NORTH FALLS

Offshore Wind Farm

ENVIRONMENTAL STATEMENT

Appendix 12.6 Marine Mammal Cumulative Effect Assessment Screening

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Glossary of Acronyms

CGNS	Celtic and Greater North Seas
CEA	Cumulative Effect Assessment
DCO	Development Consent Order
EIA	Environmental Impact Assessment
FCS	Favourable Conservation Status
GS	Grey Seal
HP	Harbour Porpoise
HRA	Habitats Regulation Assessment
HS	Harbour Seal
iPCoD	Interim Population Consequences of Disturbance
JNCC	Joint Nature Conservation Committee
km	Kilometre
m	Metre
MBES	Multibeam Echo Sounder
MMO	Marine Management Organisation
MNR	Marine Noise Registry
MU	Management Unit
MW	Minke Whale
NE	North-East
NS	North Sea
OWF	Offshore Wind Farm
O&M	Operation and Maintenance
PTS	Permanent Threshold Shift
SAC	Special Area of Conservation
SBP	Sub-Bottom Profilers
SE	South-East
SSS	Side Scan Sonar
TTS	Temporary Threshold Shift
UK	United Kingdom
USBL	Ultra-Short Baseline
UXO	Unexploded Ordnance

Glossary of Terminology

Array area	The offshore wind farm area, within which the wind turbine generators, array cables, platform interconnector cable, offshore substation platform(s) and / or offshore converter platform will be located.
Array cables	Cables which link the wind turbine generators with each other, the offshore substation platform(s) and / or the offshore converter platform.
Landfall	The location where the offshore cables come ashore at Kirby Brook.
Offshore cable corridor	The corridor of seabed from array area to the landfall within which the offshore export cables will be located.

Offshore converter platform	Should an offshore connection to an HVDC interconnector cable be selected, an offshore converter platform would be required. This is a fixed structure located within the array area, containing HVAC and HVDC electrical equipment to aggregate the power from the wind turbine generators, increase the voltage to a more suitable level for export and convert the HVAC power generated by the wind turbine generators into HVDC power for export to shore via a third party HVDC interconnector cable.
Offshore export cables	The cables which bring electricity from the offshore substation platform(s) to the landfall, as well as auxiliary cables.
Offshore project area	The overall area of the array area and the offshore cable corridor.
Offshore substation platform(s)	Fixed structure(s) located within the array area, containing HVAC electrical equipment to aggregate the power from the wind turbine generators and increase the voltage to a more suitable level for export to shore via offshore export cables.
Platform interconnector cable	Cable connecting the offshore substation platforms (OSP); or the OSP and offshore converter platform (OCP).
The Applicant	North Falls Offshore Wind Farm Limited (NFOW).
The Project Or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.
Wind turbine generator	Power generating device that is driven by the kinetic energy of the wind.

1 Marine Mammal Cumulative Effect Assessment Screening

1.1 Introduction

1. The cumulative effects of the North Falls wind farm site have been addressed in the main chapter of the Environmental Statement. This Appendix summarises the results of the Cumulative Effect Assessment (CEA) screening and outlines the cumulative effects of North Falls as well as other plans and projects which have been screened into the marine mammals CEA. Parameters for inclusion of plans and projects were:

   - Projects and plans within the agreed reference population boundary for the given receptor:
     - Harbour porpoise (HP) *Phocoena phocoena*: North Sea (NS) Management Unit (MU);
     - Minke whale (MW) *Balaenoptera acutorostrata*: Celtic and Greater North Sea (CGNS) MU;
     - Grey seal (GS) *Halichoerus grypus*: South-east (SE) England and North-east (NE) England MUs; and
     - Harbour seal (HS) *Phoca vitulina*: South-east England MU.
   - Projects and plans with the potential to cause the type of effect which could have a cumulative effect with North Falls.
   - Projects and plans from an assessment Tier which was screened into the assessment.

2. Information and maps of the relevant MU areas are provided in ES Appendix 12.2 (Document Reference: 3.3.7).

3. Note that, due to the large size of the minke whale MU, projects and plans were considered only if they are located within the NS MU or Greater North Sea area, in order to provide a more realistic while still precautionary list of projects that may have an impact on the same population as North Falls.

4. For this assessment, the Tiers used for assessment are based on guidance issued by the Department for Environmental, Food & Rural Affairs (Defra) and Natural England in March 2022, and are as follows:

   - Tier 1: built and operational projects;
   - Tier 2: projects under construction;
   - Tier 3: projects that have been consented (but construction has not yet commenced);
   - Tier 4: projects that have an application submitted to the appropriate regulatory body that have not yet been determined;
   - Tier 5: projects that have produced a PEIR and have characterisation data within the public domain;

- Tier 6: projects that the regulatory body are expecting to be submitted for determination (e.g., projects listed under the Planning Inspectorate programme of projects); and
- Tier 7: projects that have been identified in relevant strategic plans or programmes.

5. These Tiers are used as they are more appropriate to use compared to the Tiers in The Planning Inspectorate (2019) Advice Note 17 for the types of projects and plans considered in this assessment, in particular for the offshore wind farm (OWF) stages.

6. Any plans or projects that have the potential for a construction / commissioning cumulative effect that commenced construction / commissioning (Tier 1 or 2) between the end of the baseline surveys in February 2021 and finalisation of the ES in Q1 2024 will not be taken forward in the CEA for this type of cumulative impact. It is assumed that construction / commissioning of those projects would be completed before the start of construction of North Falls.

