Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects

Supplementary Environmental Report

Revision A
Non-material Change Application
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Glossary of Acronyms

AR	Avoidance Rates
BEIS	Department for Business, Energy and Industrial Strategy
CCC	Climate Change Committee
CRM	Collision Risk Model
CSCB	Cromer Shoal Chalk Beds
DCLG	Department for Communities and Local Government
DCO	Development Consent Order
DEL	Dudgeon Extension Limited
DEP	Dudgeon Offshore Wind Farm Extension Project
DEP-N	DEP North Array Area
DEP-S	DEP South Array Area
DESNZ	Department of Energy Security and Net Zero
DML	Deemed Marine Licence
EIA	Environmental Impact Assessment
EMF	Electro-Magnetic Field
ES	Environmental Statement
GBB	Great black-backed
GBS	Gravity-Base Structure
HAT	Highest Astronomical Tide
HRA	Habitats Regulations Assessment
HVAC	High Voltage Alternating Current
JNCC	Joint Nature Conservation Committee
km	Kilometre
LBB	Lesser black-backed
MCA	Maritime and Coastguard Agency
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
NRW	Natural Resource Wales
NDC	Nationally Determined Contributions
NMC	Non-Material Change

O&G	Oil and Gas
O&M	Operations and Maintenance
OSP(s)	Offshore Substation Platform(s)
RSA	Rotor Swept Area
RIAA	Report to Inform Appropriate Assessment
SAC	Special Area of Conservation
SEL	Scira Extension Limited
SEP	Sheringham Shoal Offshore Wind Farm Extension Project
SoS	Secretary of State
SSCs	Suspended Sediment Concentrations
TCE	The Crown Estate
TEC	Transmission Entry Capacity
UNFCCC	United Nations Framework Convention on Climate Change

Glossary of Terms

Air Gap	The distance between the lowest point of the rotating blade of the wind turbine and highest astronomical tide (HAT)
Dudgeon Offshore Wind Farm Extension Project (DEP)	The Dudgeon Offshore Wind Farm Extension onshore and offshore sites including all onshore and offshore infrastructure.
DEP North array area (DEP-N)	The wind farm site area of the DEP offshore site located to the north of the existing Dudgeon Offshore Wind Farm
DEP South array area (DEP-S)	The wind farm site area of the DEP offshore site located to the south of the existing Dudgeon Offshore Wind Farm
DEP wind farm site	The offshore area of DEP within which wind turbines, infield cables and offshore substation platform/s will be located and the adjacent Offshore Temporary Works Area. This is also the collective term for the DEP North and South array areas.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive. This includes candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation, potential Special Protection Areas, Special Protection Areas, Ramsar sites, proposed Ramsar sites and sites compensating for damage to a European site and is defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017, although some of the sites listed here are afforded equivalent policy protection under the National Planning Policy Framework (2021) (paragraph 176) and joint Defra/Welsh Government/Natural England/Natural Resource Wales (NRW) Guidance (February 2021).
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the Environmental Impact assessment (EIA) and Habitats Regulation Assessment (HRA) for certain topics.
Infield cables	Cables which link the wind turbine generators to the offshore substation platform(s).
Interlink cables	Cables linking two separate project areas. This can be cables linking: 1) DEP-S and DEP-N 2) DEP-S and Sheringham Shoal Offshore Wind Farm Extension Project (SEP) 3) DEP-N and SEP

	1 is relevant if DEP is constructed in isolation or first in a phased development. 2 and 3 are relevant where both SEP and DEP are built.
Interlink cable corridor	This is the area which will contain the interlink cables between offshore substation platform/s and the adjacent Offshore Temporary Works Area
Offshore export cables	The cables which would bring electricity from the offshore substation platform(s) (OSPs) to the landfall. 220 – 230kV
Non-Material Change Rotor Swept Area Band (NMC RSA Band)	Represents a wind turbine scenario which has fed into the updated offshore ornithology collision risk modelling undertaken to inform this non-material change application and which is secured in the draft Amendment Order
Total Rotor Swept Area (RSA)	The swept path taken up by all wind turbine rotors
Sheringham Shoal Offshore Wind Farm Extension Project (SEP)	The Sheringham Shoal Offshore Wind Farm Extension onshore and offshore sites including all onshore and offshore infrastructure.
SEP offshore site	Sheringham Shoal Offshore Wind Farm Extension consisting of the SEP wind farm site and offshore export cable corridor (up to mean high water springs).
SEP wind farm site	The offshore area of SEP within which wind turbines, infield cables and offshore substation platform/s will be located and the adjacent Offshore Temporary Works Area.

1 Introduction

1. Scira Extension Limited (SEL) and Dudgeon Extension Limited (DEL) submitted an application for development consent for the Sheringham Shoal Offshore Wind Farm Extension Project (SEP) and Dudgeon Offshore Wind Farm Extension Project (DEP) on 02 September 2022. On 17 April 2024 the Secretary of State (SoS) for the Department of Energy Security and Net Zero (DESNZ) granted the Sheringham Shoal and Dudgeon Extensions Offshore Wind Farm Order 2024[1] ('the Order') for the development of an offshore wind turbine generating station(s) with a gross electrical output capacity of more than 100 megawatts. The Order grants consent for SEP and DEP to be constructed, maintained and decommissioned under any of Scenarios 1(a), 1(b), 1(c), 1(d), 2, 3, or 4, as defined in the Order.

2. The SEP and DEP wind farm sites are located approximately 15.8 and 26.5 kilometres (km), respectively, from the North Norfolk coast. Offshore export cables transmitting power from the wind farm sites will make landfall at Weybourne in North Norfolk. From there, the onshore export cables will travel approximately 60km inland to a new high voltage alternating current (HVAC) onshore substation near to the existing Norwich Main substation.

1.1 Purpose of this Supplementary Environmental Report

3. This Supplementary Environmental Report has been prepared by Equinor New Energy Limited ('the Applicant') on behalf of SEL and DEL in support of an application for a non-material change (NMC) to the Order and an associated deemed marine licence (DML) variation application.

4. The upper limits of key offshore design parameters (for example, number of wind turbines, blade tip height, rotor diameter, Rotor Swept Area (RSA), length of interlink cables, interlink and infield cable protection areas and volumes) are secured within the Order. The NMC application proposes changes to the following parameters to facilitate an increase to the maximum generation capacity that is achievable by SEP and DEP:

   - Total RSA for SEP;
   - Total RSA for DEP;
   - Wind turbine Air Gap (i.e. the distance between the lowest point of the rotating blade of the wind turbine and highest astronomical tide (HAT));
   - The maximum number and length of interlink cables, the maximum number of interlink cable crossings and the maximum area and volume of interlink cable protection; and
   - The maximum number of infield cable crossings and maximum infield cable protection area and volume.

5. The increased Total RSA facilitates the increased generation capacity of the turbines. One additional interlink cable is needed to allow power to flow between

[1] The Sheringham Shoal and Dudgeon Extensions Offshore Wind Farm Order 2024, SI 2024/564.

SEP and DEP and between DEP-N and DEP-S at the increased generating capacity. The addition of this interlink cable means increasing the maximum number of cables by one as well as increasing the total interlink cable length parameter. The additional interlink cable makes four crossings of existing third-party infrastructure, which in turn means increased cable protection area and volume.

6. This document provides the details of the changes and an assessment of the potential environmental impacts resulting from the NMC.

7. This document has been prepared in accordance with The Infrastructure Planning (Changes to, and Revocation of, Development Consent Orders) Regulations 2011 (2011 Regulations) and follows the advice and guidance outlined in the Planning Act 2008: Guidance on Changes to Development Consent Orders (December 2015) (DCO Changes Guidance) from the Department for Communities and Local Government (DCLG).

8. This document reviews the receptor topic assessments within the SEP and DEP Environmental Statement (ES) and considers whether there will be any change to the conclusions in the context of proposed changes to the wind turbine and interlink and infield cable parameters. Furthermore, it also considers whether the proposed changes would alter the conclusions of the Habitats Regulations Assessment (HRA) and Stage 1 Cromer Shoal Chalk Beds (CSCB) MCZ Assessment underpinning the Order. Consideration of potential changes in effects on land rights and local people is also provided. The materiality and impacts of the changes proposed are considered in **Sections 3** to **6**.

9. A parallel application to the Marine Management Organisation (MMO) is also being made in accordance with the Marine and Coastal Access Act 2009 to vary the associated DMLs in accordance with the changes sought in the NMC application.

10. There is no statutory definition of what constitutes a material or non-material amendment for the purposes of Schedule 6 of the Planning Act 2008 and Part 1 of the 2011 Regulations; however, the government has issued guidance on this point. Paragraphs 9-16 of the DCO Changes Guidance set out the four characteristics which indicate whether a proposed change to a DCO should be treated as material or non-material. The following characteristics are stated to indicate that an amendment is more likely to be considered 'material':

- A change should be treated as material if it would require an updated ES (from that at the time the original DCO was made) to take account of new, or materially different, likely significant effects on the environment.
- A change is likely to be material if it would invoke a need for a Habitats Regulations Assessment. Similarly, the need for a new or additional licence in respect of European Protected Species is also likely to be indicative of a material change.
- A change should be treated as material that would authorise the compulsory acquisition of any land, or an interest in or rights over land that was not authorised through the existing DCO.

- The potential impact of the proposed changes on local people will also be a consideration in determining whether a change is material.

11. Consideration of each of these four points is provided in **Sections 3** to **6** below.

1.2 Justification for the Change

12. The Climate Change Act 2008 (2050 Target Amendment) Order 2019 amended the UK's carbon emission target, previously set at an 80% reduction, to a 100% reduction by 2050 relative to the 1990 baseline, legally committing the UK to reaching 'net zero' by 2050. In order to achieve net zero, an interim target of fully decarbonising the UK power system by 2035 has been set. Furthermore, the Climate Change Committee advice report (CCC, 2023a) regarding the UK's sixth Carbon Budget, proposes a target of 78% reduction on 1990 baseline by 2035.

13. In the Nationally Determined Contributions (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC), submitted in December 2020, the UK committed to reducing economy-wide greenhouse gas emissions by at least 68% by 2030, compared to 1990 levels (Department for Business, Energy and Industrial Strategy (BEIS), 2022).

14. Despite the UK having achieved and surpassed its first (2008-2012) and second (2013-2017) emission reductions targets, and being on track to meet the third (2018-2022) (HM Government, 2023), the latest CCC progress report (CCC, 2023b) states that the emissions reduction rate will need to increase significantly for the UK to meet its 2030 NDC and the Sixth Carbon Budget.

15. The proposed NMC will enable an increased capacity to be realised that aligns with SEP and DEP's increased National Grid ESO Transmission Entry Capacity (TEC) of 950MW. This additional renewable energy capacity would strengthen the projects' contributions to meeting the UK Government's ambitious target of reaching net zero by 2050, including the interim target of fully decarbonising the UK power system by 2035 (DESNZ, 2021). This will help to alleviate the risks associated with climate change such as flooding, water supply shortages and risks to health, food security and productivity, and trade.

1.3 Consultation

1.3.1 Pre-Application Consultation

16. Informal pre-application consultation has been undertaken with the MMO, Natural England and The Crown Estate (TCE) to provide a briefing on the nature of the proposed NMC application and associated DML variation. **Table 1.1** below provides a summary of the pre-application consultation undertaken to date.

Table 1.1 NMC consultation summary

Consultee	Date	Summary of Consultation
TCE	05/10/2023	Initial discussions regarding the specific details of the proposed capacity increase and to seek agreement on the scope of the NMC.
TCE	19/10/2023	Follow up discussion where TCE confirmed that any increase in capacity under the agreements for lease could only be achieved by changes to parameters which are non-material in nature.
MMO	29/04/2024	Meeting to explain what is being included in the NMC proposal and how the changes are considered to be non-material in nature. There was also a discussion of the NMC timeline. The MMO explained the approach to the DML variation aspect and requested a tracked change version of the Order be provided.
Natural England	29/04/2024	Meeting to explain what is being included in the NMC proposal and how the changes are considered to be non-material in nature. There was also a discussion of the NMC timeline. Natural England had queries in relation to whether CRM was re-run in full or used correction factors, which the Applicant subsequently confirmed by email on 06 June 2024 was re-run in full. Natural England also requested clarification that the upper confidence limits of the CRM were not increased beyond the 0.01 birds as calculated for the mean (note that for NMC RSA Band 1, there would be a very small increase in collision risk of 0.01 birds per annum for some species; however, these changes are well within the margin of error for the model and are too small to be detectable - see **Section 3**). As noted in Appendix 1, there is no requirement to present estimates using 95% confidence intervals, as relative differences would be proportionate, and therefore it was possible to conclude whether any changes would occur using mean values only. In addition, Natural England noted that the 0.01 increase in collision is not at a level that is likely to present any concerns. The additional cable length and cable crossing requirements were outlined. Natural England also raised the possibility of Oil and Gas (O&G) pipelines being decommissioned and interlink cable crossings not being required. This is considered in the paragraph below this table.
Maritime and Coastguard Agency (MCA)	29/05/2024	Meeting to present the details of the NMC in relation to shipping and navigation and to discuss wind turbine layouts. It was agreed that the proposed changes would not affect the conclusions of the Navigational Risk Assessment.
North Norfolk District Council (NNDC)	24/06/2024	Briefing on the scope of the NMC. Confirmed that it is not proposed to change the maximum design parameters of the wind turbines, apart from the Total RSA of SEP, the Total RSA of DEP, and the minimum air gap, and that there is therefore no change to the conclusions of the Landscape and Visual Impact Assessment. No comment from NNDC.

