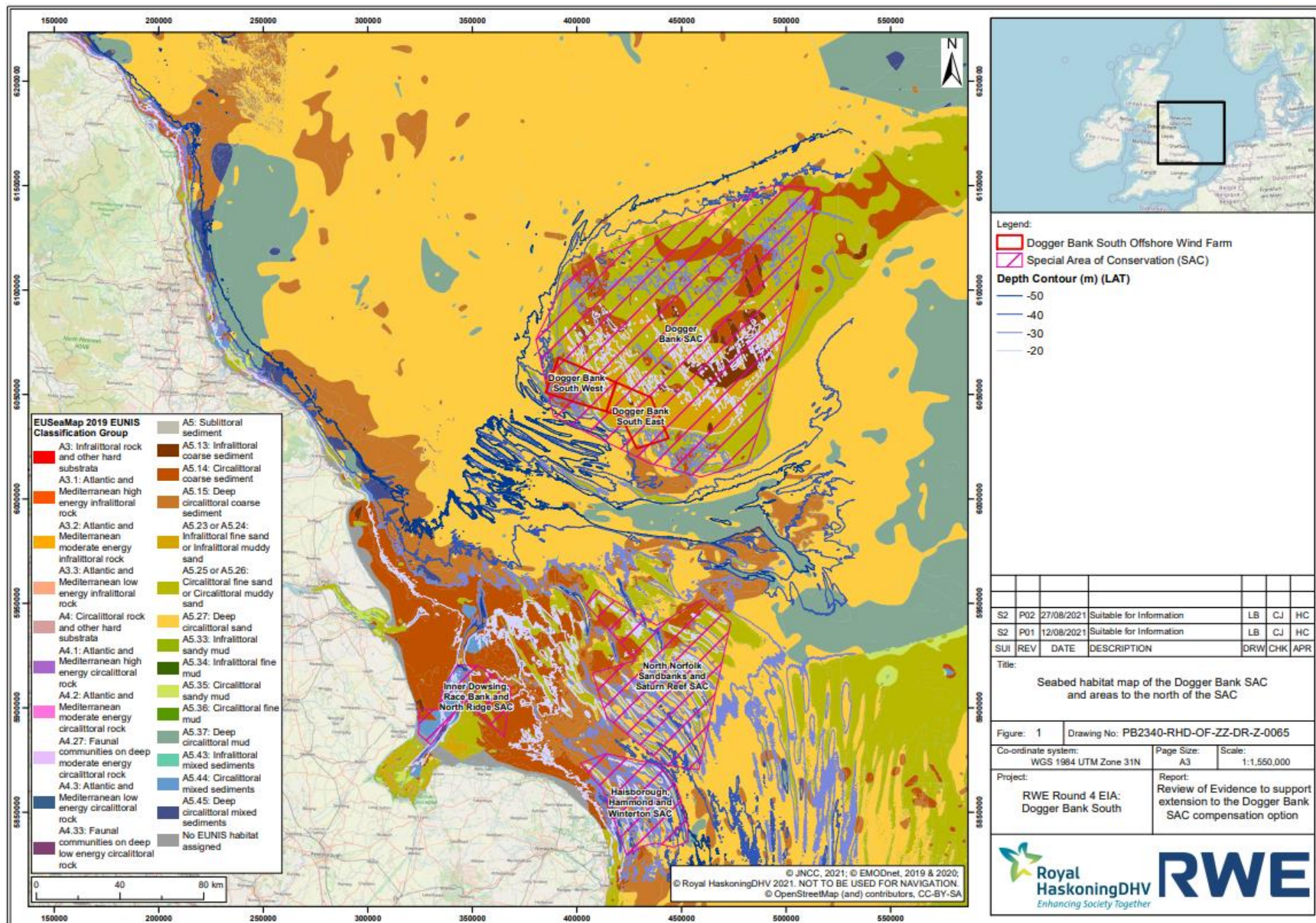


Figure 3. Seabed habitat map of the Dogger Bank SAC and areas to the north of the SAC (RWE, 2021)

