DBS Offshore Wind

RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Dogger Bank South Offshore Wind Farms

Appendix A Fish and Shellfish Environmental Assessment Update

Document Date:	January 2025
Document Reference:	10.50
Revision Number:	01
Classification:	Unrestricted

RWE MASDAR

Company:	**RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited**	Asset:	**Development**
Project:	**Dogger Bank South Offshore Wind Farms**	Sub Project/Package	**Consents**
Document Title or Description:	Appendix A Fish and Shellfish Environmental Assessment Update		
Document Number:	005442178-01	Contractor Reference Number:	PC2340-RHD-OF-ZZ-AX-Z-0120

Rev No.	Date	Status/Reason for Issue	Author	Checked by	Approved by
01	January 2025	Submission to accompany Project Change Request 1.	RHDHV	RWE	RWE

Contents

Glossary

Term	Definition
Array Areas	The DBS East and DBS West offshore Array Areas, where the wind turbines, offshore platforms and array cables would be located. The Array Areas do not include the Offshore Export Cable Corridor or the Inter-Platform Cable Corridor within which no wind turbines are proposed. Each area is referred to separately as an Array Area.
Array cables	Offshore cables which link the wind turbines to the Offshore Converter Platform(s).
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Project (NSIP).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the value, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
Electrical Switching Platform (ESP)	The Electrical Switching Platform (ESP), if required would be located either within one of the Array Areas (alongside an Offshore Converter Platform (OCP)) or the Export Cable Platform Search Area.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Statement (ES).
Fish and Shellfish Ecology Study Area	The Fish and Shellfish Ecology Study Area for the Projects is defined as International Council for the Exploration of the Sea (ICES) Rectangles 36E9; 36F0; 37E9; 37F0; 37F1; 37F2; 38F0; 38F1; and 38F2. It covers a total of 26,858km2, and includes the Offshore Development Area with a minimum buffer distance of 7km.
Impact	Used to describe a change resulting from an activity via the Projects, i.e. increased suspended sediments / increased noise.
In-Isolation Scenario	A potential construction scenario for one Project which includes either the DBS East or DBS West array, associated offshore and onshore cabling and only the eastern Onshore Converter Station within the Onshore Substation Zone and only the northern route of the onward cable route to the proposed Birkhill Wood National Grid Substation.

Term	Definition
Inter-Platform Cable Corridor	The area where Inter-Platform Cables would route between the DBS East and DBS West Array Areas, should both Projects be constructed.
Inter-Platform Cables	Buried offshore cables which link offshore platforms.
Offshore Converter Platforms (OCPs)	The OCPs are fixed structures located within the Array Areas that collect the AC power generated by the wind turbines and convert the power to DC, before transmission through the Offshore Export Cables to the Project's Onshore Grid Connection Points.
Offshore Development Area	The Offshore Development Area for ES encompasses both the DBS East and West Array Areas, the Inter-Platform Cable Corridor, the Offshore Export Cable Corridor, plus the associated Construction Buffer Zones.
Offshore Export Cable Corridor	This is the area which will contain the Offshore Export Cables (and potentially the ESP) between the Offshore Converter Platforms and Transition Joint Bays at the landfall.
Offshore Export Cables	The cables which would bring electricity from the offshore platforms to the Transition Joint Bays (TJBs).
Offshore platforms	Collective term which refers to all potential offshore platforms found within the Projects' Offshore Development Area (i.e. OCPs, CPs, ESP and Accommodation Platform).
Project Change Request 1	The proposed changes to the DCO application for the Projects set out in Project Change Request 1 - Offshore & Intertidal Works [document reference 10.49].
Projects Design (or Rochdale) Envelope	A concept that ensures the EIA is based on assessing the realistic worst case scenario where flexibility or a range of options is sought as part of the consent application.
Suspended sediment	The sediment moving in suspension in a fluid kept up by the upward components of the turbulent currents or by the colloidal suspension.
The Applicants	The Applicants for the Projects are RWE Renewables UK Dogger Bank South (East) Limited and RWE Renewables UK Dogger Bank South (West) Limited. The Applicants are themselves jointly owned by the RWE Group of companies (51% stake) and Masdar (49% stake).
The Projects	DBS East and DBS West (collectively referred to as the Dogger Bank South offshore wind farms).
Wind turbine	Power generating device that is driven by the kinetic energy of the wind.

Acronyms

Term	Definition
DBS	Dogger Bank South
DC	Direct Current
DCO	Development Consent Order
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
ES	Environmental Statement
ESP	Electrical Switching Platform
ExA	Examining Authority
GBS	Gravity Based Structure
ICES	International Council for the Exploration of the Sea
OCP	Offshore Converter Platforms
SSC	Suspended Sediment Concentrations
UXO	Unexploded Ordnance

1 Introduction

1. The Development Consent Order (DCO) application for the Dogger Bank South (DBS) East and DBS West Offshore Wind Farms (hereafter referred to as 'the Projects') was accepted by the Secretary of State for examination on 10th July 2024. RWE Renewables UK Dogger Bank South (East) Limited and RWE Renewables UK Dogger Bank South (West) Limited ('the Applicants') have been engaging with Interested Parties to resolve concerns or comments ahead of the examination commencing. This engagement, in combination with continuing design work, has resulted in the Applicants deciding to seek a small number of changes to their DCO application. The acceptability of any change is to be determined by the Examining Authority (ExA). The proposed changes taken alone or together would not materially change the nature of the Projects.