17. In response to the Natural England query in relation to O&G infrastructure, it is noted that the southern North Sea is a mature area of O&G development with numerous wells, pipelines and production platforms. Production comes primarily from gas reservoirs and is exported via pipelines to onshore terminals such as the Bacton

Gas Terminal for further processing and transmission to the downstream gas distribution network. Some of this infrastructure is now undergoing decommissioning as hydrocarbon fields reach the end of their economic life. However, in reference to the NMC proposals, for the additional interlink cable crossings required, it is assumed that the relevant Durango to Waveney, Lancelot to Bacton and Shearwater to Bacton pipelines will not be decommissioned prior to the completion of SEP and DEP's construction. Therefore, at this stage provision for crossing these pipelines is still required.

1.3.2 Post-Application Consultation

18. The 2011 Regulations set out, in Regulations 6 and 7, how the NMC application is to be published and consulted on. Regulation 6 requires a notice of the NMC application (Regulation 6 Notice) to be published for two consecutive weeks in one or more local newspapers and in any other publication necessary in order to ensure that notice of the NMC application is given in the vicinity of the land. As such, the Regulation 6 Notice will be published for two consecutive weeks in the following newspapers:

- The Eastern Daily Press; and
- North Norfolk News.

19. Furthermore, as set out in Regulation 7 of the 2011 Regulations, the Applicant is required to consult each person who has the benefit of the Order, each person that was notified of the application for the DCO and any other person who may be directly affected by the changes proposed in the NMC application. Regulation 7(3) allows for this list of consultees to be reduced with the consent of the SoS. On 26 April 2024, the Applicant wrote to the SoS to request the approval of a reduced consultee list. On 16 July 2024, the SoS confirmed their agreement to a reduced consultee list for the NMC application, with the inclusion of four additional consultees: the MCA, the Civil Aviation Authority (CAA), the Ministry of Defence (MoD) and NATS (En Route) PLC.

20. The Applicant notes that Total Energies has taken over from Shell as operator of the Shearwater to Bacton gas pipeline and will therefore be included as a consultee.

21. Steffan Aquarone MP replaced Duncan Baker as the member of parliament for North Norfolk at the General Election on 04 July 2024. Therefore, Steffan Aquarone MP has been included as a consultee, rather than Duncan Baker, who was originally included in the letter to the SoS on 26 April 2024.

22. Formal consultation on the NMC application will commence on the day of the second publication of the Regulation 6 notice and will last for four weeks. During this time stakeholders will be able to provide feedback directly to the SoS through the Planning Inspectorate's website or in writing.

23. The Applicant will contact all of the relevant consultees to inform them of the NMC application and to provide notice of the opportunity to respond to a consultation. The NMC application documents will be published on the SEP and DEP project page on the Planning Inspectorate's website.

2 Details of the Changes

24. To realise the increase in maximum generating capacity there is a need to amend design envelope parameters secured in the Order with respect to:

- An increase to the Total RSA for SEP;
- An increase to the Total RSA for DEP;
- An increase in the minimum Air Gap to ensure ornithology collision risk effects are not materially greater than those previously assessed. The potential increase will depend on the specific wind turbine procured for construction and the number of wind turbines included in the final layouts, which is explained further in **Section 2.1**;
- An increase in the maximum number of interlink cables from three to four in the event two offshore substation platforms (OSPs) are constructed (Scenarios 1(c), 1(d), 2 or 3) or in the case that only DEP is constructed (Scenario 1(b)) and from seven to eight in the event one OSP is constructed for SEP and DEP (in the SEP wind farm site, Scenario 4 in the Order) together with related increases to maximum interlink cable lengths, interlink cable protection (including crossings) area and volume and to the maximum number of interlink cable crossings for Scenarios 1(b), 1(c), 1(d), 2, 3, and 4; and
- An increase to the maximum area and volume of infield cable protection and a reduction in infield cable crossings associated with Work No. 2B for all scenarios.

25. It should be noted that the application does not seek to amend any of the following design parameters:

- The boundaries of the Order Limits;
- The upper limits of the wind turbine design envelope with respect to the number of wind turbines, rotor diameter and blade tip height;
- The minimum (1.05km) spacing between wind turbines;
- The envelope of foundation options or the upper limits of the foundation parameters (e.g. pile diameter or hammer energy);
- Any of the offshore export cable parameters;
- The disposal quantities which remain as described in the **Disposal Site Characterisation Report** [REP1-019]; and
- Any onshore elements of SEP and DEP (however considerations around the potential for changes to Electro-Magnetic Field (EMF) effects onshore are provided within this document).

26. Furthermore, the maximum number of vessel movements on site during construction and operation, as assessed within the ES is not proposed to be increased as a result of the NMC and DML variation and the construction durations and cable / wind turbine installation methods will not change from those previously assessed in the ES.

27. There is no need for additional land take as a result of the NMC, nor is there a need to amend the **Works Plans (Offshore) (Revision D)** [document reference 2.7] or the **Works Plans (Onshore) (Revision D)** [document reference 2.6].

2.1 Details of the Changes to Total Rotor Swept Area and Air Gap

28. The NMC application proposes changes to the Total RSA for SEP and Total RSA for DEP, as set out in **Table 2.1**.

29. The Total RSA is the combined swept path taken up by all wind turbine rotors within the SEP wind farm site or within the DEP wind farm site (**Figure 1**). The swept path of an individual turbine is calculated based on its rotor diameter. The Total RSA is therefore calculated by multiplying the total number of wind turbines installed by the swept area of a single wind turbine for a specific rotor diameter.

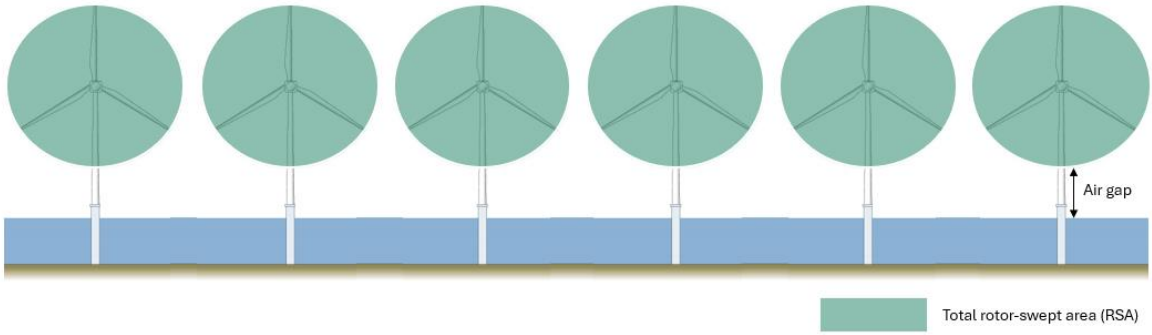

Figure 1 Total Rotor-Swept Area

30. Whilst the Order secures a maximum rotor diameter of 300 m, the Order does not allow for the maximum number of turbines (23 wind turbines in SEP and 30 wind turbines in DEP) to be installed with a 300 m rotor diameter because that would result in an exceedance of the maximum Total RSA specified in the Order. Therefore, the worst-case scenario which informed the offshore ornithology assessments in the DCO application submissions was based on 23 wind turbines in SEP and 30 wind turbines in DEP, each with a 235 m rotor diameter. In order to realise the increase in maximum generating capacity whilst ensuring the magnitude of collision risk effects is no greater than that previously assessed, three NMC RSA Bands have been defined and collision risk modelling undertaken based on the different wind turbine parameters in each NMC RSA Band. In each case, the modelled rotor diameter represents the worst-case scenario for collision risk for that RSA Band. Further detail on the wind turbine parameters for each NMC RSA Band is provided in ***Table A-3*** of Appendix A.

31. The RSA bands are set out in **Table 2.1** and explained as follows:

- **Band 1** limits Total RSA to 1.01 km^2 and 1.31 km^2 for SEP and DEP, respectively, and allows for the maximum number of turbines (23 for SEP and 30 for DEP) with a maximum rotor diameter of 236 m.
- **Band 2** limits Total RSA to 1.13 km^2 and 1.47 km^2 for SEP and DEP, respectively, and allows for the maximum number of turbines (23 for SEP and 30 for DEP) with a maximum rotor diameter of 250 m.
- **Band 3** limits Total RSA to 1.42 km^2 and 1.85 km^2 for SEP and DEP, respectively, and allows for the maximum number of turbines (23 for SEP and 30 for DEP) with a maximum rotor diameter of 280 m.

32. Band 1 represents a small increase of 0.01 km^2 in the Total RSA for both SEP and DEP when compared with the Order. This increases the maximum rotor diameter for the maximum number of turbines (23 for SEP and 30 for DEP) from 235 m to 236 m for Band 1 to allow for additional flexibility with respect to rotor diameter based on potential turbine sizes anticipated to be available prior to construction. There is no material increase in bird collision risk associated with this change and therefore no additional mitigation is required for Band 1.

33. Using the three bands allows collision risk to be calculated based on realistic worst-case wind turbine parameters for each band. It has also enabled, where necessary, additional mitigation to be applied, with an appropriate increase in the minimum Air Gap for Band 2 and Band 3. This ensures there will be no material increase in collision risk to ornithology receptors when compared to the Order parameters and assessment. For Band 2 and Band 3, the minimum Air Gap is increased with respect to the relevant Order parameter as shown in **Table 2.1**.

Table 2.1 Proposed NMC changes required for wind turbines

Parameter	Order	NMC RSA Band 1	NMC RSA Band 2	NMC RSA Band 3
Air Gap (above HAT)	30m	30m	31m	32m
SEP maximum RSA (km^2)	1.00	1.01	1.13	1.42
DEP maximum RSA (km^2)	1.30	1.31	1.47	1.85

34. To secure these parameters, the draft Amendment Order [document reference 3.1.5] proposes drafting changes to Requirement 2, Part 1 of Schedule 2 of the Order. In summary, these drafting changes result in the deletion of the single Air Gap parameter at Requirement 2(1)(d) and subsequent amendments to Requirement 2(2) and 2(3) to introduce separate tables for the SEP and DEP wind farm sites setting out the three NMC RSA Bands together with their corresponding Air Gap parameters. These drafting changes will be mirrored in Condition 1, Part 2 of Schedule 10 (Marine Licence 1: Sheringham Shoal Extension Project Offshore Generation – Work Nos. 1A, 2A and 6A or 6C) and Condition 1, Part 2 of Schedule 11 (Marine Licence 2: Dudgeon Extension Project Offshore Generation – Work Nos. 1B, 2B and 6B or 6C) as part of the associated application to vary the DMLs.

2.2 Details of the Changes to Interlink and Infield Cables

35. In order to achieve the increased capacity, one additional interlink cable is needed to connect the SEP and DEP wind farm sites. This is the case for all relevant scenarios as illustrated by **Figures 2 – 4** below.

36. For Scenarios 1(c), 1(d), 2 or 3, an increase from three to four interlink cables is needed in the event two OSPs are constructed (**Figure 2**) or in the case that only DEP is constructed (Scenario 1(b) - **Figure 2**). For all of these scenarios, the interlink cables connect an OSP in DEP-N to turbines in the DEP South array area (DEP-S). For those scenarios where two OSPs are constructed, the second OSP in SEP does not connect to any of the interlink cables and is therefore not shown in **Figure 2**.

37. For Scenario 4, an increase from seven to eight interlink cables is needed. For this scenario, the interlink cables connect the OSP in SEP to turbines in DEP-N and DEP-S.

38. These two groups of scenarios are considered in more detail in this section, including with respect to crossings of existing infrastructure by interlink and infield cables.

39. Related elements of the change are also considered with respect to cable protection area and volume parameters for infield and interlink cables and interlink cable lengths.

2.2.1 Explanation of Order Scenarios

40. The following scenarios are secured in the Order and are explained here because the changes needed for interlink cables differs depending on the scenario. Further detail on scenarios is provided in the **Scenarios Statement** [APP-314].

- Scenario 1 means each project is constructed separately in any one of the following ways: (i) the construction of SEP only where DEP does not proceed to construction (Scenario 1(a)); (ii) the construction of DEP only where SEP does not proceed to construction (Scenario 1(b)); (iii) sequential construction of SEP then DEP or vice versa (Scenario 1(c)); or (iv) concurrent construction of the two projects (Scenario 1(d)).
- Scenario 2 means the two projects are constructed sequentially and whichever project is constructed first will install the ducts for the second project.
- Scenario 3 means either SEL or DEL constructs on behalf of both itself and the other project an integrated onshore substation and connection to National Grid's Norwich Main Substation (the relevant works are identified in the Order as the scenario 3 integrated onshore works) and all other onshore and offshore works are constructed either concurrently or sequentially.

- Scenario 4 means either SEL or DEL constructs on behalf of both itself and the other project both the onshore and offshore integrated works including the integrated offshore substation, the integrated onshore substation and the onshore and offshore cables (the relevant works are identified in the Order as the integrated offshore works and the scenario 4 integrated onshore works) and all other onshore and offshore works are constructed either concurrently or sequentially.

2.2.2 Interlink and Infield Cable Crossings – Scenarios 1(b), 1(c), 1(d), 2, and 3

41. For Scenarios 1(b), 1(c), 1(d), 2, and 3 one additional interlink cable (Work No. 4B) is needed to connect the OSP in DEP-N to wind turbines in DEP-S, giving a total of four interlink cables for these scenarios.

42. For all of these scenarios, the one additional interlink cable would make up to four crossings of existing third-party infrastructure (**Figure 2** - the additional interlink cable is shown in yellow), crossing the:

- Dudgeon Export A cable;
- Dudgeon Export B cable;
- Lancelot to Bacton gas pipeline; and
- Shearwater to Bacton gas pipeline.