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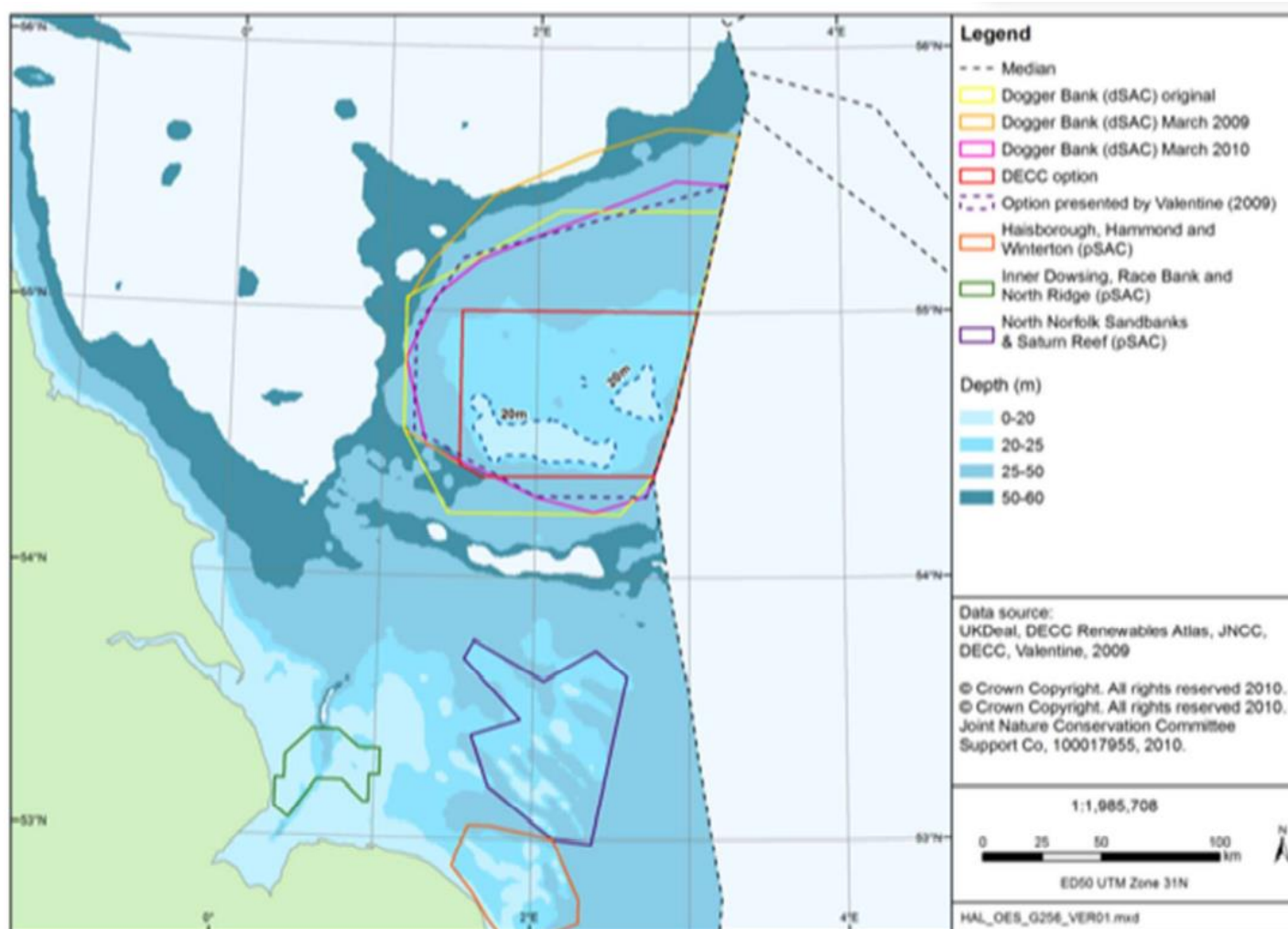