7. All Tier 1 projects are considered to be part of the existing baseline environment if operational prior to the start of the baseline surveys for North Falls in March 2019.

8. The first stage of the screening is based on the widest possible range of offshore construction dates for North Falls, of between 2027 and 2031, based on the earliest possible offshore construction in 2027, planned operational date of 2031. However it should be noted that only a two-year offshore construction window is expected.

1.2 Data sources

9. A wide range of data sources and information was used for the CEA and CEA screening, including, but not limited to:

- North Falls (PEIR);
- Developer websites;
- 4C Offshore Winds Database (http://www.4coffshore.com/offshorewind/);
- Renewable United Kingdom (UK) website (http://www.renewableuk.com);
- The Crown Estate website;
- Oil and gas UK licensing rounds website (https://www.gov.uk/guidance/oil-and-gas-licensing-rounds#past-licensing-rounds);
- Oil and gas environmental submissions and determinations (https://www.gov.uk/guidance/oil-and-gas-environmental-data);
- Cefas website (e.g., http://data.cefas.co.uk/#/View/407);
- Planning Inspectorate National Infrastructure Planning website;
- The Marine Management Organisation (MMO) public register; and
- European Marine Observation and Data Network (EMODnet) data.

1.3 Identification of potential cumulative effects

10. The first step in the CEA is the identification of the impacts assessed for North Falls that have the potential for a cumulative effect with other plans, projects and activities (described as 'effect screening'). Only potential effects assessed as greater than negligible are considered in the CEA (i.e., those assessed as 'negligible' are not taken forward as there is no potential for them to contribute to a cumulative effect).

11. Initially the potential for cumulative effects were considered for:

- The risk of permanent change in hearing sensitivity (Permanent Threshold Shift (PTS)) from underwater noise;
- The risk of temporary change in hearing sensitivity (Temporary Threshold Shift (TTS)) from underwater noise;
- Disturbance from underwater noise;
- Barrier effects due to OWFs;
- Vessel collision risk;
- Disturbance at seal haul-out sites;
- Changes to water quality; and
- Changes to prey availability.

1.3.1 Permanent auditory injury due to underwater noise

12. PTS could occur as a result of pile driving during OWF installation, pile driving during oil and gas platform installation, underwater explosives (used occasionally during the removal of underwater structures and unexploded ordnance (UXO) clearance) and seismic surveys (Joint Nature Conservation Committee (JNCC), 2010a, 2010b). However, if there is the potential for any PTS, from any project, suitable mitigation would be put in place to reduce any risk to marine mammals. Other activities such as dredging, drilling, rock placement, vessel activity, operational OWFs, oil and gas installations or wave and tidal sites will emit broadband noise in lower frequencies and PTS from these activities is very unlikely.

13. Therefore, the potential risk of PTS in marine mammals from cumulative effects has been **screened out** from further consideration in the CEA.

1.3.2 Temporary auditory injury and disturbance from underwater noise

14. Disturbance is likely to have greater effect ranges and areas than TTS, and the risk of TTS will be within disturbance ranges for marine mammals. The effects of either TTS or disturbance in marine mammals are temporary. Where there is little information on the potential disturbance ranges for marine mammals, TTS has been used to indicate possible fleeing response.

15. Therefore, while the potential risk of TTS in marine mammals from cumulative effects has been **screened out** in its own right, the potential for TTS / fleeing

response will be considered alongside that of disturbance from underwater noise, where there is insufficient information on disturbance. The worst-case potential for the temporary effect (either TTS or disturbance) will be used to the inform the cumulative assessment for disturbance.

16. The potential for disturbance to marine mammals from underwater noise has been **screened in** to the CEA. As noted above, where there are no known disturbance ranges for a particular effect or marine mammal species, the potential for TTS has been considered.

1.3.3 Barrier effects due to disturbance from offshore wind

17. The potential for a barrier effect to marine mammals, due to the cumulative underwater noise of multiple OWFs, has been **screened in** to the CEA.

1.3.4 Vessel collision risk

18. The potential for an increase in vessel collision risk, due to an increase in vessels across cumulative projects, has been **screened in** to the CEA.

1.3.5 Disturbance at seal haul-out sites

19. The potential for disturbance at seal haul-out sites has been **screened in** to the CEA.

1.3.6 Changes to water quality

20. No significant effects with regard to water quality are expected as a result of North Falls (Section 12.5.1.7 of ES Chapter 12 Marine Mammals (Document Reference: 3.1.14)).

21. Aggregate and dredging projects have the potential for increased sediment suspension (and therefore impacts to marine mammal species), however any changes to water quality as a result of aggregate extraction and dredging would be very localised and temporary. Therefore, no potential for cumulative effect on marine mammal populations as a result of changes to water quality.

22. Therefore, changes to water quality (including from aggregate extraction and dredging) have been **screened out** from further consideration in the CEA.

1.3.7 Changes to prey availability

23. The potential for changes to prey availability has been **screened in** to the CEA.

1.4 Stages of plans and projects considered in the CEA

24. The second step in the CEA screening is the identification of the plans and projects that may result in cumulative effects for inclusion in the CEA (described as ‘project screening’).