43. Additionally, one crossing of the Lancelot to Bacton gas pipeline and one crossing of the Shearwater to Bacton gas pipeline in DEP-S, that were considered infield cable crossings (Work No. 2B) in the Order, are more accurately considered interlink cable crossings (Work No. 4B) as the interlink cable will connect to a wind turbine within DEP-S after having crossed the existing gas pipelines (and having originated in DEP-N). These crossings are therefore reallocated accordingly from Work No. 2B to Work No. 4B as part of this NMC.

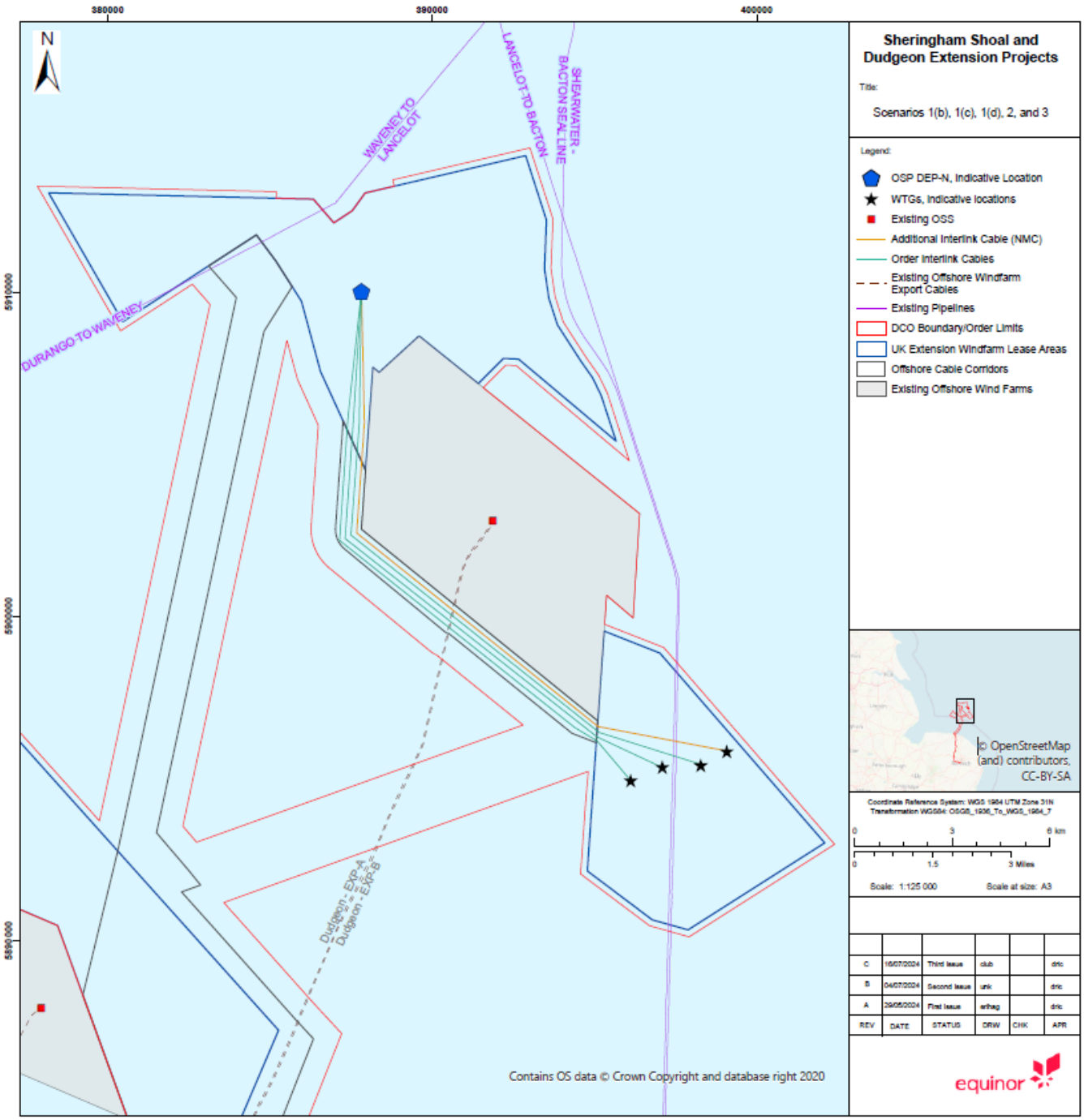

Figure 2 Interlink cable changes required in relation to Scenarios 1, 2 and 3 with four cables between DEP-N and DEP-S

44. A summary of the revised numbers of crossings for scenarios 1, 2 and 3 is as follows:

- Six interlink cable crossings (Work No. 4B) and seven infield cable crossings (Work No. 2B) were included in the Order.
- Up to an additional four interlink cable crossings are needed in relation to the one additional interlink cable, crossing the Dudgeon Export A cable, the Dudgeon Export B cable, the Lancelot to Bacton gas pipeline and the Shearwater to Bacton gas pipeline.
- There is a reallocation of two crossings in DEP-S from infield, Work No. 2B, to interlink, Work No. 4B.
- The revised numbers of crossings are therefore 12 interlink cable crossings in Work No. 4B (an increase of six) and five infield cable crossings in Work No. 2B (a reduction of two).
- There is no change to the number of crossings in relation to the offshore export cables.

2.2.3 Interlink and Infield Cable Crossings – Scenario 4

45. For Scenario 4, an increase in the maximum number of interlink cables (Work No. 4C) from seven to eight is needed in the event one OSP is constructed for SEP and DEP in the SEP wind farm site. This would result in one of the following interlink cable design configurations:

- Four interlink cables connecting the OSP in SEP to wind turbines in DEP-N and four interlink cables connecting the OSP in SEP to wind turbines in DEP-S (**Figure 4**); or
- Five interlink cables connecting the OSP in SEP to wind turbines in DEP-N and three interlink cables connecting the OSP in SEP to wind turbines in DEP-S (**Figure 4**).

46. For both of these permutations, there is one additional interlink cable (Work No. 4C) when compared to the relevant layouts reflected in the parameters in Table 4.20 of the **Project Description (Revision C)** [document reference 6.1.4]. The additional interlink cable is shown in yellow in **Figure 4** and **Figure 4**.

47. For both layout permutations considered for Scenario 4, the one additional interlink cable would make up to four crossings of existing third-party infrastructure (**Figure** 4 and **Figure 4**), crossing:

- the Dudgeon Export A cable;
- the Dudgeon Export B cable;
- the Lancelot to Bacton gas pipeline; and
- the Shearwater to Bacton gas pipeline.

48. As for the other scenarios, for Scenario 4 some of the crossings that were categorised as infield crossings in the Order are reallocated in the NMC to interlink

crossings due to the cables making the crossings prior to connecting to a wind turbine. For Scenario 4 the following crossings are accordingly reallocated from Work No. 2B to Work No. 4C:

- Two crossings of the Waveney to Durango gas pipeline;
- One crossing of the Lancelot to Bacton gas pipeline; and
- One crossing of the Shearwater to Bacton gas pipeline.

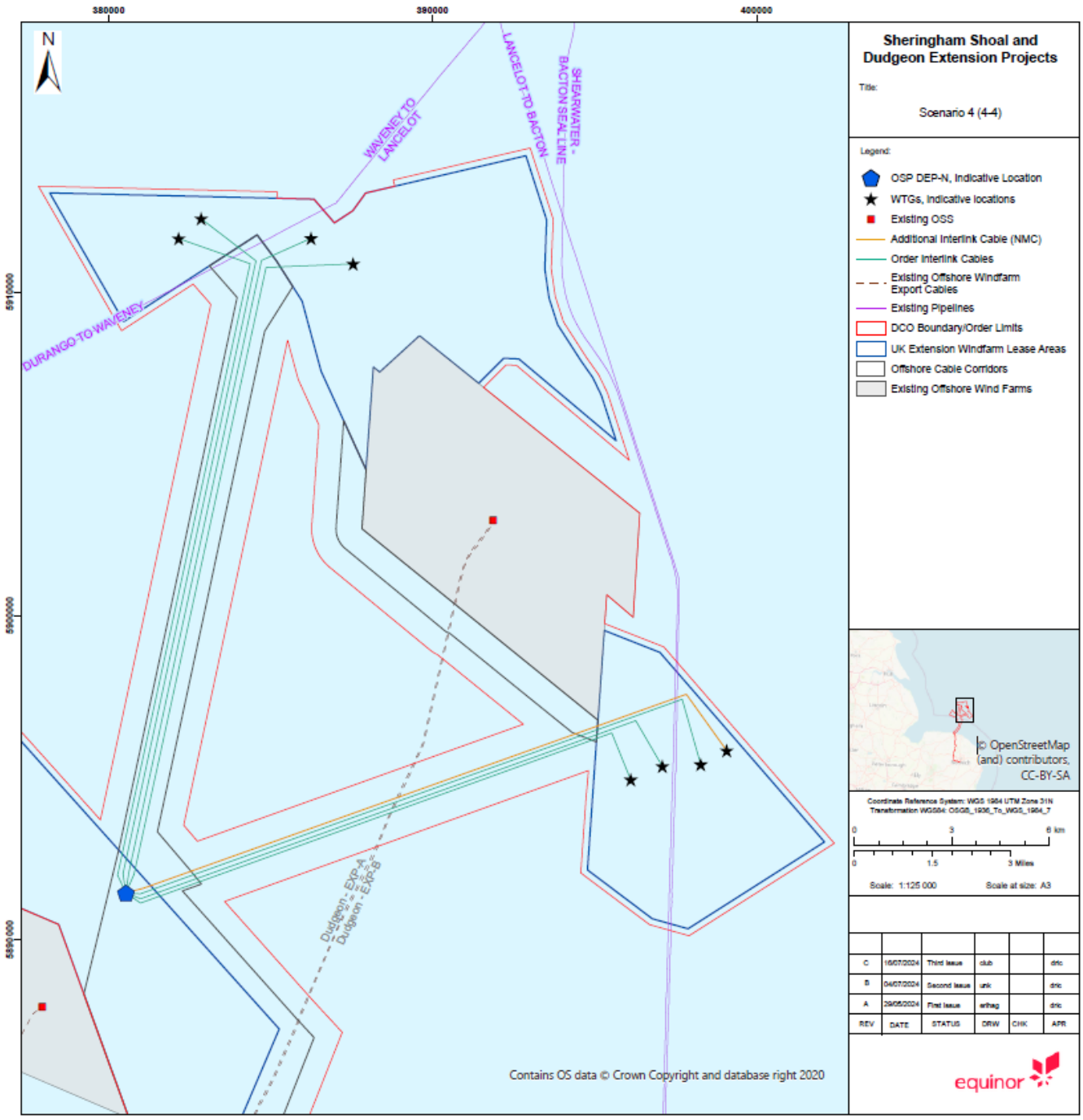

Figure 3 Interlink cable changes required in relation to Scenario 4 with four cables between SEP and DEP-N and four cables between SEP and DEP-S

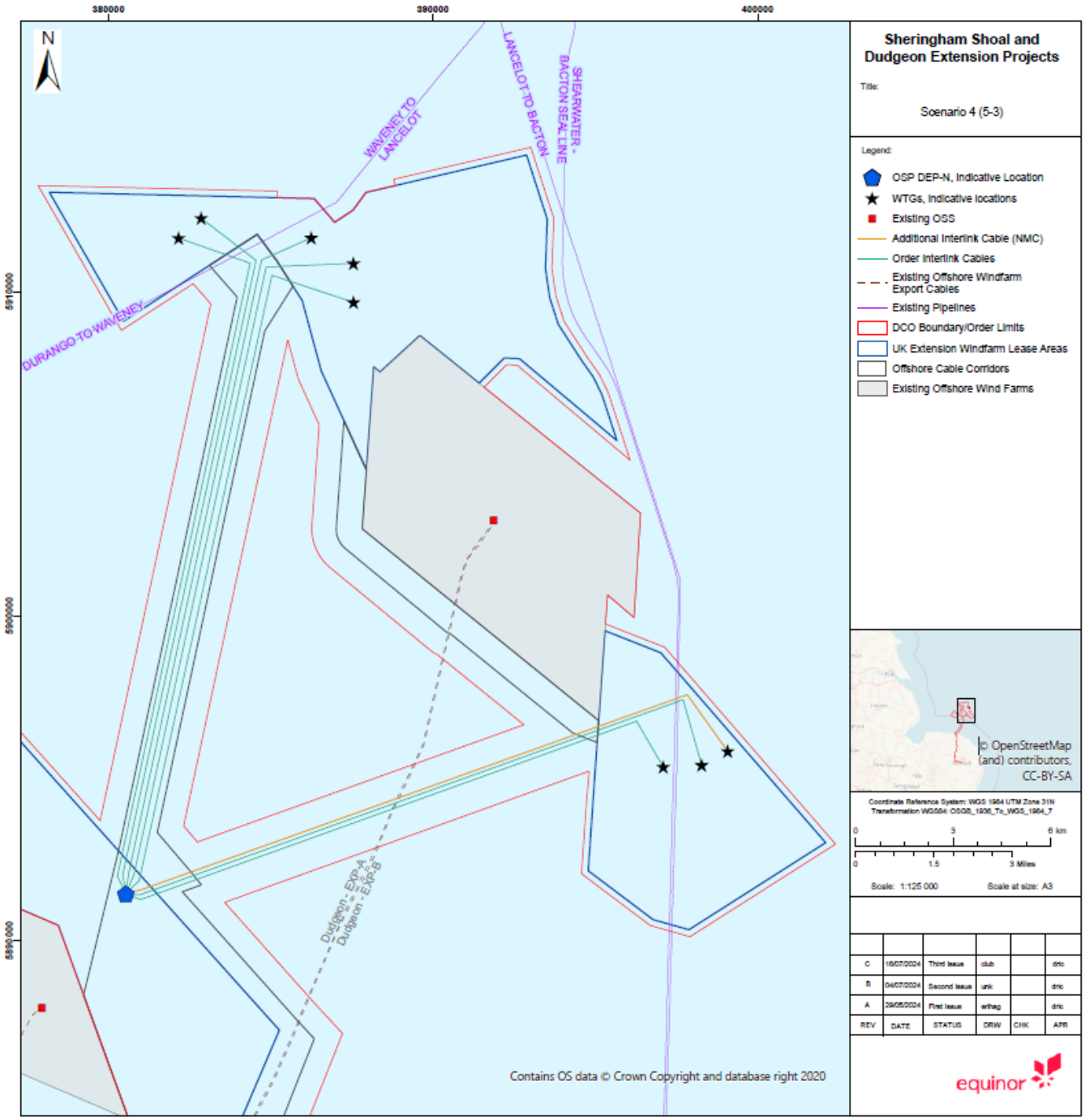

Figure 4 Interlink cable changes required in relation to Scenario 4 with five cables between SEP and DEP-N and three cables between SEP and DEP-S