Figure 4 Proposed boundaries for Dogger Bank draft SAC (RWE, 2021)

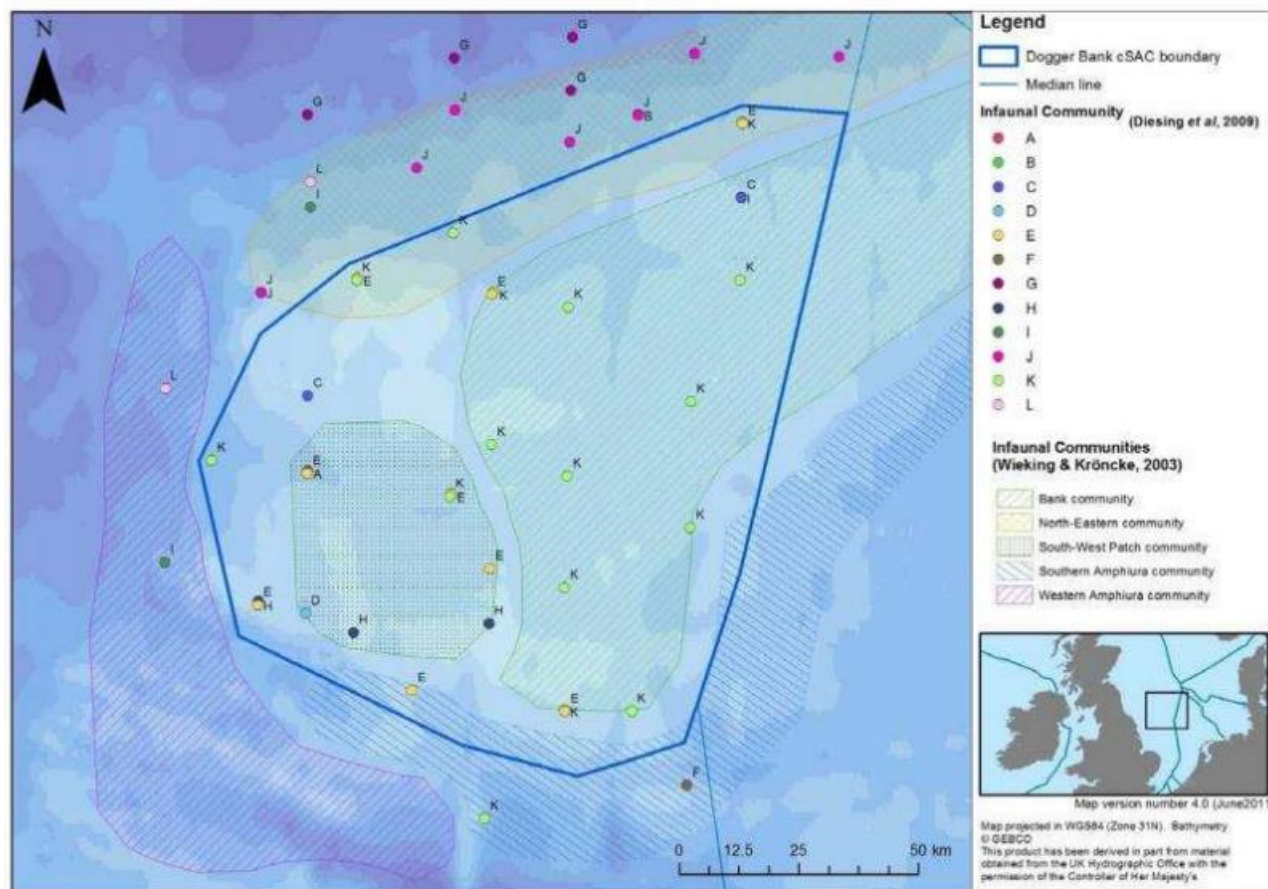


Figure 5. Infaunal communities of the Dogger Bank SAC (source: Figure 4a of JNCC 2011b, RWE 2021)

Flamborough and Filey Coast SPA

8.3.37. The predicted effect of the Round 4 Plan on the kittiwake feature of the Flamborough and Filey Coast SPA is associated with collision mortality in combination with other plans and projects, undermining the conservation objective to restore or maintain the kittiwake population as a qualifying feature of the site. As loss of kittiwake is contrary to the conservation objective of the site the objective of compensatory measures is to ensure that the ability of the National Site Network to maintain or restore the population of kittiwake is not compromised.