25. The types of plans and projects included in the CEA, and the approach to screening, are based on the current stage of the plan or project within the planning and development process, stages are grouped into tiers as seen in

Table 1.1. This approach allows for the different levels of 'uncertainty' to be taken into account in the CEA, as well as the quality of the data available (as outlined in Section 12.8 of ES Chapter 12 Marine Mammals (Document Reference: 3.1.14)).

26. As noted above, the screening of these projects will be updated prior to submission of the Development Consent Order (DCO) Application, and therefore the projects included within the final CEA screening lists are likely to be different than those presented at this stage, based on the currently available information.

Table 1.1 Tier descriptions for use within the CEA

Tier	Tier description
Tier 1 projects	Built and operational projects should be included within the cumulative assessment where they have not been included within the environmental characterisation survey, i.e. they were not operational when baseline surveys were undertaken, and / or any residual impact may not have yet fed through to and been captured in estimates of "baseline" conditions, such as "background" distribution or mortality rate for birds. *
Tier 2 projects	Tier 1 + projects under construction
Tier 3 projects	Tier 2 + projects that have been consented (but construction has not yet commenced).
Tier 4 projects	Tier 3 + projects that have an application submitted to the appropriate regulatory body that have not yet been determined.
Tier 5 projects	Tier 4 + projects that have produced a PEIR and have characterisation data within the public domain
Tier 6 projects	Tier 5 + projects that the regulatory body are expecting an application to be submitted for determination (e.g., projects listed under the Planning Inspectorate programme of projects).
Tier 7 projects	Tier 6 + projects that have been identified in relevant strategic plans or programmes

*Or if there are ongoing impacts that are greater than predicted where there is no evidence that the impacts will dissipate over the lifetime of the Project, e.g., displacement of red-throated diver

1.5 Results of CEA screening

27. The types of plans, projects and activities initially considered in this CEA screening are:

- Other OWFs
  - Construction: (i) piling and (ii) other construction activities, including vessel presence
  - Operation and maintenance (O&M) phase, including vessel presence
  - Decommissioning phase
- Marine renewable (wave and tidal) developments
- Geophysical surveys (such as those associated with OWFs)
- Oil and gas installations
  - Construction

- Operation
- Decommissioning

- Oil and gas seismic surveys
- Aggregate extraction and dredging
- Licenced disposal sites
- Subsea cables and pipelines
- UXO clearance
- Other industries - gas storage, offshore mines, and carbon capture projects
- Coastal developments, such as ports and harbours
- Shipping
- Commercial fisheries

1.5.1 OWFs

1.5.1.1 Construction of OWFs

1.5.1.1.1 UK OWF long list

28. UK based projects listed in Tiers 1-4 were considered for potential construction cumulative effects, if the construction phases could overlap with the proposed construction of North Falls, and sufficient information and certainty in project programmes allowed for a meaningful assessment. In addition, Tier 5 and 6 projects for which the applications are currently in preparation have also been considered.

29. Where possible, known dates of OWF construction are used to assess whether there is the potential for construction periods to overlap with North Falls. For UK Tier 4 projects (application submitted) the possible construction windows were based on the best available information.

30. The initial screening process resulted in a list of 89 UK OWF projects within the relevant screening areas for harbour porpoise, minke whale, grey seal and harbour seal.

31. OWFs were considered part of the baseline if they were operational (Tier 1) at the time of the start of the North Falls site specific surveys (March 2019). There were 24 Tier 1 UK OWF projects screened out at this stage, as they were operational prior to the start of the North Falls surveys. The remaining five Tier 1 projects were also screened out on the basis of there being no overlap in construction programmes with North Falls.

32. Out of the 28 Tier 2-4 UK OWF projects, 19 do not have potential for the construction phase to overlap with construction of North Falls (2027-2031) and were therefore screened out. The remaining ten UK Tier 1-4 OWF projects have the potential for the construction phase to overlap with construction of North Falls (2027-2031):

- For all marine mammal species:

- Dudgeon extension;
- East Anglia Hub (East Anglia ONE North);
- Hornsea Project Three;
- Hornsea Project Four;
- Norfolk Vanguard; and
- Sheringham Shoal Extension.

- For harbour porpoise and minke whale only:
  - Berwick Bank;
  - Rampion 2; and
  - West of Orkney.

33. There are three Tier 5 UK OWF projects; all of which have been identified to have an overlapping time period with that of North Falls, and have therefore been screened in;

- For all marine mammal species:
  - Dogger Bank South (East and West);
  - Five Estuaries Offshore Wind Farm (herein 'Five Estuaries'); and
  - Outer Dowsing.

34. Of the 29 Tier 6 UK OWF projects, 14 projects had insufficient information available to determine if there is the potential for the construction phase to overlap with construction of North Falls (2027-2031) and were therefore screened out.

35. While there is some information available on the construction programmes for the remaining 15 Tier 6 UK OWF projects, they are all at an early stage of their planning and consenting process, and therefore there is a high level of uncertainty on (a) their construction programmes and project designs and (b) their potential for effect to marine mammal populations. All Tier 6 OWFs have therefore been screened out of further assessment.