49. A summary of the revised numbers of crossings for Scenario 4 is as follows:

- Six interlink cable crossings (Work No. 4C) and seven infield cable crossings (Work No. 2B) were included in the Order.
- Up to an additional four interlink cable crossings are needed in relation to the one additional interlink cable, crossing the Dudgeon Export A cable, the Dudgeon Export B cable, the Lancelot to Bacton gas pipeline and the Shearwater to Bacton gas pipeline.
- There is a reallocation of four crossings from infield, Work No. 2B, to interlink, Work No. 4B, two of which are in DEP-N and two in DEP-S.
- To provide design flexibility in relation to the wind turbine, interlink cable and infield cable layout, there is a reduction in the number of infield cable crossings (Work No. 2B) by two (rather than four).
- The revised numbers of crossings are therefore 14 interlink cable crossings in Work No. 4C (an increase of eight) and five infield cable crossings in Work No. 2B (a reduction of two).
- There is no change to the number of crossings in relation to the offshore export cables.

50. Under all relevant scenarios, the one additional interlink cable makes up to four additional crossings of third-party infrastructure. This includes crossing the two Dudgeon Offshore Wind Farm offshore export cables and crossing the two gas pipelines (Lancelot to Bacton and Shearwater to Bacton) that bisect DEP-S. Under all relevant scenarios there is a reallocation of some of the crossings from infield to interlink.

2.2.4 Additional Cable Protection

51. The Order includes parameters for the area and volume of cable protection (including cable crossings) for both interlink and infield cables.

52. Additional external cable protection for the extra interlink cable will be required where it crosses existing third-party infrastructure and also for ground conditions unsuitable for cable burial.

53. The Applicant has undertaken a recalculation of the realistic maximum volume at crossings based on a recent review of best practice for cable crossing designs. The Applicant has also sought to better align the area and volume parameters for interlink and infield cables secured in the Order with those used in the **Project Description (Revision C)** [document reference 6.1.4] to inform the assessments in the ES.

54. Whilst external cable protection volumes do not inform the ES assessments, these are secured in the Order and therefore need to be updated as part of this NMC and DML variation proposal.

55. With respect to interlink cables (Work No. 4B / 4C) and DEP infield cables (Work No. 2B) under all relevant scenarios, the cable protection (including cable crossings) area and volume parameters need to be amended in the Order to reflect:

- An update of the interlink and infield cable protection (including cable crossings) area and volume parameters. This is to better reflect the assumptions that informed the parameters that were assessed in the ES, but which were not fully incorporated into the values secured in the Order, particularly in relation to the width of cable protection at cable crossing locations and the full extent of external cable protection. A 15 m cable protection width at crossing locations has been assumed for this NMC. This is lower than the value of 21 m that was used in the calculations that informed the assessment in the ES, thus attenuating the overall increase in the relevant cable protection (including crossings) area and volume parameters.
- A recalculation of the interlink and infield cable protection volume following a recent review of best practice for cable crossing design in relation to the realistic maximum volume at crossings.

2.2.5 Additional Interlink Cable Length

56. The interlink cable lengths used in the ES and secured in the Order were calculated on the basis of the distance between wind farm site / array area boundaries, e.g. from the boundary of the SEP wind farm site to the boundary of the DEP-N array area. In practice, interlink cables will connect an OSP from within one wind farm site / array area to a wind turbine within another wind farm site / array area; or in other words, they have to extend beyond the boundary of each wind farm site / array area to a point within it. As such, the lengths secured in the DCO do not provide the necessary design flexibility. This NMC application therefore proposes an increase to interlink cable lengths to account for the additional cable length required to reach the relevant OSP or wind turbine within the wind farm site / array area boundaries.

57. **Table 2.2** details the specific changes proposed to interlink and infield cable parameters by scenario and work no. and provides a comparison with the parameters assessed in the ES and those secured in the Order. All other parameters with respect to interlink and infield cables would remain as secured in the Order.

58. **Section 2.2.6** provides additional comparison of worst-case assessment parameters (i.e. temporary physical disturbance areas, sediment displacement volumes and permanent habitat loss areas) which are not secured in the Order but which are relevant to the ES assessments.

Table 2.2 Proposed NMC changes required for interlink and infield cables – separated by scenario and work number

ID	Parameter	Order Reference	Secured in the Order	Assessed in the ES	Draft Amendment Order Parameter	Explanation of Amendment
Scenarios 1, 2, 3 and 4						
Work No. 2B						
1	Number of infield crossings	Schedule 2, Part 1, Requirement 7(2)(a)	7	7	5	Two crossings which were previously allocated to in field cables have been re-allocated to interlink cables to reflect that the relevant interlink cable connects to a wind turbine after having made the crossings.
2	Infield cable protection area (including cable crossings) – DEP (m^2)	Schedule 2, Part 1, Requirement 7(2)(a)	4,000	18,700	13,590	Changed to better reflect the design assumptions in relation to the length of infield cable protection and infield cable crossing protection that informed the parameter assessed in the ES.
3	Infield cable protection volume (including cable crossings) – DEP (m^3)	Schedule 2, Part 1, Requirement 7(2)(a)	1,000	N/A[2]	6,900	The volume of infield cable crossings needs to be increased following a review of best practice for the

[2] Note that external cable protection volumes do not factor into the ES assessments.

ID	Parameter	Order Reference	Secured in the Order	Assessed in the ES	Draft Amendment Order Parameter	Explanation of Amendment
						realistic maximum volume at crossings.
Scenarios 1, 2 and 3						
Work No. 4B						
4	Maximum number of interlink cables total	Schedule 2, Part 1, Requirement 7(5)(a)	3	3	4	One additional interlink cable is required to realise an increased generating capacity.
5	Maximum interlink cable length (km)	Schedule 2, Part 1, Requirement 7(5)(b)	66	66	92	As a result of the change to the number of interlink cables, this parameter requires updating. It also accounts for an increase to the length of the original 3 interlink cables to reflect the additional distance between the wind farm site / array area boundaries and the relevant OSP or wind turbine, which was not previously included. This maximum value reflects a layout where four interlink cables connect DEP-N and DEP-S (23.1 km per cable).
6	Maximum number of crossings	Schedule 2, Part 1, Requirement 7(5)(c)	6	6	12	Change to increase the number of crossings. This reflects the four additional crossings associated with

ID	Parameter	Order Reference	Secured in the Order	Assessed in the ES	Draft Amendment Order Parameter	Explanation of Amendment
						the one additional interlink cable. It further reflects one crossing of the Lancelot to Bacton pipeline and one crossing of the Shearwater to Bacton pipeline, which have been reallocated from infield crossings to interlink crossings.
7	Interlink cable protection area (including cable crossings) (m^2)	Schedule 2, Part 1, Requirement 7(5)(d)	6,708	21,600	22,216	Calculations have been aligned more closely to those assessed in the ES. The ES assumed a cable crossing width of 21m; however, following a review of cable crossing designs, the NMC amendment is based on a reduced cable crossing width of 15m. The increase in this parameter reflects the increased number of cable crossings.
8	Interlink cable protection volume (including cable crossings) (m^3)	Schedule 2, Part 1, Requirement 7(5)(e)	1,896	N/A	13,960	The volume of interlink cable crossings needs to be increased following a review of best practice for the realistic maximum volume at crossings and to reflect the increased number of crossings.

ID	Parameter	Order Reference	Secured in the Order	Assessed in the ES	Draft Amendment Order Parameter	Explanation of Amendment
Scenario 4						
Work No. 4C						
9	Maximum number of interlink cables SEP and DEP total	Schedule 2, Part 1, Requirement 7(7)(a)	7	7	8	One additional interlink cable is required to realise an increased generating capacity. The additional eighth interlink cable between SEP and DEP will be routed to DEP-S in all Scenario 4 layouts (see **Figure 4** and **Figure** 4).
10	Maximum interlink cable length (km)	Schedule 2, Part 1, Requirement 7(7)(b)	154	143[3]	224	As a result of the change to the number of interlink cables, this parameter requires updating. It also accounts for an additional increase to the length of the original 7 interlink cables to reflect the additional distance between the wind farm site / array area boundaries and the relevant OSP or wind turbine, which was not previously included.

[3] As noted in Chapter 9 Benthic Ecology [APP-094], while a scenario where only the DEP-N array area is built out would require a greater length of interlink cables (154km compared to 143km), overall, the worst-case area subject to temporary habitat loss / disturbance would be a scenario where both DEP-N and DEP-S are built out, in which case the 143km length of interlink cables applies.

ID	Parameter	Order Reference	Secured in the Order	Assessed in the ES	Draft Amendment Order Parameter	Explanation of Amendment
						This maximum value reflects a layout where five interlink cables connect SEP and DEP-N (29.7 km per cable) and three interlink cables connect SEP and DEP-S (25.3 km per cable).
11	Maximum number of crossings	Schedule 2, Part 1, Requirement 7(7)(c)	6	6	14	Change to increase the number of crossings. This reflects the four additional crossings associated with the one additional interlink cable. It further reflects two crossings of the Durango to Waveney pipeline, one crossing of the Lancelot to Bacton pipeline and one crossing of the Shearwater to Bacton pipeline, which have been reallocated from infield crossings to interlink crossings.
12	Interlink cable protection area (including cable crossings)	Schedule 2, Part 1, Requirement 7(7)(d)	12,708	21,600	30,252	Calculations have been aligned more closely to those assessed in the ES. The ES assumed a cable crossing width of 21m; however, following a review of cable crossing designs, the NMC amendment is based on a reduced cable crossing width of 15m.

ID	Parameter	Order Reference	Secured in the Order	Assessed in the ES	Draft Amendment Order Parameter	Explanation of Amendment
						The increase in this parameter reflects the increased number of cable crossings.
13	Interlink cable protection volume (m^3)	Schedule 2, Part 1, Requirement 7(7)(e)	3,396	N/A	17,370	The volume of interlink cable crossings needs to be increased following recalculation of the realistic maximum volume at crossings and to reflect the increased number of crossings.

2.2.6 Comparison of Environmental Statement and Non-Material Change Worst-Case Scenarios

59. **Table 2.3** and **Table 2.4** provide a comparison of the worst-case scenarios which informed some of the relevant ES assessments for interlink and infield cables, against the updated values which have been calculated based on the amended parameters for this NMC application.

Table 2.3 Comparison of ES and NMC worst-case scenarios for interlink cables

Parameter	ES	Secured in the Order / Order Equivalent	NMC
Total maximum length of all interlink cables for one OSP scenario where both DEP-N and DEP-S are developed (i.e. Scenario 4, which is the overall worst-case for relevant assessments in ES Chapters 6, 7, 8 and 9) (km)	143 [1]	154	224.4
Worst-case interlink cable temporary habitat loss / physical disturbance footprint (km^2)	2.15 [1]	2.31	3.37
Worst-case interlink cable sediment displacement volume which informs suspended sediment concentration (SSC) and seabed level impacts (m^3)	160,875 [1]	172,847	252,450
Permanent habitat loss footprint (m^2)	21,600	N/A	30,252
Cable repair and reburial requirements temporary disturbance footprint (m^2)	4,704 per year for all cables for a SEP and DEP one OSP scenario.	N/A	5,558.7 per year for all cables for a SEP and DEP one OSP scenario.

[1] As noted in Chapter 9 Benthic Ecology [APP-094], while a scenario where only the DEP-N array area is built out would require a greater total length of interlink cables (154km compared to 143km), overall, the worst-case area subject to temporary habitat loss / disturbance would be a scenario where both DEP-N and DEP-S are built out, in which case the 143km length of interlink cables applies.

Table 2.4 Comparison of ES and NMC worst-case temporary physical disturbance area and sediment displacement volume calculations for DEP infield cables

ID	Parameter	ES	NMC
1	Total maximum length of all infield cables (km)	135	No change
2	Worst-case infield cable temporary habitat loss / physical disturbance footprint assessed (km^2)	2.025	
3	Worst-case infield cable sediment displacement volume assessed which informs SSC and seabed level impacts (m^3)	151,875	
4	Permanent habitat loss footprint (m^2)	18,700	13,590

60. Given that there is no increase in the temporary habitat loss / physical disturbance footprint or cable sediment displacement volume for infield cables, there is no requirement to consider this for the relevant ES assessments in **Table 3.1**.

61. Regarding permanent habitat loss footprints, taking the changes needed for interlink (**Table 2.3**) and infield (**Table 2.4**) cables together results in an overall increase in the permanent habitat loss footprint of 8.8% (3,542m^2) compared to that assessed in the ES.