2. The proposed changes to the Projects' Design Envelope are as follows:

- Removal of Gravity Based Structure (GBS) foundations;
- Removal of the Electrical Switching Platform (ESP) within the Offshore Export Cable Corridor from the Projects' Design Envelope;
- Reduction in number of offshore platforms in the Projects' Design Envelope from eight to three within the Array Areas, including reductions of associated seabed preparation and scour protection;
- Reduction of cabling within the Array Areas, plus associated seabed preparation and cable protection; and
- Removal of the short trenchless crossing at landfall.

3. In addition, the site specific marine physical processes modelling has been updated to take into account the revised Projects' Design Envelope. This reflects the proposed reduction in number of offshore platforms discussed above and the removal of GBS foundations (which had been removed from the Projects' Design Envelope previously but had come too late for the modelling to be updated prior to the DCO application).

4. To aid the ExA in determining the acceptability of the proposed changes, a **Project Change Request 1 – Offshore and Intertidal Works** [document reference: 10.49] was submitted for consultation with key technical stakeholders to seek their views on the proposed changes. That report summarises all proposed changes to the assessments detailed in the Environmental Statement (ES) and the Report to Inform Appropriate Assessment.

5. The targeted non-statutory consultation period ran from the 15th November 2024 to the 16th December 2024, at which point all responses were reviewed by the Applicants with updates to the documents made as necessary (see section 5 of **Project Change Request 1 – Offshore and Intertidal Works** [document reference: 10.49], which details the stakeholder comments received and the Applicants' responses to each). No material changes to this appendix were required on receipt of stakeholder comments.

2 Purpose of this Document

6. This **Appendix A Fish and Shellfish Environmental Assessment Update** [document reference:10.50] has been produced to provide additional detail regarding the potential changes to the fish and shellfish ecology assessment summarised in the **Project Change Request 1 – Offshore and Intertidal Works** [document reference: 10.49].

7. The assessment originally undertaken in ES **Chapter 10 Fish and Shellfish Ecology** [APP-091] for impact pile driving to fish and shellfish was carried out for DBS East, DBS West and for the Offshore Export Cable Corridor. Following the removal of the ESP from the Projects' Design Envelope all impact piling would be removed from the Offshore Export Cable Corridor. In addition, the number of monopiles in each Array Area would be reduced from 104 to 102 due to the reduction in the number of platforms. If the Projects were constructed together the number of monopiles would be reduced from 208 to 203 (Table 3-4 in **Project Change Request 1 – Offshore and Intertidal Works** [document reference: 10.49]).

8. Therefore, this appendix provides an updated assessment based on the changes to the worst case construction parameters originally assessed within **Chapter 10 Fish and Shellfish Ecology** [APP-091] in relation to temporary habitat disturbance, increase in suspended sediments, release of sequestered contaminants, underwater noise and vibration, reduction in fishing pressure, permanent habitat loss, and Electromagnetic Fields (EMF). The methodology used within this appendix is detailed within the original ES chapter (**Chapter 10 Fish and Shellfish Ecology** [APP-091]), which should be read alongside this document to contextualise assessments made. Assessments made within this document therefore assume the decommissioning effects of the Projects to be comparable to, or less than, the construction phase.

9. Any construction or operational effects assessed in the original assessment that are not detailed above would not be affected by the proposed changes. As such the conclusions reached for those construction and operational effects would remain the same. They are therefore not considered further in this appendix.

10. For potential impacts from EMF effects arising from cables, cable lengths have been rectified to include Inter-Platform Cables which were omitted in error from the original assessment set out in **Chapter 10 Fish and Shellfish Ecology** [APP-091] and submitted with the DCO application. The assessment provided in section 3.2.3 now gives consideration to all cables associated with the Projects at lengths specified within Table 3-4 of **Project Change Request 1 – Offshore and Intertidal Works** [document reference: 10.49].

11. For the assessment of reduced fishing pressure within the Array Areas and increased fishing pressure outside of the Array Areas, values presented within the original assessment (**Chapter 10 Fish and Shellfish Ecology** [APP-091]) utilised values based on outdated, inflated infrastructure footprints. The footprints presented within this assessment present a corrected version of infrastructure footprint in line with values specified within Table 3-4 of **Project Change Request 1 – Offshore and Intertidal Works** [document reference: 10.49].

2.1 Realistic Worst Case Scenario

2.1.1 General Approach

12. The realistic worst case design parameters (Table 10-1 of **Chapter Fish and Shellfish** [APP-091]) for effects scoped into the ES for the fish and shellfish ecology assessment have been updated and are summarised in Table 3-4 of **Project Change Request 1 – Offshore and Intertidal Works** [document reference: 10.49].

13. In addition to the design parameters set out in Table 3-4 of **Project Change Request 1 – Offshore and Intertidal Works** [document reference: 10.49], consideration is also given to the different development scenarios still under consideration, and the possible phasing of the construction as set out in **Chapter 10 Fish and Shellfish Ecology** [APP-091].