36. There were no Tier 7 projects identified.

37. The results of this initial screening are presented in Table 1.2.

Table 1.2 Initial CEA screening for UK OWF projects within the relevant spatial area for each species and potential to overlap with North Falls construction (2027-2031) [HP = harbour porpoise, MW = minke whale, GS = grey seal, HS = harbour seal, Y = Yes, N = No]

Project	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
		HP	MW	HS	GS	Date operational	Construction Phase	Foundation piling period		
North Falls	***5***	***Y***	***Y***	***N***	***N***	***2031***	***2027 - 2031***	***2030-2031***	***n/a***	***N***
Aberdeen (EOWDC)	1	Y	Y	N	N	Jul-18	2017-2018	-	N	N
Arven	6	Y	Y	N	N	2030	Unknown	Unknown	Y	N
Aspen (floating)	6	Y	Y	N	N	2028	2024-2028	-	Y	N
Avalon	4	Y	Y	N	N	Unknown	2023	2023	N	N
Ayre (floating)	6	Y	Y	N	N	2033	2029-2033	-	Y	N
Beatrice	1	Y	Y	N	N	May-19	2017-2019	2017-2018	N	N
Beech (floating)	6	Y	Y	N	N	2028	2027-2028	-	Y	N
Bellrock	6	Y	Y	N	N	2030	Unknown	Unknown	Y	N
Berwick Bank	4	Y	Y	N	N	2033	2025-2033	2026-2030	Y	**Y**
Blyth Offshore Demonstrator Project - Phase 1	1	Y	Y	N	Y	Jun-18	2017-2018	-	N	N
Blyth Offshore Demonstrator Project - Phase 2 (floating)	3	Y	Y	N	Y	2025	2025	-	N	N
Bowdun	6	Y	Y	N	N	2032	2028-2032	2028-2032	Y	N
BP Alternative Energy Investments INTOG (Flora)	6	Y	Y	N	N	Unknown	Unknown	Unknown	N	N

Project	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
		HP	MW	HS	GS	Date operational	Construction Phase	Foundation piling period		
Broadshore	6	Y	Y	N	N	2028	Unknown	Unknown	Y	N
Buchan Offshore Wind (floating)	6	Y	Y	N	N	2033	2029-2032	2029-2032	Y	N
Caledonia Offshore Wind Farm	6	Y	Y	N	N	2030	2028-2030	2028-2030	Y	N
CampionWind	6	Y	Y	N	N	2028	Unknown	-	Y	N
Cedar (floating)	6	Y	Y	N	N	2028	2027-2028	-	Y	N
Cenos	6	Y	Y	N	N	2030	2027-2030	-	Y	N
Culzean Floating Wind Pilot Project	6	Y	Y	N	N	2024	Unknown	-	N	N
Dogger Bank A	2	Y	Y	Y	Y	2024	2022 - 2023	2022 - 2023	N	N
Dogger Bank B	2	Y	Y	Y	Y	2025	2023 - 2024	2023 - 2024	N	N
Dogger Bank C	3	Y	Y	Y	Y	2026	2024 - 2025	2024 - 2025	N	N
Dogger Bank D	6	Y	Y	Y	Y	2030	2027 - 2029	Unknown	Y	N
Dogger Bank South (East and West)	5	Y	Y	Y	Y	2033	2026 - 2033	2027 - 2031	Y	**Y**
Dolphyn Project - commercial (floating)	6	Y	N	N	N	2034	-	-	Y	N
Dolphyn Project - pre-commercial (floating)	6	Y	N	N	N	2027	-	-	Y	N
Dudgeon	1	Y	Y	Y	Y	2017	2016-2017	-	N	N

Project	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
		HP	MW	HS	GS	Date operational	Construction Phase	Foundation piling period		
Dudgeon Extension	3	Y	Y	Y	Y	2030	2027-2033	2027-2033	Y	**Y**
East Anglia ONE	1	Y	Y	Y	Y	Jul-20	2018-2020	2018-2019	N	N
East Anglia Hub (East Anglia ONE North)	3	Y	Y	Y	Y	2028	2027-2028	2027-2028	Y	**Y**
East Anglia Hub (East Anglia THREE)	3	Y	Y	Y	Y	2026	2024-2026	2025	N	N
East Anglia Hub (East Anglia TWO)	3	Y	Y	Y	Y	2027	2024-2026	2024-2025	N	N
Five Estuaries	4	Y	Y	Y	Y	2030	2028-2030	2028-2030	Y	**Y**
ForthWind Demo Phase 1	3	Y	Y	N	N	Oct-24	2024	2024	N	N
Galloper	1	Y	Y	Y	Y	Apr-18	2016-2018	-	N	N
Greater Gabbard	1	Y	Y	Y	Y	2009	2008-2009	-	N	N
Greenvolt (floating)	4	Y	Y	N	N	2026	2024-2026	2024-2026	N	N
Gunfleet Sands 3 (Demo Zone)	1	Y	Y	Y	Y	2013	2012-2013	-	N	N
Gunfleet Sands I	1	Y	Y	Y	Y	2010	2008-2010	-	N	N
Harbour Energy South INTOG	6	Y	Y	N	N	Unknown	Unknown	Unknown	N	N
Hornsea Project One	1	Y	Y	Y	Y	Dec-19	2017-2021	2017-2019	N	N