3 Consideration of the Effects of the Change on the Environmental Statement

62. This section considers the potential implications of the NMC in relation to all relevant topics assessed within the ES.

63. Changes to the Total RSA for the Projects have the potential to increase collision risk affecting ornithology receptors.

64. For NMC RSA Band 1, there would be a very small increase in collision risk of 0.01 birds per annum for Sandwich tern, kittiwake, lesser black-backed (LBB) gull and common tern. These changes are well within the margin of error for the model and are too small to be detectable. Natural England confirmed at a meeting on 29 April 2024 that increases of this scale were not likely to be a concern (**Table 1.1**). For NMC RSA Bands 2 and 3, the proposed increases in Air Gap would ensure no material increase in collision risk. Collision risk modelling has been undertaken for each NMC RSA Band and is presented in **Appendix A Collision Risk Modelling**. There would therefore not be a change to the conclusions of the ES (**Table A-4**).

65. With respect to the increase in the number and length of interlink cables, an increase in the temporary habitat loss / physical disturbance and suspended sediment concentration worst-case scenarios would occur due to the additional length of cable (**Table 2.3**). However, these impacts would be intermittent and temporary, and the existing mitigation measures such as micro-siting and the production of a benthic mitigation scheme would ensure sensitive benthic features are avoided and impacts minimised, as required. This is discussed further for the relevant impacts in **Table 3.2**.

66. As described above, the permanent habitat loss worst-case scenarios have increased by 8.8% (3,542m^2) due to the increased external cable protection required for additional cable crossings and for allowance for ground conditions unsuitable for cable burial.

67. The change to cable parameters is primarily relevant to the benthic ecology assessment; however, it is also linked to a number of other receptor topic assessments which have impact pathways linked to temporary physical disturbance of the seabed or the presence of infrastructure on the seabed.

68. Additionally, whilst there is no requirement to amend the Order parameters for onshore or offshore export cables, given the increase in generation capacity, there is a requirement to consider an increased potential for EMF emissions for both onshore and offshore receptors. An update to **Appendix 28.1 Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects EMF Assessment** [APP- 279] has been submitted with this NMC application in line with

the capacity increase associated with the NMC which is considered, as appropriate, in **Table 3.2**.

69. **Table 3.1** considers the effects of the proposed changes to Total RSA and Air Gap for wind turbines and whether they are likely to result in any new or materially different likely significant effects to those assessed in the ES which would trigger the need for an update to the ES.

70. **Table 3.2** considers the effects of the proposed changes to interlink and infield cable parameters and whether they are likely to result in any new or materially different likely significant effects to those assessed in the ES which would trigger the need for an update to the ES.

71. All other receptors and associated impacts not included in **Table 3.1** or **Table 3.2** are not considered to be relevant to this proposed NMC and DML variation request, either because there is no impact pathway or because any changes would be within the limits of natural variation.

Table 3.1 Assessment of how changes to Total RSA and Air Gap sought by this NMC would affect the relevant ES conclusions

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
Chapter 10 Marine Mammals [APP-096]	Underwater noise and vessel collision impacts	Regarding underwater noise impacts from piling, Table 4-2 of **Appendix 10.2 Underwater Noise Modelling (Revision B)** [REP8-019] describes the worst-case ramp-up scenario upon which the underwater noise modelling and assessments are based. This assumes worst-case durations at various hammer energies up to 5,500kJ. The maximum hammer energy of 5,500kJ is not being changed by this NMC nor is the maximum pile diameter. Therefore, the underwater noise modelling results and underwater noise assessments in **Marine Mammals Technical Note and Addendum (Revision B)** [REP7-056] would not change as a result of this NMC. Regarding underwater noise impacts from vessels and increased risk of collision with vessels, the number of construction and O&M vessels assessed in **Marine Mammals Technical Note and Addendum (Revision B)** [REP7-056] would not change as a result of this NMC and therefore accordingly the assessments would not change. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on marine mammals.**

Chapter 11 Offshore Ornithology [APP-097]	<u>O&M</u>
	• Impact 4: Collision risk | assessment conclusion = **minor adverse**
		The parameters which inform the assessment of collision risk are specifically secured in the Order through the requirements and conditions detailed **Table 2.1**.
		
		Regarding O&M Impact 4, updated collision risk modelling (CRM) has been undertaken for each species considered within the EIA and the results are provided in Appendix A. This updated modelling considers worst-case scenarios, covering each of the three NMC RSA Bands proposed for the NMC, as follows:
		• NMC RSA Band 1 (max RSA 2.32km^2, minimum 30m Air Gap):
		  ○ 23 wind turbines at SEP, 30 wind turbines at DEP; 236m rotor diameter for each wind turbine
		• NMC RSA Band 2 (max RSA 2.60 km^2, minimum 31m Air Gap):
		  ○ 23 wind turbines at SEP, 30 wind turbines at DEP; 250m rotor diameter for each wind turbine

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
		• NMC RSA Band 3 (max RSA 3.27km^2, minimum Air Gap 32m) ○ 23 wind turbines at SEP, 30 wind turbines at DEP; 280m rotor diameter for each wind turbine For each case, the results of the modelling are presented in Appendix A. Whilst there would be an increase in the number of predicted per annum collisions for some species of 0.01, this is not at a scale that would change the assessment conclusions. It should also be noted that Article 45 of the Order includes a legal mechanism to secure the release of the ornithological headroom from the Dudgeon Offshore Wind Farm (DOW). ES Chapter 11 Offshore Ornithology [APP-097] presents a range of cumulative scenarios for Sandwich tern, using various combinations of consented and as-built OWFs. These show the difference between realistic (i.e. as-built) scenarios compared to the unrealistic (consented) scenarios. Whilst quantification of the headroom release has only been undertaken for Sandwich tern, headroom would also be released for other species. Article 45 is triggered by the commencement of the relevant DEP works. Whilst SEL and DEL did not rely on any scenario that uses as-built parameters (i.e. headroom) in the assessment conclusions its consideration provides greater certainty (precaution) to the conclusions of the ES and those reached in this report. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on ornithology.**
Chapter 15 Aviation and Radar [APP-101]	<u>Construction and O&M</u> • Impact 1: Creation of an obstacle to fixed wing and rotary aircraft operating offshore. • Impact 2: Wind turbines causing permanent interference on civil and military radar systems. • Impact 3: Disruption to aircraft using HMRs.	The potential impacts to aviation and radar are driven by: • The boundaries of the Order Limits – the total area of spatial impact with potential for radar interference. • The upper limits of the wind turbine design envelope with respect to blade tip height – influencing flight altitude (including Norwich Airport air traffic control minimum safe altitude chart) and low flying aircraft operations. • The spacing between wind turbines - for low flying operations and maintenance of line of sight (particularly for search and rescue (SAR) - see ES Chapter 14 Shipping and Navigation [APP-102]).

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
	• Impact 4: Impact to Air Traffic Control Surveillance Minimum Altitude Chart	Under the proposed NMC, maximum blade tip height, the boundaries of the Order Limits and the spacing between turbines/ turbine rows are to remain unchanged and, as such, the outcomes of the EIA and mitigation proposed remain valid. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on aviation and radar.**
Chapter 14 Shipping and Navigation [APP-099]	Construction and O&M Impact 7: Emergency Services	The final layout of the SEP and DEP wind farm sites is required to be agreed with the MCA and Trinity House. The layout must be such that it allows continued and safe access for SAR. This includes the arrangement of wind turbines in straight lines with at least one clear line of sight and maintenance of adequate spacing between turbine rows. Under the NMC, no changes to turbine or turbine row spacing are proposed and the final layout will adhere to lines of sight requirements. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on SAR.**
Chapter 16 Petroleum Industry and Other Marine Users [APP-102]	Construction and O&M Impact 1: Potential interference with oil and gas operations	Concerns were raised during EIA consultation regarding maintenance of line of sight between Bacton gas terminal and the Blythe platform. Any changes to the final layout arising from the NMC will be made with due consideration of the commitment to maintenance of line-of-sight requirements. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on petroleum industry and other marine users.**
Chapter 25 SVIA [APP-111]	Potential impacts on seascape, landscape and/or visual resources located within the SVIA's 'Zone of Visual Influence' (ZVI), which defines the anticipated main area of visibility in the SVIA's study area.	The SVIA is informed by parameters associated with the aspects of SEP and DEP which determine the extent of the wind turbine structures visible above the sea and the requirements of the construction activities for the offshore components. Chapter 25 is based on a realistic worst-case scenario (RWCS), which identifies where the greatest potential impacts on seascape, landscape and visual resources would arise from the offshore components.

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
		The following factors were identified and agreed upon as representing the RWCS for seascape, landscape and visual resources: • The longest duration for the construction and operation phases; • The maximum footprint and height (above sea level) that the turbines would occupy; • The maximum height of the wind turbine hubs and blades; • The maximum quantity of the turbines; • The possible arrangement of the turbines and their perceived visual density/relationship with landform/perspective; and • The relationship of turbines with the horizon, available views of the open sea, and/ or existing offshore wind farms. The NMC and the DML variation are consistent with the above factors, with all relevant project design parameters (to the SVIA) still secured in the Order through the requirements and conditions (see **Table 2.1**). Furthermore, the NMC or DML variation will not increase the maximum number of vessel movements proposed during SEP and DEP's construction and operational phases and, therefore, the SVIA's conclusions remain valid concerning the construction and decommissioning activities and their potential impacts on seascape, landscape and/or visual resources. Whilst the number and length of interlink cables and associated external cable protection are proposed to be increased by this NMC application (**Table 2.2**), these parts of the Project's offshore components will not affect seascape, landscape and/ or visual resources. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on seascape, landscape and visual resources.**

Table 3.2 Assessment of how changes to interlink and infield cable parameters being sought by this NMC would affect the relevant ES conclusions

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
Chapter 6 Marine Geology, Oceanography and Physical Processes [APP-092]	Impacts assessed within Chapter 6 which are of relevance to the NMC and DML variation are: <u>Construction</u> • Impact 5: Changes in suspended sediment concentrations (SSCs) due to offshore cable installation (infield and interlink cables) | assessment conclusion = **no impact** • Impact 6: Change in sea bed level due to offshore cable installation (infield and interlink cables) | assessment conclusion = **negligible adverse** <u>Operation and maintenance (O&M)</u> • Impact 5: Morphological and sediment transport effects due to cable protection measures within the SEP and DEP wind farm sites and interlink cable corridor | assessment conclusion = **negligible adverse** • Impact 7: Cable repairs and reburial | assessment conclusion = **negligible adverse** <u>Decommissioning</u> • Impact 5: Changes in SSCs due to removal of parts of the infield and interlink cables | assessment conclusion = **no impact** • Impact 6: Changes in sea bed level due to removal of parts of the infield and interlink cables | assessment conclusion = **negligible adverse**	The relevant assessments for Marine Geology, Oceanography and Physical Processes are informed by parameters associated with the length of interlink and infield cables, the volume of displaced sediment (which can lead to increases in SSCs and seabed level) and the areas of external cable protection on the seabed. The parameters which inform the assessment are specifically secured in the Order through the requirements and conditions detailed in rows 9 to 12 of **Table 2.2** and rows 1 and 4 of **Table 2.4**. Regarding construction impact 5, the effects on suspended sediment concentrations due to infield and interlink cable installation will have no impact upon the identified receptor groups for marine geology, oceanography and physical processes. This is because the receptors are dominated by processes that are active along the seabed and are not affected by sediment suspended in the water column. Therefore, there would be no change to the 'no impact' assessment conclusion as a result of this NMC application. Regarding construction impact 6, the evidence-based assessment in the ES suggests that coarser sediment disturbed during cable installation would fall rapidly to the seabed (minutes or tens of minutes) as a highly turbid dynamic plume immediately after it is discharged. Deposition of this sediment would form a linear mound (likely to be tens of centimetres high) parallel to the cable as the point of release moves along the excavation. Due to the coarser sediment particle sizes observed across the site (predominantly medium-grained sand), a large proportion of the disturbed sediment would behave in this manner and be similar in composition to the surrounding seabed. This would mean that there would be no

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
		significant change in seabed sediment type. A very small proportion of mud would also be released to form a passive plume and become more widely dispersed before settling on the seabed. The conceptual evidence-based assessment suggests that due to the dispersion by tidal currents, and subsequent deposition and re-suspension, the deposits across the wider seabed would be very thin (millimetres). Whilst there would be an increase in the volume of displaced sediment (and therefore the potential for increases in seabed level) as a result of the updated parameters proposed for this NMC (**Table 2.3**), these effects on sea bed level are considered highly unlikely to have the potential to impact directly upon the identified receptor groups for marine geology, oceanography and physical processes. Any impacts will be of lower magnitude than those seabed level impacts considered for the installation of foundations. Consequently, the overall impact of infield and interlink cable installation considered in the NMC application is not at a scale that would result in a change to the 'negligible adverse' assessment conclusion. Regarding O&M impacts 5 and 7, the 8.8% increase in worst-case external interlink cable protection parameter and the increase in cable repair and reburial requirements (**Table 2.3**) is not at a scale that would result in a change to the 'negligible adverse' assessment conclusions. Regarding decommissioning impacts 5 and 6, whilst there is the potential for an increase in SSCs and seabed level due to an increase in the length of interlink cable potentially being required to be removed, this would not result in a change to the assessment conclusions which in any case would be less than, or at worst equal to, those assessed for construction.