3 Assessment of Significance

3.1 Potential Effects During Construction

3.1.1 Impact 1: Temporary Habitat Disturbance to Fish and Shellfish Species and Spawning and / or Nursery Grounds

3.1.1.1 Magnitude of Impact – DBS East or DBS West in Isolation

14. Due to the proposed changes, the worst case scenario footprint of temporary habitat disturbance and direct damage associated with the construction phase of DBS East would decrease from approximately 30.6km² to 29.5km². This represents approximately 0.11% of the Fish and Shellfish Ecology Study Area. The footprint for all generation asset construction works, including the array and Inter-Platform Cables, offshore platforms, and foundations, would decrease from 10.8km² to 9.7km² for DBS East. The footprint for the installation of the Offshore Export Cable would remain as 19.8km².

15. The worst case scenario footprint of temporary habitat disturbance and direct damage associated with the construction phase of DBS West would decrease from 28.1km² to 26.7km². This represents approximately 0.10% of the total Fish and Shellfish Ecology Study Area. The footprint for all generation asset construction works, including the array and Inter-Platform Cables, offshore platforms and foundations, would decrease from 11.1km² to 9.7km² for DBS West. The footprint for the installation of the Offshore Export Cable would remain as 17.0km².

16. Of the two Projects, DBS East represents the worst case scenario in isolation. The assessment of temporary habitat disturbance and direct damage in isolation therefore assumes this worst case scenario for both Projects.

17. These changes are not considered to result in a change in magnitude as determined within the ES and therefore, the magnitude of impact remains as low.

3.1.1.2 Magnitude of Impact – DBS East and DBS West Together

18. Due to the proposed changes, the worst case scenario footprint of temporary habitat disturbance and direct damage associated with the construction phase of the Projects would decrease from 62.4km² to 58.7km². This represents approximately 0.22% of the total Fish and Shellfish Ecology Study Area. The footprint for all generation asset construction works, including the array and Inter-Platform Cables, offshore platforms, and foundations, would decrease from 24.2km² to 21.9km². The footprint for all offshore transmission works, including the Offshore Export Cable installation, would decrease from 38.2km² to 36.8km².

19. Due to the small reduction in footprint, these changes are not considered to result in a change in magnitude as determined within the ES and therefore, the magnitude of impact remains as low.

3.1.1.3 Significance of Effect – DBS East or DBS West in Isolation

20. The low magnitude of impact for DBS East (as the worst case scenario footprint assigned to both DBS East and DBS West), combined with the low sensitivity for the elasmobranch receptor group, results in the assessment that temporary habitat disturbance and direct damage has a **minor adverse** effect, and is therefore not significant in Environmental Impact Assessment (EIA) terms.

21. The low magnitude of impact for DBS East (as the worst case scenario footprint assigned to both DBS East and DBS West), combined with the medium sensitivity for the demersal fish and pelagic fish receptor groups, results in the assessment that temporary habitat disturbance and direct damage has a **minor adverse** effect, and is therefore not significant in EIA terms.

22. The low magnitude of impact for DBS East (as the worst case scenario footprint assigned to both DBS East and DBS West), combined with the medium sensitivity for the shellfish receptor group, results in the assessment that temporary habitat disturbance and direct damage has a **minor adverse** effect, and is therefore not significant in EIA terms. No additional mitigation measures are required.

23. Based on the reduction in the worst case scenario footprint, the significance of effect for DBS East (as the worst case scenario footprint assigned to both DBS East and West) would not change as a result of the proposed changes to the Projects' Design Envelope and therefore would remain as **minor adverse**, as previously assessed in the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]).

3.1.1.4 Significance of Effect – DBS East and DBS West Together

24. The low magnitude of impact for both Projects together (DBS East and DBS West), combined with the low sensitivity for the elasmobranch receptor group, results in the assessment that temporary habitat disturbance and direct damage has a **minor adverse** effect, and is therefore not significant in EIA terms.

25. The low magnitude of impact for both Projects together (DBS East and DBS West), combined with the medium sensitivity for the demersal fish, pelagic fish, and shellfish receptor groups, results in the assessment that temporary habitat disturbance and direct damage has a **minor adverse** effect, and is therefore not significant in EIA terms. No additional mitigation measures are required.

26. Based on the reduction in the worst case scenario footprint for both Projects together (DBS East and DBS West), the significance of effect would not change as a result of the proposed changes to the Projects' Design Envelope and therefore would remain as **minor adverse**, as previously assessed in the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]).

3.1.2 Impact 2: Increase in Local Suspended Sediment Concentrations and Sediment Settlement

3.1.2.1 Magnitude of Impact – DBS East or DBS West in Isolation

27. Due to the proposed changes, the total worst case scenario volume of sediment with the potential to cause an increase in Suspended Sediment Concentrations (SSC) and sediment settlement associated with the construction phase of DBS East would decrease from 39,973,497m³ to 39,226,252m³. The worst case scenario volume of sediment with the potential to cause an increase in SSC and sediment settlement associated with the construction phase of DBS West would decrease from 35,664,569m³ to 35,407,351m³.

28. Of the two Projects, DBS East represents the worst case scenario in isolation. The assessment for an increase in SSC and sediment settlement in isolation, would therefore be assumed to be this worst case scenario for either Project.

29. These changes are not considered to result in a change in magnitude as determined within the ES and therefore, the magnitude of impact remains as low.