8.3.38. The Crown Estate are aware of a wide variety of compensatory measures as set out in relevant guidance (European Commission 2019). The review undertaken by NIRAS identified a range of potential compensatory measures, The Crown Estate agrees with the conclusion of NIRAS that potential compensatory measures are available to compensate for the adverse effect identified on the kittiwake feature of Flamborough and Filey Coast SPA. The following measures are considered to be potentially available to appropriately compensate for the identified impact, whilst it is acknowledged that measures considered in relevant guidance (European Commission 2019) may be evidenced to be suitable when project specific information is available:

- Onshore artificial nesting structures
- Offshore artificial nesting structures
- Limitations and/or restrictions to southern North Sea sand eel fishery
- Other enhancement measures to increase prey availability

Review of potential compensation measures

8.3.39. Consideration of the measures, based on the review undertaken by NIRAS, is provided below.

8.3.40. In addition, any relevant new or novel compensatory measures that may come to light will also be considered.

Onshore artificial nesting structures

8.3.41. The Crown Estate has considered the potential for onshore artificial nesting structure for kittiwake from the Flamborough and Filey Coast SPA. Successful breeding at artificial nesting structures can contribute kittiwake to the Flamborough and Filey Coast SPA population to offset collision mortalities and has the potential to be considered a like for like compensation. The measure would be located outside of the European Site due to competition for food with the resident kittiwake population reducing the likelihood of breeding success (Vattenfall, 2021).

8.3.42. Breeding success of kittiwakes on artificial structures can be just as high as at more natural sites in the UK, and NIRAS noted the location of artificial nesting structures is key in determining successful colonisation and breeding; they also noted that there is uncertainty around the extent of kittiwake nesting on existing offshore platforms and the design features that promote or deter their colonisation - such considerations could constrain the number of suitable locations, especially with increasing build out of wind farms further offshore. Examples of successful kittiwake colonies on artificial coastal structures include: Sizewell nuclear power station (outfall structures), Tyneside and Gateshead (buildings and bridges) as well as bespoke kittiwake towers, Lowestoft harbour wall structure and town centre buildings, and finally Dunbar Castle and harbour walls. However mortality was noted for breeding kittiwake along the breeding wall at Lowestoft (Furness et al., 2013) when a fox accessed the breeding ledge. In regards to recruitment, Vattenfall (2020)

noted that a small area of wall, measuring 30m by 8m could accommodate 200 pairs. A colony of this size could produce around 5 times as many adult recruits as the mortalities to be lost.

8.3.43. Time required for implementation of this measure was estimated by NIRAS to be a period of 5-8 years.

8.3.44. Consultation was undertaken with the EWG on the technical compensation note drafted by NIRAS. RSPB raised that artificial nesting structures are not a 'proven' solution as a compensatory measure, outlining the remaining uncertainty of efficacy and oversupply of structures (due to Round 3). RSPB added that meta-population analysis should be carried out by The Crown Estate to understand the feasibility of the establishment of colonies. The Wildlife Trusts outlined that it does not support this measure as a compensation measure as it is not a long-term sustainable option with little evidence to support the effectiveness of the structures. Natural England highlighted that the measure has support in the short term but may not be ecologically meaningful in the medium to long term. The Crown Estate consider that it would be inappropriate to remove this as a possible compensatory measure at this time but should remain in consideration as part of a possible suite of measures. As part of The Crown Estates proposed 'managed implementation' approach to mitigation and compensation the appropriateness of this measure will be explored further should projects enter into an agreement for lease.