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
		Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on Marine Geology, Oceanography and Physical Processes.
Chapter 7 Marine Water and Sediment Quality [APP-093]	Construction • Impact 4: Deterioration in water quality due to an increase in suspended sediment during offshore cable installation (infield and interlink cables) | assessment conclusion = **negligible adverse** • Impact 5: Deterioration in water quality due to the release of contaminated sediment | assessment conclusion = **negligible adverse** O&M • Impact 1: Deterioration in water quality through an increase in suspended sediment due to cable repairs / reburial | assessment conclusion = **negligible adverse**	The relevant assessments for Marine Water and Sediment Quality are informed by parameters associated with the length of interlink and infield cables and the volume of displaced sediment (which can lead to increases in SSCs and potential for remobilisation of contaminated sediment). The parameters which inform the assessment are specifically secured in the Order through the requirements and conditions detailed in row 10 of **Table 2.2**. Regarding construction impacts 4 and 5, whilst there would be an increase in the volume of displaced sediment as a result of the updated parameters proposed for this NMC (**Table 2.3**), this is not at a scale that would result in a change to the 'negligible adverse' assessment conclusions which are informed by the assessments in Chapter 6 Marine Geology, Oceanography and Physical Processes. Regarding O&M Impact 1, the increase in worst-case interlink cable length would not result in an increase to the cable repair and reburial requirements that would be at a scale to change the 'negligible adverse' assessment conclusion (**Table 2.3**). **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on Marine Water and Sediment Quality.**
Chapter 8 Benthic Ecology [APP-094]	Construction • Impact 1: Temporary habitat loss / physical disturbance | assessment conclusion = **minor adverse**	The relevant assessments for Benthic Ecology are informed by parameters associated with the length of interlink and infield cables, the volume of displaced sediment (which can lead to increases in

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
	• Impact 2: Temporary increases in SSCs and deposition | assessment conclusion = **minor adverse** • Impact 3: Remobilisation of contaminated sediments | assessment conclusion = **no impact** <u>O&M</u> • Impact 1: Temporary habitat loss / physical disturbance | assessment conclusion = **minor adverse** • Impact 2: Permanent habitat loss | assessment conclusion = **minor adverse** • Impact 4: Temporary increases SSC and deposition | assessment conclusion = **negligible adverse** • Impact 5: Colonisation of foundations and cable protection | assessment conclusion = **minor adverse** • Impact 7: Invasive Non-Native Species (INNS) | assessment conclusion = **minor adverse** <u>Decommissioning</u> • Impact 1: Temporary habitat loss / physical disturbance | assessment conclusion = **minor adverse** • Impact 2: Permanent habitat loss | assessment conclusion = **minor adverse** • Impact 3: Temporary increases in SSC and deposition | assessment conclusion = **negligible adverse** • Impact 6: INNS | assessment conclusion = **minor adverse**	SSCs and the potential for remobilisation of contaminated sediment) and the areas of external cable protection. The parameters which inform the assessment are specifically secured in the Order through the requirements and conditions detailed in rows 9 to 12 of **Table 2.2** and rows 1 and 4 of **Table 2.4**. Regarding construction Impact 1, there would be an increase in the area of temporary habitat loss and physical disturbance (**Table 2.3**) within the interlink cable corridors. Figure 8.6 of ES **Chapter 10 Benthic Ecology** [APP-121] shows that the interlink cable corridors are primarily comprised of a mosaic of subtidal mixed and subtidal coarse sediment. Within the DEP wind farm sites, sediments are comprised of a mosaic of subtidal mixed and subtidal coarse sediment interspersed with subtidal sand. Whilst there would be a modest increase in the area of temporary habitat loss / physical disturbance (**Table 2.3**) as a result of this NMC, disturbance effects would be temporary and intermittent over a construction period of up to two years. The increased area of disturbance is considered to be small in the context of the extent of these benthic habitats present across the wider southern North Sea. A temporary (for part of the project duration) change, over a small area of the receptor is anticipated. As secured through the Order, a mitigation scheme for any benthic habitats of conservation, ecological and/or economic importance constituting Annex I reef habitats identified by preconstruction surveys and in accordance with the offshore in principle monitoring plan would ensure any identified Annex I reef habitats were avoided. In light of the above, whilst there would be a modest increase in temporary habitat loss / physical disturbance footprint, this is not at a scale that would result in a change to the 'minor adverse' assessment conclusion.

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
		Regarding construction Impacts 2 and 3, there would be an increase in the volume of displaced sediment as a result of the updated parameters proposed for this NMC (**Table 2.3**) and therefore increased potential for suspended sediments to smother benthic features. ES **Chapter 10 Benthic Ecology** [APP-094] notes that the sensitivities of the biotopes associated with the habitats present across the DEP wind farm site in relation to the pressures of increased SSC and deposition indicates that all biotopes are either not sensitive or have a low sensitivity to these pressures. There is no requirement for an increase in sandwave levelling from that assessed in the ES which has far greater potential to result in an increase in SSCs. Whilst the increased interlink cable length increases the volume of displaced sediment, overall, increases in SSCs are expected to be localised at the point of discharge and short-term. Therefore, the increased sediment displacement volume is not at a scale that would result in a change to the 'minor adverse' assessment conclusion. Regarding O&M Impacts 1 and 4, the increase in worst-case interlink cable length (**Table 2.2**) would result in an increase in seabed disturbance area due to the cable repair and reburial requirements. Based on this relatively small increase alongside the above considerations of the benthic environment in DEP and the interlink cable corridors, this is not at a scale that would change the 'minor adverse' or 'negligible adverse' assessment conclusions. Regarding O&M Impacts 2, 5 and 7, the overall increase in external cable protection area (**Section 2.2.4**), whilst resulting in an 8.8% increase in the area of the seabed being subject to permanent habitat loss and introducing infrastructure that could increase the potential for colonisation of cable protection and spread of INNS, this would not be at a scale that would change the 'minor adverse' assessment conclusions.

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
		Regarding decommissioning impacts, whilst there is the potential for an increase in temporary habitat loss / physical disturbance, temporary increases in SSCs, permanent habitat loss, remobilisation of contaminated sediments and introduction of INNS due to the increased length of interlink cable and the area of external interlink cable protection, this would not be at a scale that would change the assessment conclusions which in any case would be no greater than those during construction. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on Benthic Ecology.**
Chapter 9 Fish and Shellfish Ecology [APP-095]	<u>Construction</u> • Impact 1: Temporary habitat loss / physical disturbance | assessment conclusion = **minor adverse** • Impact 2: Temporary increases in SSC and deposition | assessment conclusion = **minor adverse** • Impact 3: Remobilisation of contaminated sediments | assessment conclusion = **negligible adverse** <u>O&M</u> • Impact 1: Temporary habitat loss / physical disturbance | assessment conclusion = **negligible adverse** • Impact 2: Permanent habitat loss | assessment conclusion = **minor adverse** • Impact 4: Introduction of wind turbine foundations, scour protection and hard substrate | assessment conclusion = **minor adverse**	The relevant assessments for Fish and Shellfish Ecology are informed by parameters associated with the length of interlink and infield cables, the volume of displaced sediment (which can lead to increases in SSCs and the potential for remobilisation of contaminated sediment) and the areas of external cable protection. The parameters which inform the assessment are specifically secured in the Order through the requirements and conditions detailed in rows 9 to 12 of **Table 2.2** and rows 1 and 4 of **Table 2.4**. In reference to the proposed NMC regarding construction Impact 1, whilst there would be an increase in the area of temporary habitat loss and physical disturbance (**Table 2.3**), this is not at a scale that would result in a change to the 'minor adverse' assessment conclusion. Regarding construction Impacts 2 and 3, whilst there would be an increase in the volume of displaced sediment as a result of the updated parameters proposed for this NMC (**Table 2.3**), this is not at a scale that would result in a change to the 'minor adverse' or 'negligible adverse' assessment conclusions.

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
	• Impact 5: Increased suspended sediments and sediment redeposition | assessment conclusion = **negligible adverse** • Impact 6: Remobilisation of contaminants from sea bed sediment | assessment conclusion = **negligible adverse** • Impact 8 EMF | assessment conclusion = **minor adverse** <u>Decommissioning</u> • Impact 1: Temporary habitat loss / physical disturbance | assessment conclusion = **minor adverse** • Impact 2: Permanent habitat loss | assessment conclusion = **minor adverse** • Impact 3: Temporary increases in SSC and deposition | assessment conclusion = **minor adverse** • Impact 4: Remobilisation of contaminated sediments | assessment conclusion = **negligible adverse**	Regarding O&M Impacts 1, 5 and 6, the increase in worst-case interlink cable length (**Table 2.2**) would not result in an increase to the cable repair and reburial requirements that would be at a scale to change the 'negligible adverse' assessment conclusions. Regarding O&M Impacts 2, and 4, the overall increase in external cable protection area, whilst resulting in a slightly increased area (8.8%) of the seabed being subject to permanent habitat loss and introducing hard substrate, this would not be at a scale that would change the 'minor adverse' assessment conclusions. Regarding O&M Impact 8, Appendix B provides an update to Appendix 28.1 - Sheringham and Dudgeon Extension Projects EMF Assessment [APP-279]. There is no change predicted to the EMF levels predicted at third-party crossings nor maximum magnetic fields produced by the worst-case design option. Whilst there would be an increase in potential for EMF interaction as a result of the additional interlink cable, because of the physical properties of EMF, specifically that they are what is known as "vectors" not "scalars" (i.e. have direction as well as magnitude), the magnitudes of the EMF from multiple different sources do not simply add together. Therefore, potential magnitude of effect on fish and shellfish receptors will not increase above the predicted EMF value of 26.5µT (assuming a cable buried at 1m depth) at the sea bed (which is under background measurements of 50µT in the southern North Sea). All reasonable endeavours would be made to bury cables below the seabed as secured through the **Outline CSCB MCZ Cable Specification and Installation Monitoring Plan** [REP7-031]. Therefore, overall, the increase in interlink cable length would not be at a scale that would change the 'minor adverse' assessment conclusions. Regarding decommissioning impacts, whilst there is the potential for an increase in temporary habitat loss / physical disturbance,

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
		temporary increases in SSCs, permanent habitat loss, remobilisation of contaminated sediments and introduction of INNS due to the increased length of interlink cable and the area of external interlink cable protection, this would not be at a scale that would change the assessment conclusions which in any case would be no greater than those during construction. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on Fish and Shellfish Ecology.**
Chapter 10 Marine Mammals [APP-096]	<u>Construction and O&M</u> • Changes to prey resources | assessment conclusion = **negligible to minor adverse** • Underwater noise and vessel collision impacts	Changes to marine mammal prey resources are informed by the worst-case assumptions in the Benthic Ecology and Fish and Shellfish Ecology assessments for temporary habitat loss / physical disturbance, increases in SSCs, remobilisation of contaminated sediments and permanent habitat loss calculations. Given the relative increases to these worst-case assumptions would not change the conclusions of the assessments for Benthic Ecology and Fish and Shellfish Ecology, the conclusions for marine mammal prey resources would also not change. Regarding underwater noise impacts from vessels and increased risk of collision with vessels, the number of construction and O&M vessels assessed in **Marine Mammals Technical Note and Addendum (Revision B)** [REP7-056] would not change as a result of this NMC and therefore accordingly the assessments would not change. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on marine mammals.**

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
Chapter 11 Offshore Ornithology [APP-097]	Construction, O&M and Decommissioning • Indirect Effects Through Effects on Habitats and Prey Species during the Construction Phase | assessment conclusion = **minor adverse**	Regarding indirect effects through effects on habitats and prey species during all phases, the same justification as provided above for marine mammals would also apply to offshore ornithology. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on ornithology.**
Chapter 12 Commercial Fisheries [APP-098]	Construction • Impact 1: Construction activities and physical presence of constructed wind farm site infrastructure leading to reduction in access to, or exclusion from established fishing grounds | assessment conclusion = **negligible to minor adverse** • Impact 5: Construction activities leading to displacement or disruption of commercially important fish and shellfish resources | assessment conclusion = **negligible to minor adverse** O&M • Impact 2: Physical presence of the proposed offshore export cable and interlink cables leading to reduction in access to, or exclusion from established fishing grounds | assessment conclusion = **negligible to minor adverse** • Impact 4: Physical presence of the wind farm site, offshore export cable and interlink cables leading to gear snagging | assessment conclusion = **negligible to minor adverse**	The relevant assessments for Commercial Fisheries are informed by parameters associated with construction activities relating to the installation of wind turbines, interlink and infield cables and the physical presence of the cables and associated external cable protection on the seabed. The parameters which inform the assessment are specifically secured in the Order through the requirements and conditions detailed in rows 9 to 12 of **Table 2.2** and rows 1 and 4 of **Table 2.4**. There is no change to the maximum number of wind turbines, minimum wind turbine spacing requirements nor the maximum area of offshore development as secured in the Order. Furthermore, the maximum number of vessel movements on site during construction and operation, as assessed within the ES is not proposed to be increased as a result of the NMC and DML variation. Whilst the number and length of interlink cables, and associated external cable protection is proposed to be increased by this NMC application (**Table 2.2**), this would not be at a scale that would change the 'negligible to minor adverse' assessment conclusions. There would be an increase in the temporary habitat loss / physical disturbance area as a result of this proposed NMC however as this is not at a scale that would change the conclusions of the Fish and Shellfish Ecology assessment, it would also not change the

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
		conclusions of construction Impact 5 in relation to disruption of commercially important fish and shellfish resources. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on commercial fisheries.**
Chapter 13 Shipping and navigation [APP-099]	Construction • Impact 5: Interaction with partially completed subsea cables | assessment conclusion = **minor adverse** • Impact 6: Under Keel Clearance | assessment conclusion = **minor adverse** O&M • Impact 5: Interaction with subsea cables | assessment conclusion = **minor adverse** • Impact 6: Under Keel Clearance | assessment conclusion = **minor adverse** Decommissioning • Impact 5: Interaction with subsea cables | assessment conclusion = **minor adverse** • Impact 6: Under Keel Clearance | assessment conclusion = **minor adverse**	The relevant assessments for Shipping and Navigation are informed by parameters associated with construction activities relating to the installation of wind turbines, interlink and infield cables and the physical presence of the cables and associated external cable protection on the seabed. The parameters which inform the assessment are specifically secured in the Order through the requirements and conditions detailed in rows 9 to 12 of **Table 2.2** and rows 1 and 4 of **Table 2.4**. There is no change to the maximum number of wind turbines, minimum wind turbine spacing requirements nor the maximum area of offshore development as secured in the Order. Furthermore, the maximum number of vessel movements on site during construction and operation, as assessed within the ES is not proposed to be increased as a result of the NMC and DML variation. Whilst the number and length of interlink cables, and associated external cable protection is proposed to be increased by this NMC application (**Table 2.2**), this would not be at a scale that would change the 'minor adverse' assessment conclusions regarding interactions with subsea cables. Any additional cable protection will not exceed MCA maximum limits for changes to charted depths (up to 5% in surrounded charted depths referenced to Chart Datum).