Project	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
		HP	MW	HS	GS	Date operational	Construction Phase	Foundation piling period		
Hornsea Project Two	2	Y	Y	Y	Y	2022	2021-2022	2021	N	N
Hornsea Project Three	3	Y	Y	Y	Y	2028	2024-2028	2024-2027	Y	**Y**
Hornsea Project Four	3	Y	Y	Y	Y	2030	2026-2030	2027-2028	Y	**Y**
Humber Gateway	1	Y	Y	Y	Y	2015	2013-2015	-	N	N
Hywind Scotland Pilot Park	1	Y	Y	N	N	2017	2016-2017	Floating	N	N
Inch Cape	3	Y	Y	N	N	2026	2023-2026	2023-2026	N	N
Inner Dowsing	1	Y	Y	Y	Y	2009	2007-2009	-	N	N
Kentish Flats	1	Y	Y	Y	Y	2005	2004-2005	-	N	N
Kentish Flats Extension	1	Y	Y	Y	Y	2015	2014-2015	-	N	N
Kincardine - Phase 1	1	Y	Y	N	N	Oct-2018	-	Floating	N	N
Kincardine - Phase 2	1	Y	Y	N	N	Aug-2021	2020-2021	2021	N	N
Levenmouth (Demo)	1	Y	Y	N	N	2013	2013	-	N	N
Lincs	1	Y	Y	Y	Y	2013	2011-2013	-	N	N
London Array	1	Y	Y	Y	Y	2013	2011-2013	-	N	N
Lynn	1	Y	Y	Y	Y	2008	2007-2008	-	N	N

Project	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
		HP	MW	HS	GS	Date operational	Construction Phase	Foundation piling period		
MaramWind (floating)	6	Y	Y	N	N	2030	2026-2030	-	Y	N
Moray East	2	Y	Y	N	N	Oct-22	2019-2022	2019-2020	N	N
Moray West	2	Y	Y	N	N	2025	2023-2025	2023-2024	N	N
Morven	6	Y	Y	N	N	2030	2027-2030	-	Y	N
Muir Mhòr (floating)	6	y	y	N	N	2030	2027-2030	-	Y	N
Neart na Gaoithe	2	Y	Y	N	N	2024	2020-2024	2021-2024	N	N
Norfolk Boreas	3	Y	Y	Y	Y	Unknown	Unknown	Unknown	N	N
Norfolk Vanguard	3	Y	Y	Y	Y	2027	2026-2027	2026	Y	**Y**
Ossian	6	Y	Y	N	Y	2028	2024-2028	-	Y	N
Outer Dowsing	4	Y	Y	Y	Y	2030	2026-2030	2026-2030	Y	**Y**
Pentland (floating)	3	Y	Y	N	N	2024	2024		N	N
Pentland Floating Demo (formerly Dounreay Tri)	3	Y	Y	N	N	2026	2024	-	N	N
Race Bank	1	Y	Y	Y	Y	2017	2016-2017	-	N	N
Rampion 2	4	Y	Y	N	N	2030	2026-2030	2026-2027	Y	**Y**
Rampion Wind Farm	1	Y	Y	N	N	Nov-18	2015-2018	2016	N	N
Salamander (floating)	6	Y	Y	N	N	2029	2028-2029	-	Y	N

Project	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
		HP	MW	HS	GS	Date operational	Construction Phase	Foundation piling period		
Scroby Sands	1	Y	Y	Y	Y	2004	2003-2004	-	N	N
Scaraben	6	Y	Y	N	N	2028	Unknown	Unknown	Y	N
Seagreen (formerly Alpha Bravo)	2	Y	Y	N	N	Jan-23	2021-2022	-	N	N
SENSEWind Demonstrator	6	Y	Y	N	N	Unknown	Unknown	Unknown	N	N
SENSEWind Pelastar Full-Scale Prototype	6	Y	Y	N	N	Unknown	Unknown	Unknown	N	N
Sheringham Shoal	1	Y	Y	Y	Y	2012	2009-2012	-	N	N
Sheringham Shoal Extension	3	Y	Y	Y	Y	2030	2027-2033	2027-2033	Y	**Y**
Sofia (formerly Dogger Bank Teesside B)	3	Y	Y	Y	Y	2024-2025	2024-2026	2026	N	N
Sinclair	6	Y	Y	N	N	2028	Unknown	Unknown	Y	N
Stoura	6	Y	Y	N	N	Unknown	Unknown	Unknown	N	N
Stromar	6	Y	Y	N	N	2033	2027-2033	Unknown	Y	N
Teesside	1	Y	Y	N	Y	2013	2012-2013	-	N	N
Thanet	1	Y	Y	Y	Y	2010	2009-2010	-	N	N
Triton Knoll phase 1-3	1	Y	Y	Y	Y	Mar-22	2019-2022	2020	N	N
West Of Orkney	4	Y	Y	N	N	2029	2028-2029	2028-2029	Y	**Y**

Project	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
		HP	MW	HS	GS	Date operational	Construction Phase	Foundation piling period		
Westermost Rough	1	Y	Y	Y	Y	2014	2013-2014	-	N	N

1.5.1.1.2 European OWFs long list

38. European OWF projects (Table 1.3) listed in Tier 1-6 were considered for the CEA. Where possible, known dates of construction were used to assess whether there is the potential for construction periods to overlap with North Falls (2027-2031).

39. Of the 90 European OWF projects considered, 60 are currently operational (Tier 1) and were screened out. 52 of these OWFs were operational prior to the commencement of the North Falls baseline surveys (in March 2019). The remaining eight Tier 1 projects were also screened out on the basis of there being no overlap in construction programmes with North Falls.

40. None of the 13 Tier 2 projects will have construction phases that overlap with construction of North Falls, and are therefore also screened out.

41. There are five Tier 3 European OWF projects; none of which have overlapping construction phases with North Falls, and were therefore also screened out.