8.3.45. The Crown Estate has considered these comments and note that there is a lack of certainty over the efficacy of these structures and the potential for suitable sites to be 'used up' as well as the suggestion of meta-population analysis and how this could be useful in a strategic approach. This will be taken forward and considered during The Crown Estate's managed implementation approach to compensation. The Crown Estate notes that there are short term benefits to the introduction of these platforms which means it is premature to remove this as a potential compensation option at this time. As such this measure will be taken forward as part of a suite of other measures that could potentially be used alone or in combination to achieve the desired scale of compensation at Flamborough and Filey Coast SPA.

8.3.46. This compensation measure could be undertaken by a project proposer provided all necessary consents are in place.

Offshore artificial nesting structures

8.3.47. The Crown Estate has considered the potential for offshore artificial nesting structure for kittiwake from the Flamborough and Filey Coast SPA. As with onshore artificial nesting structures, successful breeding can contribute kittiwake to the Flamborough and Filey Coast SPA population to offset collision mortalities and has the potential to be considered a like for like compensation. Additionally, kittiwake are known to breed on offshore structures such as oil and gas platforms (Vattenfall 2021), and those colonised in the southern North Sea form part of the southern North Sea metapopulation.

8.3.48. Breeding success of kittiwakes on artificial structures can be just as high as at more natural sites in the UK, and NIRAS noted the location of artificial nesting structures is key in determining successful colonisation and breeding and that there is uncertainty around the extent of kittiwake nesting on existing offshore platforms and the design features that promote or deter their colonisation - such considerations could constrain the number of suitable locations, especially with increasing build out of wind farms further offshore. Time required for implementation was estimated by NIRAS to be a period of 5-8 years.

8.3.49. Consultation was undertaken with the EWG on the technical compensation note drafted by NIRAS. The Wildlife Trusts outlined that seabirds can be found nesting on existing infrastructure, but there are a number

of concerns regarding the use of existing and new infrastructure especially if within an MPA. The Wildlife Trusts added that there has been a lack of consideration of this measure in relation to other ambitions for UK seas (e.g. location of existing and future activities alongside a recovered marine environment) and the lack of sustainability for sea space and kittiwake populations. The Wildlife Trusts concluded that is not supportive of offshore nesting platforms as a principle across all offshore wind farm developments. RSPB raised that artificial nesting structures are not a 'proven' solution as a compensatory measure, outlining the remaining uncertainty of efficacy and oversupply of structures (due to Round 3). RSPB added that meta-population analysis should be carried out by The Crown Estate to understand the feasibility of the establishment of colonies. Natural England highlighted that a key area of uncertainty is the difficulty in proving additionality in relation to artificial structures. JNCC outlined the remaining uncertainty on the optimum design of offshore structures and their rate of success (whether new or modification of existing platforms).

8.3.50. The Crown Estate has considered these comments and note that there is a lack of certainty over the efficacy of these structures, siting of the structures and proving additionality as well as the suggestion of meta-population analysis and how this could be useful in a strategic approach. This will be taken forward and considered during The Crown Estate's managed implementation approach to compensation. The Crown Estate notes that there are short term benefits to the introduction of these platforms which means it is premature to remove this as a potential compensation option at this time. As such this measure will be taken forward as part of a suite of other measures that could potentially be used alone or in combination to achieve the desired scale of compensation at Flamborough and Filey Coast SPA.

8.3.51. This compensation measure could be undertaken by a project proposer provided all necessary consents are in place.

Reduced southern North Sea sand eel fishery

8.3.52. The Crown Estate has considered the potential for a reduction in southern North Sea sand eel fishery for kittiwake from the Flamborough and Filey Coast SPA. Reducing the sand eel fishery pressure in waters where kittiwake forage would allow sand eel stocks to recover, increasing prey availability for kittiwake which could improve regional colony productivity. Reducing sand eel fishery pressure therefore offers a strategic opportunity to compensate for the cumulative/in-combination impact of offshore wind farms on the southern North Sea kittiwake population.