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
		Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on Shipping and Navigation.
Chapter 14 Offshore Archaeology and Cultural Heritage [APP-100]	Construction • Impact 1: Direct (physical) impact to known heritage assets | assessment conclusion = **minor adverse** • Impact 2: Direct impact to potential heritage assets | assessment conclusion = **minor adverse** • Impact 3: Indirect impact to heritage assets from changes to physical processes | assessment conclusion = **no impact** O&M • Impact 3: Indirect impact to heritage assets from changes to physical processes | assessment conclusion = **no impact**	The relevant assessments for Offshore Archaeology and Cultural Heritage are informed by parameters associated with the length of interlink and infield cables, the volume of displaced sediment (which can lead to increases in seabed level resulting in indirect impact to heritage assets) and the areas of external cable protection on the seabed which could interact with heritage assets. The parameters which inform the assessment are specifically secured in the Order through the requirements and conditions detailed in the rows 9 to 12 of **Table 2.2** and rows 1 and 4 of **Table 2.4**. Regarding construction Impacts 1 and 2, whilst there would be an increase in the area of disturbance (**Table 2.3**) and therefore potential for effect on heritage assets, this would be managed through further investigation and mitigation, as set out in the **Outline Written Scheme of Investigation (Offshore)** [APP-298] submitted with the DCO application, and there would be no change to the 'minor adverse' assessment conclusion. Regarding construction Impacts 2 and 3, whilst there would be an increase in the volume of displaced sediment as a result of the updated parameters proposed for this NMC (**Table 2.3**), this is not at a scale that would result in a change to the 'no impact' or 'minor adverse' assessment conclusions. Regarding indirect impact to heritage assets from changes to physical processes, given that there would be no change to the assessment conclusions for Chapter 6, there would therefore be no change to the

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
		no impact conclusions for the impact on heritage assets as a result of changes to physical processes. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on Offshore Archaeology and Cultural Heritage.**
Chapter 16 Petroleum Industry and Other Marine Users [APP-102]	Construction • Impact 3: Potential impacts on subsea cables and pipelines | assessment conclusion = **minor adverse** O&M • Impact 3: Potential impacts on subsea cables and pipelines | assessment conclusion = **minor adverse**	The relevant assessments for Petroleum Industry and Other Marine Users are informed by parameters associated with the interlink and infield cables alongside the vessel anchoring and construction activity requirements for these aspects of the project design. The parameters which inform the assessment are specifically secured in the Order through the requirements and conditions detailed in rows 11 and 12 of **Table 2.2** and rows 1 and 4 of **Table 2.4**. Regarding impacts on subsea cables and pipelines, there is a requirement for an increase in the number of interlink cable and pipeline crossings (**Table 2.2**). As per the existing approach for cable and pipeline crossings, SEL and DEL will enter into proximity and crossing agreements with the affected cable owners and operators. The requirement for the additional cable and pipeline crossings is not a scale that would change the minor adverse assessment conclusions. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on the Petroleum Industry and Other Marine Users.**
Chapter 19 Land Use, Agriculture and Recreation [APP-105]	O&M • Impact 6: Potential impacts on soil heating | assessment conclusion = **minor adverse**	The transmission of electricity results in energy losses in the form of heat dissipation. **ES Chapter 19 – Land Use, Agriculture and Recreation** [REP2-022] submitted at Deadline 2 of the SEP & DEP Examination sets out the following: “The potential impact of any potential soil heating on agricultural production could affect crop growth. The effects of soil heating are

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
		only likely to be limited to the area above the onshore cables. However, the thermal resistivity of the material immediately surrounding the cables has a much greater bearing on heat dissipation and the backfill would be selected for its properties in this respect, reducing impact and potential for soil heating. It is therefore considered that the sensitivity of receptor is medium." The conclusion of the ES chapter is that "the installation of the onshore cable will result in no change in the temperature at the ground surface, and very small increases in topsoil temperature (less than 1°C in the principal root growth zone)." Overall, the magnitude of effect is therefore assessed as negligible. While there is the possibility of some additional heat dissipation proportional to the increase in generation capacity, the scale of this would be similar to that assessed in the ES and therefore would not change the minor adverse assessment conclusions (magnitude of effect is likely to remain as negligible). Notwithstanding this, as set out within the **Outline Code of Construction Practice** [REP8-023] submitted at Deadline 8 of the SEP & DEP Examination, thermal analyses will be carried out during detailed design and this will inform the final cable design and burial cross section design to ensure compliance with applicable standards (paragraph 44 of the OCoCP). **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on Land Use, Agriculture and Recreation.**
Chapter 28 Health [APP-114]	<u>Operation:</u> • Impact 8: EMF Effects | assessment conclusion = No significant effect	The Human Health assessment is informed by parameters associated with the aspects of SEP and DEP which generate EMF, i.e. the export cables.

ES Topic	Impacts and Assessment Conclusions Described in the ES Chapter which are relevant to this NMC	Potential for Change in Assessment Conclusions as a Result of Changes Sought Through this NMC
		Appendix 28.1 Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects EMF Assessment [APP-279] submitted with the DCO application has been updated in Appendix B in line with the capacity increase associated with the NMC. The Government, acting on the advice of authoritative scientific bodies, has put in place appropriate measures to protect the public from EMFs. These measures comprise compliance with the relevant exposure limits, and one additional precautionary measure, optimum phasing, applying only to high-voltage overhead power lines. These measures are set out in a Written Ministerial Statement, National Policy statement EN-5, and various Codes of Practice. The updated report submitted as part of this NMC Application (document reference 6.3.28.1: Appendix 28.1 - Sheringham and Dudgeon Extension Projects EMF Assessment (Revision B)) concludes that all of the proposed technology options for the SEP and DEP export cables and third-party crossing points would be fully compliant with government policy. Specifically, all the fields produced would be significantly below the relevant exposure limits. Therefore, there would be no significant EMF effects resulting from this proposed development. For most designs evaluated, the magnetic fields reduce to a background level at the DCO boundary. **Therefore, the proposed NMC and DML variation will result in no new, or materially different, likely significant effects on Human Health.**

4 Consideration of the Effects of the Change on the Habitats Regulations Assessment, Stage 1 Marine Conservation Zone Assessment and European Protected Species Licensing

72. **Table 3.1** confirms that the NMC will result in no new, or materially different, likely significant effects on the environment in respect of ornithological receptors. Specifically, for the three proposed NMC RSA Bands, increases in RSA, when accompanied by the proposed additional mitigation with regards to minimum Air Gap for Bands 2 and 3, would result in no material increase in collision risk to any seabird species assessed within the ES. Indeed, in the case of Bands 2 and 3 there would be a reduction in collision risk for most species when compared to the worst-cast scenario assessed in the ES (see **Table A-4**). Accordingly, there would be no increase in predicted collisions apportioned to any Special Protection Area (SPA) population.

73. Regarding potential indirect effects on The Wash and North Norfolk Coast Special Area of Conservation (SAC), the pathway of effect relates to changes in bedload sediment transport from external export cable protection which is not being changed by this NMC. There would therefore be no change to the conclusion of no adverse effect on site integrity as assessed in the **Report to Inform Appropriate Assessment (RIAA)** [APP-059].

74. Regarding potential indirect effects on the Inner Dowsing, Race Bank and North Ridge SAC, potential effects from increased suspended sediment concentrations and deposition during construction, operation and decommissioning were assessed in the **RIAA** [APP-059]. The pathway of effect assessed was in relation to seabed preparation for gravity-base foundations (GBS) for wind turbines. The worst-case number of GBS foundations is not being changed by the proposed NMC and there would therefore be no change to the conclusion of no adverse effect on site integrity as assessed in the **RIAA** [APP-059].

75. Regarding the **Stage 1 Cromer Shoal Chalk Beds Marine Conservation Zone (MCZ) Assessment** [REP7-023], because the proposed changes being sought by this NMC and DML variation all occur for infrastructure that would be located outside of the MCZ (i.e. no changes to the offshore export cable are required), there would be no effect on any aspect of that assessment.

76. All cetacean species are listed as European Protected Species (EPS) under Annex IV of the Habitats Directive and are therefore protected from the deliberate killing (or injury), capture and disturbance throughout their range. Grey and harbour seal are also protected under the Conservation of Habitats and Species Regulations 2017 and The Conservation of Offshore Marine Habitats and Species Regulations 2017, as well as The Conservation of Seals Act 1970.

77. The Applicant's position at the submission of the DCO application was that it was anticipated that an application for a European Protected Species licence would be submitted post-consent. This position is not altered as a result of this NMC proposal or DML variation.

78. It should be noted that TCE is in the process of undertaking an update to the plan-level HRA for the 2017 Extension Application Projects ('the Extension Projects', of

which SEP and DEP is part) to enable increases in generation capacity of these projects within their existing seabed lease footprints. The Extension Projects are at different stages of development, with SEP and DEP, having received consent on 17 April 2024, requiring an NMC in order to realise the increase in generation capacity. As noted in **Table 1.1**, TCE confirmed that any increase in capacity under the agreements for lease could only be achieved by changes to parameters which are non-material in nature (which is demonstrated by the conclusions reached in this report).

79. TCE is seeking to grant the increased capacity, subject to the successful conclusion of the plan-level HRA process.

5 Consideration of the Effects of the Change on Land Rights

80. As stated in **Section 1.1** *"A change should be treated as material that would authorise the compulsory acquisition of any land, or an interest in or rights over land that was not authorised through the existing DCO."*

81. The proposed change applies to offshore activities being undertaken within the existing Order limits and Order land in offshore areas that will be leased by TCE. As such, the possible requirement for compulsory acquisition does not arise.

6 Consideration of the Effects of the Change on Local People

82. As stated in **Section 1.1** *"The potential impact of the proposed changes on local people will also be a consideration in determining whether a change is material."*

83. As discussed in **Section 2**, the proposed NMC only affects parameters associated with the Total RSA and Air Gap alongside interlink and infield cable parameters. It does not affect the offshore export cable corridor, onshore export cable corridor, or onshore substation (and associated works). In addition, as discussed in **Section 3**, the NMC and associated DML variation would not result in any new or materially different impacts to seascape and visual. Therefore, onshore, local communities will not be affected.

84. Furthermore, as discussed in **Section 3**, the NMC and associated DML variation would not result in any new or materially different impacts on commercial fisheries and shipping and navigation receptors and therefore the proposed NMC and DML variation will not affect local offshore stakeholders.

85. In summary, there will be no change to the upper limits with respect to the number of wind turbines, rotor diameter and blade tip height. Increases to the number and maximum length of interlink cables and the associated footprints of interlink cable protection is proposed for this NMC and associated DML variation; however, the proposed change will not change the impact conclusions stated in the ES (**Section 3**) or the HRA and Stage 1 MCZ Assessment (**Section 4**). No onshore changes to SEP and DEP are proposed, nor will any onshore changes be required, as a result of this NMC application. Therefore, there will be no change to compulsory acquisition powers (**Section 5**). Given the nature of the offshore changes proposed, no other impacts on local communities (either onshore or offshore) would arise.

7 Conclusion

86. SEL and DEL is seeking to amend the Order for SEP and DEP to increase the Total RSA for SEP and DEP and increase the number and length of interlink cables and the associated external interlink cable protection parameters in order to realise an increase in generation capacity. The maximum number of infield cable crossings is being reduced while infield external cable protection parameters are being increased.

87. This Supplementary Environmental Report has given consideration to the four tests outlined in the 2015 Department for Communities and Local Government Guidance on Changes to Development Consent Orders, and it has been demonstrated in sections **3**, **4**, **5** and **6** that the proposed amendments would be non-material in nature. There would be no new or materially different likely significant effects when compared with those described in the ES. Similarly, there would be no changes to the HRA or Stage 1 MCZ Assessment conclusions, no requirement for additional powers of compulsory acquisition, and no other impacts as a result of the proposed change on local communities, either onshore or offshore.

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Appendix A Collision Risk Modelling

Introduction

1. This appendix provides and update to the collision risk modelling (CRM) presented as part of the assessment of the Sheringham Shoal Offshore Wind Farm Extension Project (SEP) and Dudgeon Offshore Wind Farm Extension Project (DEP) on offshore ornithology receptors. The update has been undertaken as part of the non-material change (NMC) submission for SEP and DEP, which proposes increased rotor swept areas (RSAs) for the consented Projects. The CRM update compares the predicted collision mortality for seabird species assessed as part of the DCO submission, as documented in the **Environmental Statement (ES) Appendix 11.1 of Chapter 11 Offshore Ornithology** [APP-195] and **Collision Risk Modelling (CRM) Updates (EIA Context) Technical Note (Revision B)** [REP3-089]. The updated CRM confirms that there would be no measurable change to the predicted mortality to seabird species assessed within the ES.