3.1.2.2 Magnitude of Impact – DBS East and DBS West Together

30. Due to the proposed changes, the worst case scenario volume of sediment with the potential to cause an increase in SSC and sediment settlement associated with the construction phase of the Projects would decrease from 76,618,434m³ to 75,153,734m³.

31. These changes are not considered to result in a change in magnitude as determined within the ES and therefore, the magnitude of impact remains as low.

3.1.2.3 Significance of Effect – DBS East or DBS West in Isolation

32. The low magnitude of impact for DBS East (as the worst case scenario footprint assigned to both DBS East and DBS West), combined with the negligible sensitivity for adult individuals within the elasmobranch, demersal fish, pelagic fish, and migratory fish receptor groups, results in the assessment that an increase in SSC and sediment settlement has a **negligible** effect, and is therefore not significant in EIA terms.

33. The low magnitude of impact for DBS East (as the worst case scenario footprint assigned to both DBS East and DBS West), combined with the medium sensitivity for eggs and / or larvae within the elasmobranch, demersal fish, pelagic fish, and migratory fish receptor groups, results in the assessment that an increase in SSC and sediment settlement has a **minor adverse** effect, and is therefore not significant in EIA terms.

34. The low magnitude of impact for DBS East (as the worst case scenario footprint assigned to both DBS East and DBS West), combined with the medium sensitivity for the shellfish receptor group, results in the assessment that an increase in SSC and sediment settlement has a **minor adverse** effect, and is therefore not significant in EIA terms. No additional mitigation measures are required.

35. Based on the reduction in the worst case scenario footprint, the significance of effect for DBS East (as the worst case scenario footprint assigned to both DBS East and West) would not change as a result of the proposed changes to the Projects' Design Envelope and therefore would remain as **negligible** to **minor adverse**, as previously assessed in the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]).

3.1.2.4 Significance of Effect – DBS East and DBS West Together

36. The low magnitude of impact for both Projects together (DBS East and DBS West), combined with the negligible sensitivity for adult individuals within the elasmobranch, demersal fish, pelagic fish, and migratory fish receptor groups, results in the assessment that an increase in SSC and sediment settlement has a **negligible** effect, and is therefore not significant in EIA terms.

37. The low magnitude of impact for both Projects together (DBS East and DBS West), combined with the medium sensitivity for eggs and / or larvae within the elasmobranch, demersal fish, pelagic fish, and migratory fish receptor groups, results in the assessment that an increase in SSC and sediment settlement has a **minor adverse** effect, and is therefore not significant in EIA terms.

38. The low magnitude of impact for both Projects together (DBS East and DBS West), combined with the medium sensitivity for the shellfish receptor group, results in the assessment that an increase in SSC and sediment settlement has a **minor adverse** effect, and is therefore not significant in EIA terms. No additional mitigation measures required.

39. Based on the reduction in the worst case scenario footprint for both Projects together (DBS East and DBS West), the significance of effect would not change as a result of the proposed changes to the Projects' Design Envelope and therefore would remain as **negligible** to **minor adverse**, as previously assessed in the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]).

3.1.3 Impact 3: Release of Sequestered Contaminants following Sediment Disturbance

3.1.3.1 Magnitude of Impact – DBS East or DBS West in Isolation

40. As described within section 10.6.1.2 of **Chapter 10 Fish and Shellfish Ecology** [APP-091], sediment modelling indicates plume extents of up to 5km from the Array Areas and up to 7km from the Offshore Export Cable Corridor. Excluding changes in sediment depth directly at the cable corridor, changes are not anticipated to exceed 0.03m. Sediment deposition depth associated with trenching within either of the Array Areas will typically be under 0.05m, and changes associated with seabed preparation for foundations will typically be under 0.005m. This modelling indicates the potential distances over which contaminants may be distributed as a result of construction works.

41. As discussed within **Chapter 8 Marine Physical Environment** [APP-080] fine sediments are more easily mobilised but concentrations within the region are low. They are expected to settle, with a return to baseline conditions likely within hours due to dispersion and dilution. The disturbance of sediments is therefore considered to be highly localised and short-term, with episodic rather than continuous disturbance.

42. The nature of sediments (sands and gravels with limited fines components) across the Offshore Development Area significantly reduces the potential for accumulation of contaminants. Therefore, the ES considered the potential levels of sequestered contaminants available for release to be low.

43. As detailed in section 3.1.2 of this appendix, the magnitude of increased local SSC would decrease with the updated parameters for the Projects, therefore, the potential levels of sequestered contaminants following sediment disturbance would also decrease. The proposed changes to the Projects' Design Envelope are not considered to result in a change in magnitude as determined within the ES and therefore, the magnitude of impact would remain as negligible.

3.1.3.2 Magnitude of Impact – DBS East and DBS West Together

44. Based on modelling of sediment suspension and studies of contaminant levels and sediment types across the Offshore Development Area, it is considered that both the level of suspended sediment release (expected to be localised, short-term, and episodic) and the levels of contaminants would be low. The proposed changes to the Projects' Design Envelope are not considered to result in a change in magnitude as determined within the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]) submitted with the DCO application and therefore, the magnitude of impact would remain as negligible.