42. For the seven Tier 4 and 5 projects, all have the potential for an overlap in construction with North Falls and are therefore screened in for further assessment;

    - For harbour porpoise and minke whale only:
        - Dunkerque;
        - Nordlicht I;
        - Nordlicht II;
        - Nordsee Cluster A - N-3.7; and
        - Nordsee Cluster A – N-3.8.
    - For minke whale only:
        - Galatea-Galene.

43. Of the five Tier 6 European OWF projects, one has the potential to overlap with North Falls construction, and one had insufficient information available to determine if there is the potential for the construction phase to overlap with construction of North Falls (2027-2031), and both were therefore screened out. While there is some information available on the construction programmes for the remaining three Tier 6 projects, they are all at an early stage of their planning and consenting process, and therefore there is a high level of uncertainty on (a) their construction programmes and project designs and (b) their potential for effect to marine mammal populations. All Tier 6 OWFs have therefore been screened out of further assessment.

Table 1.3 Initial CEA screening for European OWF projects within the relevant spatial area for each species and potential to overlap with North Falls construction (2028-2030) [HP = harbour porpoise, MW = minke whale, GS = grey seal, HS = harbour seal, Y = Yes, N = No]

Project	Country	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
			HP	MW	HS	GS	Date operational	Construction phase	Foundation piling period		
Albatros	Germany	1	Y	Y	N	N	Jan-20	2019-2020	2019	N	N
Alpha Ventus	Germany	1	Y	Y	N	N	2010	2008-2010	-	N	N
Amrumbank West	Germany	1	Y	Y	N	N	2015	2013-2015	-	N	N
Anholt	Denmark	1	N	Y	N	N	2013	2011-2013	-	N	N
AquaPrimus	Germany	6	Y	Y	N	N	-	-	-	-	N
BARD Offshore 1	Germany	1	Y	Y	N	N	2013	2010-2013	-	N	N
Belwind	Belgium	1	Y	Y	N	N	2010	2009-2010	-	N	N
Belwind Alstom Haliade Demonstration	Belgium	1	Y	Y	N	N	2014	2013-2014	-	N	N
Borkum Riffgrund I	Germany	1	Y	Y	N	N	2015	2008-2010	-	N	N
Borkum Riffgrund II	Germany	1	Y	Y	N	N	Dec-18	2017-2019	2017-2018	N	N
Borkum Riffgrund III	Germany	2	Y	Y	N	N	2025	2022-2025	2023-2025	N	N
Borssele I and II	Netherlands	1	Y	Y	N	N	Oct-20	2019-2020	2020	N	N
Borssele III and IV	Netherlands	1	Y	Y	N	N	Jan-21	2019-2021	2019-2020	N	N
Borssele Site V - Leeghwater - Innovation Plot	Netherlands	1	Y	Y	N	N	Feb-21	2020-2021	2020	N	N

Project	Country	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
			HP	MW	HS	GS	Date operational	Construction phase	Foundation piling period		
Butendiek (Offshore-Bürger- windpark)	Germany	1	Y	N	N	N	2015	2014-2015	-	N	N
Calvados	France	2	Y	Y	N	N	2024	2022-2024	2022-2024	N	N
Dan Tysk	Germany	1	Y	Y	N	N	2015	2013-2015	-	N	N
Deutsche Bucht	Germany	1	Y	Y	N	N	Sep-19	2018-2019	2018-2019	N	N
Dieppe - Le Treport	France	2	Y	Y	N	N	2026	2023-2026	2024-2025	N	N
Dunkerque	France	4	Y	Y	N	N	2028	2026-2028	2026-2028	Y	**Y**
Egmond aan Zee (aka OWEZ)	Netherlands	1	Y	Y	N	N	2007	2006-2007	2007	N	N
EnBW He Dreiht	Germany	3	Y	Y	N	N	2025	2024-2025	2024	N	N
Eneco Luchterduinen	Netherlands	1	Y	Y	N	N	2015	2014-2015	-	N	N
ENOVA Ems Emden	Germany	1	Y	Y	N	N	2004	2004	-	N	N
Eoliennes du Calvados	France	2	Y	Y	N	N	2025	2022-2024	2024	N	N
Fécamp	France	2	Y	Y	N	N	2023	2020-2023	2020-2023	N	N
FLAGSHIP - Metcentre (floating)	Norway	3	Y	Y	N	N	Floating	2022	2022	N	N
Frederikshavn	Denmark	1	N	Y	N	N	2003	2002-2003	-	N	N
Galatea-Galene	Sweden	4	N	Y	N	N	2029	2026-2029	2026-2029	Y	**Y**

Project	Country	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
			HP	MW	HS	GS	Date operational	Construction phase	Foundation piling period		
Gemini ZeeEnergie	Netherlands	1	Y	Y	N	N	Apr-17	2015-2017	-	N	N
Global Tech I	Germany	1	Y	Y	N	N	2015	2012-2015	-	N	N
Gode Wind 1 and 2	Germany	1	Y	Y	N	N	2017	2015-2017	-	N	N
Gode Wind 3	Germany	2	Y	Y	N	N	2023-2024	2023-2024	2023-2024	N	N
Hohe See	Germany	1	Y	Y	N	N	Nov-19	2020-??	Unknown	N	N
Hollandse Kust Nord Holland I and II	Netherlands	2	Y	Y	N	N	2022-2023	2022-2023	2022-2023	N	N
Hollandse Kust West VI	Netherlands	2	Y	Y	N	N	2026	-	2023-2026	N	N
Hollandse Kust West VII	Netherlands	3	Y	Y	N	N	2026	2025-2026	2025-2026	N	N
Hollandse Kust Zuid Holland I and II - Chinook	Netherlands	2	Y	Y	N	N	2022-2023	2022-2023	Jun-23	N	N
Hollandse Kust Zuid Holland III and IV	Netherlands	2	Y	Y	N	N	2022-2023	2022-2023	Jun-23	N	N
Horns Rev 1	Denmark	1	Y	Y	N	N	2002	2002	-	N	N
Horns Rev 2	Denmark	1	Y	Y	N	N	2010	2008-2010	-	N	N
Horns Rev 3	Denmark	1	Y	Y	N	N	Aug-19	2018-2019	Unknown	N	N
Hywind Tampen	Norway	1	Y	Y	N	N	2023	2022	Jun-23	N	N