8.3.53. NIRAS noted that the effectiveness of local sand eel fishery closure for kittiwake has been demonstrated off the east coast of Scotland and resulted in higher sand eel stock biomass (Greenstreet et al., 2006) and an increase in kittiwake breeding success at colonies within the closed area compared to those outside (Daunt et al., 2008, Frederiksen et al. 2008). Carroll et al. (2017) suggested that a 50% reduction in fishing mortality on the southern North Sea sand eel stock would increase local kittiwake productivity by an average of 0.2 chicks per nest. Vatenfall (2020) noted that restrictions on sandeel fishing in the North Sea would result in nearly 10,000 adults per year surviving to recruit into colonies at 4 years of age. Time required for implementation was estimated by NIRAS to be a period of 5 years.

8.3.54. Consultation was undertaken with the EWG on the technical compensation note drafted by NIRAS. The Wildlife Trusts and Natural England outlined support the delivery of a reduced sand eel fishery as a compensation measure. Natural England added that the measure offers a strategic opportunity to compensate for the cumulative/in-combination impact and advised that consideration would be needed of reducing the overall take of sandeels, not just spatial management measures. RSPB outlined the first requirement to reduce

the sandeel fishery to benefit the European Site would be as an SPA site management measure. RSPB added that it would be necessary to demonstrate additionality over and above the ability to restore the population to above 83,700 pairs (the designation level). JNCC noted uncertainty in the feasibility of reducing fishing pressure in the locations required as this would be out of the hands of any project developer(s).

8.3.55. The Crown Estate has considered these comments and note the support for this measure and the remaining uncertainty around additionality and delivery of the measure by developers. The Crown Estate notes that NIRAS recommended - to increase confidence in the delivery of compensatory measures - a managed implementation approach to compensation. As such this measure will be taken forward as part of a suite of other measures that could potentially be used alongside other compensatory measures to achieve the desired scale of compensation at Flamborough and Filey Coast SPA.

8.3.56. This compensation measure could not be delivered by a project proposer but would require the exercise of statutory powers by Government or the marine regulator, and engagement with the regulator will be required to determine whether this measure can be taken forward in practice, but it is not considered that it should be ruled out as a potential measure at this time.

Other enhancement measures to increase prey availability

8.3.57. The Crown Estate has considered the potential to identify measures that would increase prey availability for kittiwake from the Flamborough and Filey Coast SPA. These measures would be in addition to the reduction of the North Sea sand eel fishery as described in paragraphs 8.3.44 to 8.3.48. Examples of these measures may include creation of habitat with ecosystem services (such as sea grass restoration to increase small forage fish), or new site designation to allow increased management of fisheries for prey species.

8.3.58. NIRAS noted that there is a lack of real word examples to evidence the effectiveness of a measure and there would be significant difficulties demonstrating the effectiveness of these measures.

8.3.59. Consultation was undertaken with the EWG on the technical compensation note drafted by NIRAS. The Wildlife Trusts indicated that they consider reef creation or enhancement not to be a viable option. Natural England recommended that further consideration of this option may be worthwhile, in particular there could be work undertaken to collate the evidence for seabed recovery to better understand the likely scale and speed of habitat creation or enhancement, but agreed with the conclusion in principle that it is unlikely to be a realistic compensatory option. The JNCC acknowledged that various habitats have been present in the North Sea throughout its history, but identified difficulties in understanding what habitats may be appropriate to create or enhance. The MMO agreed that nature based solutions such as reef or seagrass creation or restoration could be used as part of a suite of compensatory measures.

8.3.60. The Crown Estate are aware of a range of compensatory measures which could enhance prey availability, however, The Crown Estate acknowledge the significant uncertainty around this option at the present time and further work would be required prior to determining the appropriateness of any measure that may be considered to deliver this compensation. Given the potential range of potential measures and timescales associated with delivery of compensation measures The Crown Estate consider that it would be premature to remove this as a potential compensation option at this time.

8.3.61. Some of the measures could be delivered by a project proposer, whilst some measures could not be delivered by a project proposer but would require the exercise of statutory powers by Government or the marine regulator.