3.1.3.3 Significance of Effect – DBS East or DBS West in Isolation

45. Based on the reduction in the worst case scenario footprint, the significance of effect for DBS East (as the worst case scenario footprint assigned to both DBS East and West) would not change as a result of the proposed changes to the Projects' Design Envelope and therefore, would remain as **negligible**, as previously assessed in the ES. No additional mitigation measures are required.

3.1.3.4 Significance of Effect – DBS East and DBS West Together

46. Based on the reduction in the worst case scenario footprint for both Projects together (DBS East and DBS West), the significance of effect would not change as a result of the proposed changes to the Projects' Design Envelope and therefore, would remain as **negligible**, as previously assessed in the ES. No additional mitigation measures are required.

3.1.4 Impact 4: Impacts on Fish and Shellfish Species as a Result of Underwater Noise and Vibration

3.1.4.1 Magnitude of Impact – DBS East or DBS West in Isolation

47. The updated Projects' Design Envelope due to the proposed changes, would reduce the worst case scenario from a total of 104 to 102 monopiles to be installed across the DBS West Array Area, with no more than four monopiles being installed on a single day. Modelling assumes each monopile would take up to 320 minutes of piling to install, with 250 minutes being at the full 6,000kJ. This totals 544 hours of piling spread across a period of no less than 26 days, which is fewer than the previously assessed total of 554.67 hours spread across a period of no less than 27 days.

48. For Unexploded Ordnance (UXO), the worst case scenario of two UXO clearance operations being required in a single day remains unchanged. Piling of monopiles within the Offshore Export Cable Corridor would be removed from the Projects' Design Envelope, and the number of monopiles required for offshore platforms would decrease from four to two. Therefore, the magnitude of impact for underwater noise and vibration remains as low, as previously concluded in the ES.

3.1.4.2 Magnitude of Impact – Export Cable Route Electrical Switching Platform

49. Due to the proposed changes piling along the Export Cable Corridor would no longer be included within parameters for the Projects, as there will be no ESP within the Projects' Design Envelope. Therefore, the magnitude of impact for underwater noise and vibration associated with piling along the Offshore Export Cable Corridor is not considered within the final assessment of significance of impacts associated with underwater noise and vibration.

3.1.4.3 Magnitude of Impact – DBS East and DBS West Together

50. Due to the proposed changes, the worst case scenario for total pin piles to be installed across the DBS West and DBS East Array Area would be reduced from 864 to 824, with no more than eight pin piles being installed in a single day[1].

51. When considering the impact of simultaneous pin piling events, the total number of pin piles to be installed would decrease from 864 across the Array Areas and Offshore Export Cable Corridor to 824 across the Array Areas only, with no more than eight piles being installed on a single day. Pin piling would no longer take place within the Offshore Export Cable Corridor. Modelling assumes each pile would take up to 190 minutes of piling to install, with 120 minutes being at the full 3,000kJ. This totals a piling time of 2,609.3 hours, which is fewer than the 2,736 hours required for the previous Projects' Design Envelope.

52. No pin piling would be undertaken in association with the ESP, and therefore any potential overlap with potential Atlantic herring spawning habitat at this location would be considered limited to within the area indicated within Figure 10-8 of **Chapter 10 Fish and Shellfish Ecology Figures** [APP-092], showing extent of concurrent monopiling at both Array Areas.

53. The determination of magnitude for UXO clearance and non-impulsive noise remains the same for both construction scenarios.

54. With consideration to the removal of piling within the Offshore Export Cable Corridor at the ESP location and the reduction in the number of pin piles to be used across the Array Areas, the magnitude of impact for underwater noise and vibration would remain as low, as previously concluded in the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]) submitted with the DCO application.

3.1.4.4 Significance of Effect – DBS East or DBS West in Isolation

55. The low magnitude of impact for DBS West (or DBS East), combined with the medium sensitivity for fish and shellfish with a swim bladder used in hearing, results in the assessment that impacts associated with noise and vibration have a **minor adverse** effect, and is therefore not significant in EIA terms.

56. All other fish and shellfish receptor groups present low sensitivity of effect, which combined with low magnitude of impact, results in the assessment that impacts associated with noise and vibration have a **minor adverse** effect, and is therefore not significant in EIA terms. No additional mitigation measures are required.

[1] The version of this report previously issued for consultation in late 2024 stated that no more than 12 pin piles would be installed in a single day. This was an error, with the proposed changes resulting in no more than eight pin piles being installed in a single day. The calculations regarding total piling time and total number of piles to be installed remain identical to that previously consulted on.

57. Based on the reduction in the worst case scenario parameters, the significance of effect for DBS West (as the worst case scenario footprint assigned to both DBS East and West) would not change as a result of the proposed changes to the Projects' Design Envelope and therefore, would remain as **minor adverse** as previously assessed in the ES.

3.1.4.5 Significance of Effect – DBS East and DBS West Together

58. The low magnitude of impact for both Projects together (DBS East and DBS West), and the medium sensitivity for fish and shellfish with a swim bladder used in hearing, would result in the assessment that impacts associated with noise and vibration have a **minor adverse** effect, and is therefore not significant in EIA terms.

59. All other fish and shellfish receptor groups present low sensitivity of effect, which combined with low magnitude of impact, results in the assessment that impacts associated with noise and vibration have a **minor adverse** effect, and is therefore not significant in EIA terms. No additional mitigation measures are required.