Project	Country	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
			HP	MW	HS	GS	Date operational	Construction phase	Foundation piling period		
Karmøy - Marine Energy Test Centre (Metcentre) - Fixed	Norway	1	Y	Y	N	N	Jan-2009	Unknown	Unknown	N	N
Karmøy - Marine Energy Test Centre (Metcentre) - Floating	Norway	1	Y	Y	N	N	Unknown	Unknown	Floating	N	N
Kaskasi	Germany	1	Y	Y	N	N	2022	2021-2022	2022	N	N
Meerwind Ost Sud	Germany	1	Y	Y	N	N	2014	2012-2014	-	N	N
Merkur	Germany	1	Y	Y	N	N	Jun-19	2017-??	2017-2018	N	N
Nissum Bredning Vind	Denmark	1	Y	Y	N	N	2017	2017-2018	Mar-18	N	N
Nobelwind	Belgium	1	Y	Y	N	N	-	2016-2017	2017	N	N
Nordergrunde	Germany	1	Y	Y	N	N	2016	2016-2017	2017	N	N
Nordlicht I	Germany	4	Y	Y	N	N	2027	2026-2027	2026-2027	Y	Y
Nordlicht II	Germany	5	Y	Y	N	N	2028	2027-2028	2027-2028	Y	Y
Nordsee Cluster A - N-3.7	Germany	4	Y	Y	N	N	2027	2026-2027	2026-2027	Y	Y
Nordsee Cluster A - N-3.8	Germany	4	Y	Y	N	N	2027	2026-2027	2026-2027	Y	Y
Nordsee Cluster B - N-3.5	Germany	6	Y	Y	N	N	2029	2028-2029	2028-2029	Y	N

Project	Country	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
			HP	MW	HS	GS	Date operational	Construction phase	Foundation piling period		
Nordsee cluster B - N-3.6	Germany	6	Y	Y	N	N	2029	2028-2029	2028-2029	Y	N
Nordsee One (Innogy Nordsee I)	Germany	1	Y	Y	N	N	2015-2016	2015-2017	2017	N	N
Nordsee Ost	Germany	1	Y	Y	N	N	-	2012-2015	2015	N	N
Normandie	France	6	Y	Y	N	N	2031	2030-2031	2030-2031	Y	N
Norther	Belgium	1	Y	Y	N	N	Unknown	2018-2019	Jun-19	N	N
Northwester 2	Belgium	1	Y	Y	N	N	Unknown	2019-2020	May-20	N	N
Northwind	Belgium	1	Y	Y	N	N	-	2013-2014	2014	N	N
Prinses Amalia Windpark (formerly Q7)	Netherlands	1	Y	Y	N	N	2006-2007	2006-2007	2008	N	N
Rental	Belgium	1	Y	Y	N	N	Unknown	2017-2018	Dec-18	N	N
Riffgat	Germany	1	Y	Y	N	N	-	2012-2014	2014	N	N
Rønland (Nissum Bredning)	Denmark	1	Y	Y	N	N	-	2013-2014	2014	N	N
Saint-Brieuc	France	2	Y	Y	N	N	2023	2022	2022	N	N
SamsØ	Denmark	1	N	Y	N	N	2002	2002-2003	2003	N	N
Sandbank	Germany	1	Y	Y	N	N	-	2015-2017	2017	N	N
Seamade (Mermaid)	Belgium	1	Y	Y	N	N	Unknown	2017-2020	Dec-20	N	N
Seamade (SeaStar)	Belgium	1	Y	Y	N	N	Unknown	Unknown	Dec-20	N	N

Project	Country	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
			HP	MW	HS	GS	Date operational	Construction phase	Foundation piling period		
SeaTwirl S1	Sweden	1	Y	Y	N	N	Floating	2015	2015	N	N
SeaTwirl S2	Norway	3	Y	Y	N	N	2023-??	2023-??	Unknown	Unknown	N
TetraSpar Demo - Metcentre (Floating)	Norway	1	Y	Y	N	N	Floating	2021	Dec-21	N	N
Thor	Denmark	6	Y	Y	N	N	2026	2025-2026	2025-2026	N	N
Thornton Bank phase I	Belgium	1	Y	Y	N	N	-	2008-2009	2009	N	N
Thornton Bank phase II	Belgium	1	Y	Y	N	N	-	2010-2013	2013	N	N
Thornton Bank phase III	Belgium	1	Y	Y	N	N	-	2011-2013	2013	N	N
Trianel Windpark Borkum Phase 1 (Borkum West II phase 1)	Germany	1	Y	Y	N	N	2015	2011-2015	2015	N	N
Trianel Windpark Borkum Phase 2 (aka Borkum West II phase 2)	Germany	1	Y	Y	N	N	2020	2017-2020	Jul-20	N	N
TunØ Knob	Denmark	1	N	Y	N	N	1995	1995	1995	N	N
UNITECH Zefryos by Hywind Technology (Karmoy / Hywind)	Norway	1	Y	Y	N	N	2012	2009	2012	N	N
Veja Mate	Germany	1	Y	Y	N	N	2017	2016-2017	2017	N	N