Summary

8.3.62. The Crown Estate has considered the measures available for the Flamborough and Filey Coast SPA and is content that there is enough information available at this stage to demonstrate that the above options have the potential to meet the key criteria outlined in DEFRA guidance (2021), either on their own or used in combination with other measures.

Proposed approach to delivery of compensation

8.3.63. As highlighted in the previous sections, The Crown Estate is content that there are multiple measures available which are appropriate to deliver compensation for adverse effects on both Annex 1 sandbank at Dogger Bank SAC and kittiwake at the Flamborough and Filey Coast SPA prior to the construction of Round 4 Preferred Projects.

8.3.64. The review undertaken by NIRAS indicated that at the plan-level stage it is not possible to rule out the possibility that further evidence and information may come to light prior to construction which would render the compensatory measures identified in this HRA inappropriate or conversely require compensatory measures to be increased. NIRAS noted projects could be amended or abandoned and that adequate time will need to be allocated to consult appropriately with relevant stakeholder organisations. The evolution of projects and the availability of project detail for appropriate consultation with stakeholders will occur over a timescale that extends beyond the plan level HRA process for the Round 4 Plan. NIRAS also concluded that the ability for The Crown Estate to make a definitive decision on compensation at the plan level is highly constrained.

8.3.65. NIRAS recommended that The Crown Estate defers definition and delivery of compensation to the project level allowing for flexibility to be retained; however, NIRAS also recommended that The Crown Estate seek to provide assurance for the delivery of any necessary compensatory measures using a managed implementation approach. The delivery of measures which secure the optimum ecological outcomes (and which best protect network coherence) is likely to require a strategic co-ordinated approach between project proposers and Government and the exercise of statutory powers. This approach will secure mechanisms that steer the direction of compensation as a requirement of the plan (see paragraph 8.3.66).

8.3.66. The Crown Estate agrees with NIRAS in relation to the difficulty in agreeing delivery of compensation at the plan level without the complete, precise and definitive findings that are typically associated with project level HRAs. However, it is clear that strategic solutions are now required to allow the delivery of appropriate compensatory measures.

8.3.67. The identification and delivery of compensatory measures at a strategic level has wide support amongst SNCBs and environmental NGOs, and has been advocated to be the most appropriate approach to derogations to address the in-combination effects of multiple windfarms (Machin, 2020).

8.3.68. The Crown Estate will therefore establish a process for the delivery of compensatory measures on a strategic basis as a result of the Round 4 plan-level HRA.

- 8.3.69. The Crown Estate will develop a Dogger Bank Strategic Compensation Plan (“DBSCP”) which must be adhered to by Preferred Projects 1 and 2 and to which The Crown Estate will also commit. The development of the DBSCP will be overseen by a steering group established and chaired by The Crown Estate. Membership will include the Department for Business Energy & Industrial Strategy (“BEIS”), Department for Environment, Food & Rural Affairs (“Defra”), Natural England, the Joint Nature Conservation Committee (“JNCC”), Preferred Project 1 and Preferred Project 2. A terms of reference will be agreed with Steering Group members before it commences operation. The Steering Group will engage on the development of the DBSCP with The Crown Estate’s HRA Expert Working Group.
- 8.3.70. The overall objective of the Compensation Plan will be the development and delivery of strategic compensation to ensure the coherence of the UK Sites Network; the Plan and Steering Group will be in place as soon as practicable following the entering of projects into Agreement for Lease and no later than the end of 2022. The Compensation Plan will be required to include details of:
- Roles and responsibilities of involved parties
 - Scale and location of proposed strategic compensation
 - Consultation and engagement with stakeholders and relevant scientific experts
 - Delivery mechanism and funding agreements
 - Commercial agreements (if required)
 - Monitoring and adaptive management
 - Programme for proposed implementation and delivery
- 8.3.71. As identified above a key component of the DBSCP will be the monitoring and adaptive management measures. Adaptive management is an iterative process which will occur after preferred projects have entered into an Agreement for Lease and will combine management measures and monitoring with the aim of improving effectiveness of compensation measures whilst also providing up to date knowledge and improvements to decision making over time. The adaptive management of the DBSCP will be an important component of the compensation measure and will be used as a method to address unforeseen issues with compensation measures, deviations from expected time scales (i.e. recovery period of habitat following removal of structures).
- 8.3.72. The Crown Estate will develop a Kittiwake Strategic Compensation Plan (“KSCP”) which must be adhered to by Preferred Projects 1, 2 and 3 and to which The Crown Estate will also commit. The development of the KSCP will be overseen by a Steering Group established and chaired by The Crown Estate. Membership will include the Department for Business Energy & Industrial Strategy (“BEIS”), Department for Environment, Food & Rural Affairs (“Defra”), Natural England, the Joint Nature Conservation Committee (“JNCC”), Preferred Project 1, Preferred Project 2 and Preferred Project 3. A terms of reference will be agreed with Steering Group members before it commences operation. The Steering Group will engage on the development of the KSCP with The Crown Estate’s HRA Expert Working Group.
- 8.3.73. The overall objective of the Compensation Plan will be the development and delivery of strategic compensation to ensure the overall coherence of the UK Sites Network; the KSCP and Steering Group will be in place as soon as practicable following the entering of projects into Agreement for Lease and no later than the end of 2022. The Compensation Plan will require:
- Roles and responsibilities of involved parties
 - Scale and location of proposed strategic compensation
 - Consultation and engagement with stakeholders and relevant scientific experts