60. Based on the reduction in the worst case scenario parameters for both Projects together (DBS East and DBS West), the significance of effect would not change as a result of the proposed changes to the Projects' Design Envelope and therefore, would remain as **minor adverse**, as previously assessed in the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]).

3.2 Potential Effects During Operation

3.2.1 Impact 5: Effect on Fish Stocks of Reduced Fishing Pressure Within the Array Areas and Increased Fishing Pressure Outside of the Array Area.

3.2.1.1 Magnitude of Impact – DBS East or DBS West in Isolation

61. For the assessment of reduced fishing pressure within the Array Areas and increased fishing pressure outside of the Array Areas, values presented within the original assessment (**Chapter 10 Fish and Shellfish Ecology** [APP-091]) utilised values based on outdated and inflated infrastructure footprints. The outdated values presented within **Chapter 10 Fish and Shellfish Ecology** [APP-091] are discussed below for consistency, however the values that should have been presented are provided in brackets to contextualise the actual scale of change.

62. The total footprint of infrastructure within the Array Area for DBS East is revised from 3.72km² (0.89km²) to 0.74km², and from 1.21km² (1.2km²) to 1.10km² for the Offshore Export Cable Corridor (worst case values). The total footprint of infrastructure within the Array Area for DBS West is revised from 3.87km² (0.9km²) to 0.74km², and from 1.93km² (1.0km²) to 0.94km² for the Offshore Export Cable Corridor (worst case values). Of the two Projects, DBS East represents the worst case scenario in isolation.

63. The impact is not anticipated to result in any effect, with no change noticeable from natural variation. Therefore, the magnitude of impact is considered negligible.

3.2.1.2 Magnitude of Impact – DBS East and DBS West Together

64. Total footprint of infrastructure within the Array Area for both Projects together (DBS East and DBS West) is revised from 8.28km² (2.05km²) to 1.7km², and from 3.14km² (2.1km²) to 2.08km² for the Offshore Export Cable Corridor (worst case values). The impact is not anticipated to cause noticeable changes identifiable from natural variation. Therefore, the magnitude of impact is considered negligible.

3.2.1.3 Significance of Effect – DBS East or DBS West in Isolation

65. The negligible magnitude of impact for DBS East and DBS West in isolation, combined with the negligible sensitivity for all fish and shellfish receptor groups, results in the assessment that reduced fishing pressure within the Array Areas, and increased fishing pressure outside of the Array Area has a **negligible** effect, and is therefore not significant in EIA terms. No additional mitigation measures are required. Based on the reduction in the worst case scenario parameters for a Projects in isolation, there would be no change in effect from what was previously assessed.

3.2.1.4 Significance of Effect – DBS East and DBS West Together

66. The negligible beneficial magnitude of impact for the Projects (DBS East and DBS West), combined with the negligible sensitivity for all fish and shellfish receptor groups, results in the assessment that reduced fishing pressure within the Array Areas and increased fishing pressure outside of the Array Area has a **negligible** effect, and is therefore not significant in EIA terms. No additional mitigation measures are required. Based on the reduction in the worst case scenario parameters for both Projects together (DBS East and DBS West), there would be no change in effect from what was previously assessed.

3.2.2 Impact 6: Permanent Loss of Habitat and / or Change in Habitat Type as a Result of Changes in Substrate Composition

3.2.2.1 Magnitude of Impact – DBS East or DBS West in Isolation

67. Due to the proposed changes, the worst case scenario for permanent loss of habitat and / or change in habitat type as a result of changes in substrate composition associated with the operational phase of DBS East would decrease from 2.09km² to 1.88km². This represents approximately 0.007% of the total Fish and Shellfish Ecology Study Area. This is the worst case habitat loss for the total Array Area, which would decrease from 0.89km² to 0.74km², and the total Offshore Export Cable Corridor, which would decrease from 1.20km² to 1.14km². This value includes all seabed infrastructure including foundations, scour protection, cable protection, and cable and pipeline crossings that would result in a change from pre-construction seabed composition.

68. The worst case scenario for permanent loss of habitat and / or change in habitat type as a result of changes in substrate composition associated with the operational phase of DBS West would decrease from 1.91km² to 1.68km². This represents approximately 0.006% of the total Fish and Shellfish Ecology Study Area. This is the worst case habitat loss for the total Array Area, which would decrease from 0.92km² to 0.74km, and the total Offshore Export Cable Corridor, which would decrease from 0.99km² to 0.94km². This value includes all seabed infrastructure including foundations, scour protection, cable protection, and cable and pipeline crossings that would result in a change from pre-construction seabed composition.

69. Of the two Projects, DBS East represents the worst case scenario in isolation. The assessment of permanent loss of habitat and / or change in habitat type as a result of changes in substrate composition, would therefore assume this worst case scenario for either Project.

70. These changes are not considered to result in a change in magnitude as determined within the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]) and therefore, the magnitude of impact would remain as low.

3.2.2.2 Magnitude of Impact – DBS East and DBS West Together

71. Due to the proposed changes, the worst case scenario for permanent loss of habitat and / or change in habitat type as a result of changes in substrate composition associated with the operational phase of both Projects would decrease from 4.19km² to 3.79km². This represents approximately 0.014% of the total Fish and Shellfish Ecology Study Area. This is the worst case habitat loss for the total Array Areas, which would decrease from 2.05km² to 1.71km², and the total Offshore Export Cable Corridor, which would decrease from 2.14km² to 2.08km².