Approach

2. The collision estimates have been calculated using Option 2 of the Band (2012) CRM, in accordance with the approach used for the DCO submission, for the following species:
   - Sandwich Tern
   - Gannet
   - Kittiwake
   - LBB Gull
   - Great black-backed (GBB) Gull
   - Little Gull
   - Black-headed Gull
   - Common Gull
   - Common Tern
   - Herring Gull

3. For the first six of these species (Sandwich tern to little gull), updated collision estimates were presented during the SEP and DEP Examination within the **Collision Risk Modelling (CRM) Updates (EIA Context) Technical Note (Revision B)** [REP3-089], to reflect updated avoidance rates (ARs) advised by Natural England following submission of the DCO application. For the remaining four species (black-headed gull to herring gull), no updates to the collision estimates were presented post-submission. For completeness, the updated CRMs presented in this document have compared collision estimates as follows:
   - For the six species where CRM using updated ARs were presented during DCO Examination, these have been compared to the NMC RSA Bands using the same updated ARs.

- For the four species where no updates were presented during Examination, the collision estimates for the Order parameters have been re-estimated using the updated avoidance rates advised by Natural England (in Appendix B1 of the Natural England Relevant Representations [RR-063]), and both these and the original collision estimates have been compared against the NMC RSA scenarios for both updated and original ARs respectively. These results are presented in Annex I.

4. As the purpose of the updated CRMs was to confirm that there would be no measurable increase in collision risk under the proposed NMC RSA Bands, the re-estimates have been based on mean density estimates only. There was no requirement to also present estimates using 95% confidence intervals, as relative differences would be proportionate, and therefore it was possible to conclude whether any changes would occur using mean values only. Similarly, in respect of Sandwich tern, the **Environmental Statement (ES) Appendix 11.1 of Chapter 11 Offshore Ornithology** [APP-195] and **Collision Risk Modelling (CRM) Updates (EIA Context) Technical Note (Revision B)** [REP3-089] presented a range of scenarios, using both model- and design-based density estimates, and different flight speeds, for this species. For this update, only the 'worst-case' (using model-based density estimates and flight speed of Fijn and Gyimesi (2018)) has been presented.

5. Three NMC RSA Bands are proposed for the NMC, with corresponding minimum Air Gap (height of lowest point of rotor tip above highest astronomical tide (HAT)). These, together with the corresponding Order parameters, are presented in **Table A-1**.

Table A-1 Proposed changes to Rotor Swept Area for the Non-Material Change Application

Scenario	Order	NMC RSA Band 1 [1]	NMC RSA Band 2	NMC RSA Band 3
Air Gap (above HAT)	30m	30m	31m	32m
SEP max number of wind turbines	23	23	23	23
DEP max number of wind turbines	30	30	30	30
SEP max RSA (km^2)	1.00	1.01	1.13	1.42
DEP max RSA (km^2)	1.30	1.31	1.47	1.85
Max RSA SEP and DEP (km^2)	2.30	2.32	2.60	3.27

[1] Represents the worst-case scenario for NMC application ornithology CRM.

* Note that for the assessment, the wind turbine rotor diameters upon which Total RSA has been calculated have been rounded to the nearest whole metre.

6. Collision risk has been estimated for each of the NMC RSA Bands proposed, as follows:

- NMC RSA Band 1 (max RSA 2.32km^2, minimum 30m Air Gap):

- 23 wind turbines at SEP, 30 wind turbines at DEP; 236m rotor diameter for each wind turbine.

- NMC RSA Band 2 (max RSA 2.60km^2, minimum 31m Air Gap):
  - 23 wind turbines at SEP, 30 wind turbines at DEP; 250m rotor diameter for each wind turbine.
- NMC RSA Band 3 (max RSA 3.27km^2, minimum Air Gap 32m):
  - 23 wind turbines at SEP, 30 wind turbines at DEP; 280m rotor diameter for each wind turbine.

CRM inputs

Seabird Densities

7. The density estimates used in the CRM are unchanged from the original assessment and are presented in ES **Appendix 11.1** of **Chapter 11 Offshore Ornithology** [APP-195]. As discussed above, CRMs have been undertaken using the mean densities only.

Flight Height

8. All updated CRMs use Option 2 of the Band Model (2012). For Sandwich tern, the flight height distribution was obtained from Harwood (2021). All other species used data from previously published flight height distributions ("Corrigendum," 2014; Johnston et al., 2014).

Avoidance Rates

9. Updated avoidance rates were taken from Appendix B1 of the Natural England RR [RR-063]. The source of these avoidance rates is a Joint Nature Conservation Committee (JNCC) report that was in preparation at the time of Examination, but now published (Ozsanlev-Harris *et al.*, 2023). These are presented in ***Table A-2***.

Biometric and Other Parameters

10. The biometric and other parameters required for the updated CRM were taken from either Appendix B1 of the Natural England RR [RR-063] or **Appendix 11.1** of **Chapter 11 Offshore Ornithology** [APP-195]. They are presented in ***Table A-2***.

Table A-2 Avoidance rates and other input parameters used in updated CRM

Species	Avoidance rate for DCO	Updated avoidance rate	Flight speed (m/s)	Nocturnal activity	Body length	Wingspan	Flight type	% flights upwind
Sandwich tern	0.990	n/a	10.3	2%	0.39	1.00	Flapping	50
Gannet	0.992[1]	n/a	14.9	8%	0.94	1.72	Flapping	50
Kittiwake	0.992	n/a	13.1	50%	0.39	1.08	Flapping	50
Great black-backed gull	0.994	n/a	13.7	50%	0.71	1.58	Flapping	50
Lesser black-backed gull	0.994	n/a	13.1	50%	0.58	1.42	Flapping	50
Little gull	0.990	n/a	12.2	25%	0.26	0.78	Flapping	50
Black-headed Gull	0.980	0.995	11.9	50%	0.37	1.10	Flapping	50
Common Gull	0.980	0.995	13.4	50%	0.42	1.30	Flapping	50
Common Tern	0.980	0.990	10.5	0%	0.33	0.88	Flapping	50
Herring Gull	0.995	0.994	12.8	50%	0.60	1.44	Flapping	50

Notes
[1] In addition to this avoidance rate, a macro-avoidance correction factor of 0.7 has been applied, as per Appendix B1 of the Natural England RR [RR-063]

Windfarm Parameters

11. Key windfarm parameters used in the updated CRM are presented in ***Table A-3***.

Table A-3 Key windfarm parameters used in updated CRM

Scenario	DCO	NMC RSA Band 1	NMC RSA Band 2	NMC RSA Band 3
SEP max RSA (km^2)	1.00	1.01	1.13	1.42
DEP max RSA (km^2)	1.30	1.31	1.47	1.85
Max RSA SEP and DEP (km^2)	2.30	2.32	2.60	3.27
Rotor diameter (m)	235	236	250	280
Air gap (m)	30	30	31	32
No. of turbines SEP	23	23	23	23
No. of turbines DEP	30	30	30	30
Total number of turbines	53	53	53	53
Maximum blade width (m)	7.5	7.5	8	8
Average blade pitch at mean predicted wind speed (degrees)	0	0	0	0
Rotor radius (m)	117.5	118	125	140
Average rotation speed at mean predicted wind speed (rpm)	5.66	5.66	5.57	5.20

Results

12. The results of the CRM updates are summarised in ***Table A-4***, with full outputs presented in Annex I. The original ES CRM spreadsheets are available on request. ***Table A-4*** confirms that there is no measurable increase in predicted collision mortality for all scenarios. For NMC RSA Band 1, it is noted that for Sandwich tern, kittiwake, lesser black-backed gull and common tern, a non-material increase (0.01 birds per annum) is predicted for the combined effects of SEP and DEP, when compared to the DCO parameters. This increase is well within the bounds of error for the model, and is inconsequential for the conclusions of the assessment. For all other scenarios, collision estimates are unchanged or reduced when compared to DCO collision estimates. This also applies (as would be expected) for the four species irrespective of the avoidance rates used, assuming that collision estimates using the same avoidance rates are compared. Overall, therefore, **it is concluded that for all scenarios proposed for the NMC submission, there would be no measurable increase in collision mortality, and no change to the assessment conclusions presented in the relevant DCO submission documents.**

Table A-4 CRM update summary, showing combined SEP and DEP annual mortality, using the most recent avoidance rates advised by Natural England. Green shading = collision risk below that previously assessed

Scenario	DCO	NMC RSA Band 1	NMC RSA Band 2	NMC RSA Band 3
Species / Rotor diameter	**235m**	**236m**	**250m**	**280m**
Sandwich Tern	7.04	7.05	6.08	5.06
Gannet	1.06	1.06	1.01	0.93
Kittiwake	12.41	12.42	11.97	11.02
LBB Gull	2.21	2.22	2.20	2.08
GBB Gull	5.98	5.98	5.98	5.72
Little Gull	2.89	2.89	2.78	2.55
Black-headed Gull	0.43	0.43	0.41	0.37
Common Gull	0.99	0.99	0.97	0.91
Common Tern	0.68	0.69	0.64	0.57
Herring Gull	0.30	0.30	0.30	0.29

References

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Johnston, A., Cook, A.S.C.P., Wright, L.J., Humphreys, E.M., Burton, N.H.K., 2014. Modelling flight heights of marine birds to more accurately assess collision risk with offshore wind turbines. Journal of Applied Ecology 51, 31–41. https://doi.org/10.1111/1365-2664.12191

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Appendix B Updated Collision Risk Modelling Outputs

	Original Submission (235m) (30m Air Gap; 23 turbines at SEP, 30 turbines at DEP)						NMC RSA Band 1 - 236m (30m Air Gap; 23 turbines at SEP, 30 turbines at DEP)						NMC RSA Band 2 - 250m (31m Air Gap; 23 turbines at SEP, 30 turbines at DEP)						NMC RSA Band 3 - 280m (32m Air Gap; 23 turbines at SEP, 30 turbines at DEP)					
	SEP original AR	SEP updated AR	DEP original AR	DEP updated AR	SEP&DEP Original (as submitted AR)	SEP&DEP Updated (new AR)	SEP original AR	SEP updated AR	DEP original AR	DEP updated AR	SEP&DEP Original (as submitted AR)	SEP&DEP Updated (new AR)	SEP original AR	SEP updated AR	DEP original AR	DEP updated AR	SEP&DEP Original (as submitted AR)	SEP&DEP Updated (new AR)	SEP original AR	SEP updated AR	DEP original AR	DEP updated AR	SEP&DEP Original (as submitted AR)	SEP&DEP Updated (new AR)
Sandwich Tern	1.69	n/a	5.35	n/a	7.04	n/a	1.69	n/a	5.36	n/a	7.05	n/a	1.46	n/a	4.62	n/a	6.08	n/a	1.21	n/a	3.85	n/a	5.06	n/a
Gannet	0.16	n/a	0.90	n/a	1.06	n/a	0.16	n/a	0.90	n/a	1.06	n/a	0.16	n/a	0.86	n/a	1.01	n/a	0.14	n/a	0.79	n/a	0.93	n/a
Kittiwake	1.47	n/a	10.94	n/a	12.41	n/a	1.47	n/a	10.95	n/a	12.42	n/a	1.42	n/a	10.55	n/a	11.97	n/a	1.31	n/a	9.71	n/a	11.02	n/a
LBB Gull	0.64	n/a	1.57	n/a	2.21	n/a	0.64	n/a	1.58	n/a	2.22	n/a	0.64	n/a	1.56	n/a	2.20	n/a	0.60	n/a	1.48	n/a	2.08	n/a
GBB Gull	4.41	n/a	1.57	n/a	5.98	n/a	4.41	n/a	1.57	n/a	5.98	n/a	4.41	n/a	1.57	n/a	5.98	n/a	4.22	n/a	1.50	n/a	5.72	n/a
Little Gull	0.53	n/a	2.36	n/a	2.89	n/a	0.53	n/a	2.36	n/a	2.89	n/a	0.51	n/a	2.27	n/a	2.78	n/a	0.47	n/a	2.08	n/a	2.55	n/a
Black-headed Gull[1]	0.46	0.12	1.23	0.31	1.69	0.43	0.46	0.12	1.23	0.31	1.69	0.43	0.45	0.11	1.19	0.30	1.64	0.41	0.41	0.10	1.09	0.27	1.50	0.37
Common Gull[1]	2.07	0.52	1.88	0.47	3.95	0.99	2.07	0.52	1.88	0.47	3.95	0.99	2.04	0.51	1.85	0.46	3.89	0.97	1.91	0.48	1.73	0.43	3.64	0.91
Common Tern[2]	0.37	0.18	1.00	0.50	1.37	0.68	0.37	0.19	1.01	0.50	1.38	0.69	0.35	0.17	0.94	0.47	1.29	0.64	0.31	0.15	0.84	0.42	1.15	0.57
Herring Gull[3]	0.00	0.00	0.25	0.30	0.25	0.30	0.00	0.00	0.25	0.30	0.25	0.30	0.00	0.00	0.25	0.30	0.25	0.30	0.00	0.00	0.24	0.29	0.24	0.29

Cells show predicted mortality (birds per annum), based on Option 2 of the Band (2012) spreadsheet.
[1] For black headed gull and common gull, original submission AR=98.0%, updated AR=99.5%
[2] For common tern, original submission AR=98.0%, updated AR=99.0%
[3] For herring gull, submission AR=99.5%, updated AR=99.4%