- Delivery mechanism and funding agreements
- Commercial agreements (if required)
- Monitoring and adaptive management
- Programme for proposed implementation and delivery

8.3.74. As identified above a key component of the KSCP will be the monitoring and adaptive management measures. Adaptive management is an iterative process which will occur after preferred projects have entered into an Agreement for Lease and will combine management measures and monitoring with the aim of improving effectiveness of compensation measures whilst also providing up to date knowledge and improvements to decision making over time. The adaptive management of the KSCP will be an important component of the compensation measure and will be used as a method to address unforeseen issues with compensation measures, deviations from expected time scales (i.e. colonisation rate of structure).

8.3.75. These requirements will be secured through Agreements for Lease.

8.4. Conclusion

8.4.1. Consideration has been provided above on the further tests set out in the Habitat Regulations for the demonstration of the absence of alternative solutions and IROPI as well as the identification of a range of possible measures which could compensate for adverse impacts as a result of the Round 4 Plan. The Crown Estate has demonstrated there are no alternative solutions that would be less damaging or avoid damage to the European Site and meet the objectives of Round 4, that there are IROPI to proceed and that the Round 4 plan provides a robust framework for the delivery of compensatory measures.

8.4.2. The Crown Estate also notes that during the consenting process as a matter of law each project will be required to undertake an impact assessment, including project level HRA, where a LSE on a European site cannot be excluded beyond reasonable scientific doubt. This assessment will take account of the detailed project design, informed by site-specific information, the distribution of the habitat features and their sensitivity to the proposed development. If necessary, project level assessment may also involve detailed site surveys and modelling work. This assessment will be used by the consenting body, as the competent authority, to undertake a statutory HRA, the outcome of which will ensure that the integrity of the European site(s) will be safeguarded because no project will be awarded consent where it is considered that it will lead to an AEOSI in respect of a European site save in the case of a derogation under Habitats Regulations.

8.4.3. The Crown Estate therefore considers the three tests have been met and as such the Round 4 plan can proceed to the next stage – notification of derogation to the Secretary of State and Welsh Ministers.

8.4.4. The Crown Estate will complete the 'Notice of a proposed habitats regulations assessment (HRA) derogation in England and Wales' to notify the relevant government department (Department for Business, Energy and Industrial Strategy), Welsh Government and the Department for Environment, Food and Rural Affairs, that the HRA for the Round 4 plan has been completed and intend to allow the plan with adverse effects on two European sites to go ahead under an HRA derogation. Following submission The Crown Estate will wait 21 days (unless advised otherwise) before adopting the plan.

9. References

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