72. These changes are not considered to result in a change in magnitude as determined within the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]) and therefore, the magnitude of impact remains as low.

3.2.2.3 Significance of Effect – DBS East or DBS West in Isolation

73. The low magnitude of impact for DBS East (as the worst case scenario footprint assigned to both DBS East and DBS West), combined with the low sensitivity for the elasmobranch receptor group, results in the assessment that permanent loss of habitat and / or change in habitat type as a result of changes in substrate has a **minor** effect, and is therefore not significant in EIA terms.

74. The low magnitude of impact for DBS East (as the worst case scenario footprint assigned to both DBS East and DBS West, as well as the worst case for sandeel and Atlantic herring spawning), combined with the medium sensitivity for the demersal fish, and pelagic fish receptor groups with demersal spawning, results in the assessment that permanent loss of habitat and / or change in habitat type as a result of changes in substrate has a **minor adverse** effect, and is therefore not significant in EIA terms.

75. The low magnitude of impact for DBS East (as the worst case scenario footprint assigned to both DBS East and DBS West), combined with the medium sensitivity for the shellfish receptor group, results in the assessment that permanent loss of habitat and / or change in habitat type as a result of changes in substrate has a **minor adverse** effect, and is therefore not significant in EIA terms. No additional mitigation measures are required.

76. Based on the reduction in the worst case scenario footprint, the significance of effect for DBS East (as the worst case scenario footprint assigned to both DBS East and West) would not change as a result of the proposed changes to the Projects' Design Envelope and therefore would remain as **minor adverse**, as previously assessed in the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]).

3.2.2.4 Significance of Effect – DBS East and DBS West Together

77. The low magnitude of impact for both Projects (DBS East and DBS West), combined with the low sensitivity for the elasmobranch receptor group, results in the assessment that permanent loss of habitat and / or change in habitat type as a result of changes in substrate has a minor effect, and is therefore not significant in EIA terms.

78. The low magnitude of impact for both Projects (DBS East and DBS West), combined with the medium sensitivity for the demersal fish, and pelagic fish receptor groups with demersal spawning, results in the assessment that permanent loss of habitat and / or change in habitat type as a result of changes in substrate has a **minor adverse** effect, and is therefore not significant in EIA terms.

79. The low magnitude of impact for both Projects (DBS East and DBS West), combined with the medium sensitivity for the shellfish receptor group, results in the assessment that permanent loss of habitat and / or change in habitat type as a result of changes in substrate has a **minor adverse** effect, and is therefore not significant in EIA terms. No additional mitigation measures are required.

80. Based on the reduction in the worst case scenario footprint for both Projects together (DBS East and DBS West), the significance of effect would not change as a result of the proposed changes to the Projects' Design Envelope and therefore would remain as **minor adverse**, as previously assessed in the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]).

3.2.3 Impact 7: EMF Effects Arising From Cables

81. A small increase (25km) in array cable length is required due to array cable layout constraints leading to a re-evaluation of lengths included at submission, in combination with the addition of the Inter-Platform Cable length which was omitted in error from the assessment undertaken in the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]).

82. The worst case cable length for Inter-Platform Cables for the original ES submission was 115km for DBS East in isolation, 129km for DBS West in isolation and 342km for both Projects together. There are increased lengths of Inter-Platform Cables for both Projects together due to the requirement of connecting platforms across both Projects which is not needed for the In-Isolation Scenarios.

83. This additional cabling means the total length of all cabling (Offshore Export Cable, array cable and Inter-Platform Cable) for DBS East in isolation was 816km, 760km for DBS West in isolation and 1,674km for both Projects together. However, the additional length of the inter-platform cabling would not have changed the conclusion of the assessment undertaken in the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]). The significance of effect would have remained **negligible** to **minor adverse**.

3.2.3.1 Magnitude of Impact – DBS East or DBS West in Isolation

84. Due to the proposed changes, the worst case scenario for cable properties with the potential to cause EMF effects during the operational phase of DBS East would decrease from 816km to 749km of cable length, with a minimum burial depth of 0.5m. The worst case for Offshore Export Cables is 376km of cable (two cables of 188km length), with a maximum voltage of 525kV direct current (DC). The worst case for array cables would increase from 325km to 350km cable length with a maximum voltage of 132kV. The worst case for Inter-Platform Cables would reduce from 115km to 23km, with a maximum voltage of 275kV.

85. The worst case scenario for cable properties with the potential to cause EMF effects during the operational phase of DBS West would decrease from 760km to 679km of cable length, with a minimum burial depth of 0.5m. The worst case for Offshore Export Cables is 306km of cable (two cables of 153km length) with a maximum voltage of 525kV DC. The worst case for array cables would increase from 325km to 350km cable length with a maximum voltage of 132kV. The worst case for Inter-Platform Cables would reduce from 129km to 23km, with a maximum voltage of 275kV.

86. Of the two Projects, DBS East represents the worst case scenario in isolation with a total cable length of 749km. The assessment of EMF effects arising from cables during the operational phase would therefore assume this worst case scenario.

87. Based on the cable properties for DBS East, the worst case volume of water containing detectable EMF from buried (0.5m) array cables and Inter-Platform Cables is revised from 10.65km^3 to 8.55km^3. This represents 0.07% (revised from 0.09%) of the water volume within the DBS East Array Area (11,521.85km³).

88. The worst case volume of water in the water column containing identifiable EMF from buried Offshore Export Cables associated with DBS East is 8.62km³. This represents 2.50% of the local water column volume associated with the Offshore Export Cable Corridor (344.7km³).

89. The total worst case volume of water containing identifiable EMF associated with DBS East cables is revised from 19.27km³ to 17.16km³. This represents 0.14% (revised from 0.16%) of the local water column volume associated with the footprint of the DBS East array cables and Offshore Export Cables (11,866.60km³). These changes are not considered to result in a change in magnitude as determined within the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]) and therefore, the magnitude of impact remains as negligible.

3.2.3.2 Magnitude of Impact – DBS East and DBS West Together

90. Due to the proposed changes, the worst case scenario for cable properties with the potential to cause EMF effects during the operational phase of both Projects together (DBS East and DBS West) would decrease from 1,674km to 1,543km of all cable with a minimum burial depth of 0.5m. The worst case for Offshore Export Cables is 682km of cable length, with a maximum voltage of 525kV DC. The worst case for array cables would increase from 650km to 700km cable length, with a maximum voltage of 132kV. The worst case for Inter-Platform Cables would reduce from 342km to 161km, with a maximum voltage of 275kV.

91. Based on the cable properties for both Projects combined (DBS East and DBS West), the worst case volume of water containing detectible EMF from buried (0.5m) array cables and Inter-Platform Cables is revised from 23.88km³ to 19.73km³. This represents 0.06% (revised from 0.09%) of the local water column volume associated with the array cables of both Projects combined (25,516.2km³).

92. The worst case volume of water in the water column containing identifiable EMF from buried Offshore Export Cables is 15.63km³. This represents 2.50% of the water column volume associated with the Offshore Export Cables of both Projects combined (12,516.5km³).

93. The total worst case volume of EMF for all cables is revised from 39.50km³ to 35.35km³. This represents 0.14% (revised from 0.15%) of the water column volume containing detectable EMF associated with the array cables and Offshore Export Cables of both Projects combined (26,141.87km³). These changes are not considered to result in a change in magnitude as determined within the ES and therefore, the magnitude of impact remains as negligible.

3.2.3.3 Significance of Effect – DBS East or DBS West in Isolation

94. The negligible adverse magnitude of impact for DBS East (as the worst case scenario assigned to both DBS East and DBS West), combined with the medium sensitivity for the elasmobranch receptor group, results in the assessment that EMF effects arising from cables during the operational phase have a **minor adverse** effect, and are therefore not significant in EIA terms.

95. The negligible adverse magnitude of impact for DBS East (as the worst case scenario assigned to both DBS East and DBS West), combined with the low sensitivity for the demersal, pelagic, and migratory fish species receptor group, results in the assessment that EMF effects arising from cables during the operational phase have a **negligible** effect, and are therefore not significant in EIA terms.

96. The negligible adverse magnitude of impact for DBS East (as the worst case scenario assigned to both DBS East and DBS West), combined with the negligible sensitivity for the shellfish species receptor group, results in the assessment that EMF effects arising from cables during the operational phase have a **negligible** effect, and are therefore not significant in EIA terms. No additional mitigation measures are required.

97. Based on the reduction in the worst case scenario footprint, the significance of effect for DBS East (as the worst case scenario footprint assigned to both DBS East and West) would not change as a result of the changes to the Projects' Design Envelope and therefore would remain as **negligible** to **minor adverse**, as previously assessed in the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]).

3.2.3.4 Significance of Effect – DBS East and DBS West Together

98. The negligible adverse magnitude of impact for both Projects together, combined with the medium sensitivity for the elasmobranch receptor group, results in the assessment that EMF effects arising from cables during the operational phase have a **minor adverse** effect, and are therefore not significant in EIA terms.

99. The negligible adverse magnitude of impact for both Projects together, combined with the low sensitivity for the demersal, pelagic, and migratory fish species receptor group, results in the assessment that EMF effects arising from cables during the operational phase have a **negligible** effect, and are therefore not significant in EIA terms.

100. The negligible adverse magnitude of impact for both Projects together, combined with the negligible sensitivity for the shellfish species receptor group, results in the assessment that EMF effects arising from cables during the operational phase have a **negligible** effect, and are therefore not significant in EIA terms. No additional mitigation measures are required.

101. Based on the reduction in the worst case scenario footprint for both Projects together (DBS East and DBS West), the significance of effect would not change as a result of the changes to the Projects' Design Envelope and therefore would remain as **negligible** to **minor adverse**, as previously assessed in the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]).

4 Summary

102. The proposed changes to the Projects' Design Envelope, presented above, in relation to Fish and Shellfish Ecology do not result in any changes to the significance of effect as determined within **Chapter 10 Fish and Shellfish Ecology** [APP-091] of the original ES.

RWE Renewables UK Dogger Bank
South (West) Limited

RWE Renewables UK Dogger Bank
South (East) Limited

Windmill Business Park
Whitehill Way
Swindon
Wiltshire, SN5 6PB