Project	Country	Tier	Spatial screening area				Project programme information			Potential for construction phase overlap with construction at North Falls?	Screened into CEA?
			HP	MW	HS	GS	Date operational	Construction phase	Foundation piling period		
Vesterhav Nord/Syd	Denmark	2	Y	Y	N	N	2023	2022-2023	2023	N	N
Vindpark Falkenpark	Sweden	3	N	Y	N	N	2024	2023	2023	N	N
Westermeerwind	Netherlands	1	Y	Y	N	N	-	2015-2016	Jun-16	N	N
Windpark Fryslân	Netherlands	1	Y	Y	N	N	2020-2021	2020-2021	Nov-21	N	N
Windplanblauw	Netherlands	2	Y	N	N	N	2023	2021-2023	2021-2023	N	N

1.5.1.1.3 OWFs short list

44. Following the initial screening of UK and European OWFs, the next stage of the screening exercise was undertaken on those projects that have been identified as having the potential for cumulative construction impacts. This stage of the screening is based on known construction periods of UK and European OWF projects, including known piling and / or construction timings, in order to determine a more realistic, but still worst-case, list of UK and European OWF projects that may the potential for overlapping piling with North Falls (Table 1.4).

45. Of the UK and European OWFs screened in for having a construction period that could potentially overlap with the construction of North Falls, six OWF could be piling at the same time as North Falls:

- Berwick Bank (for harbour porpoise and minke whale);
- Dogger Bank South (East and West) (for all marine mammal species);
- Dudgeon Extension (for all marine mammal species);
- Five Estuaries (for all marine mammal species);
- Outer Dowsing (for all marine mammal species); and
- Sheringham Shoal Extension (for all marine mammal species).

46. This more realistic short list of OWF projects that could be piling at the same time as North Falls could change as projects develop, but this is the best available information at the time of writing, and more accurately reflects the limitations and constraints to project delivery.

47. An additional 12 OWFs have the potential for an overlapping offshore construction period with North Falls, however, there is no potential for the piling periods to overlap:

- Dunkerque;
- East Anglia Hub (East Anglia ONE North);
- Galatea-Galene;
- Hornsea Project Four;
- Hornsea Project Three;
- Nordlicht I;
- Nordlicht II;
- Nordsee Cluster A - N-3.7;
- Nordsee Cluster A - N-3.8;
- Norfolk Vanguard;
- Rampion 2; and
- West Of Orkney.

Table 1.4 Screening of OWFs for potential cumulative piling activities [HP = harbour porpoise, MW = minke whale, GS = grey seal, HS = harbour seal, Y = Yes, N = No]

Name of Project	Tier	Spatial screening area				Piling dates	Overlap of piling at North Falls (2030 or 2031)	Screened in CEA for piling?
		HP	MW	GS	HS			
Berwick Bank	4	Y	Y	N	N	2026-2030	Y	**Y**
Dogger Bank South (East and West)	5	Y	Y	Y	Y	2027-2031	Y	**Y**
Dudgeon Extension	4	Y	Y	Y	Y	2027-2033	Y	**Y**
Dunkerque	4	Y	Y	N	N	2026-2028	N	N
East Anglia Hub (East Anglia ONE North)	3	Y	Y	Y	Y	2027-2028	N	N
Five Estuaries	5	Y	Y	Y	Y	2028-2030	Y	**Y**
Galatea-Galene	4	N	Y	N	N	2026-2029	N	N
Hornsea Project Four	3	Y	Y	Y	Y	2027-2028	N	N
Hornsea Project Three	3	Y	Y	Y	Y	2024-2027	N	N
Jammerland Bugt	4	N	Y	N	N	2027	N	N
Nordlicht I	4	Y	Y	N	N	2026-2027	N	N
Nordlicht II	5	Y	Y	N	N	2027-2028	N	N
Nordsee Cluster A - N-3.7	4	Y	Y	N	N	2026-2027	N	N
Nordsee Cluster A - N-3.8	4	Y	Y	N	N	2026-2027	N	N
Norfolk Vanguard	3	Y	Y	Y	Y	2026	N	N
Outer Dowsing	5	Y	Y	Y	Y	2026-2030	Y	**Y**
Rampion 2	4	Y	Y	N	N	2026-2027	N	N

Name of Project	Tier	Spatial screening area				Piling dates	Overlap of piling at North Falls (2030 or 2031)	Screened in CEA for piling?
		HP	MW	GS	HS			
Sheringham Extension	4	Y	Y	Y	Y	2027-2033	Y	**Y**
West Of Orkney	4	Y	Y	N	N	2028-2029	N	N

1.5.1.2 Operational noise of WTGs

48. The noise levels associated with operation OWFs is relatively low, with recorded levels of between 141 and 146dB re 1µPs-m (RMS SPL) at four UK OWFs (MMO, 2015; Cheesman *et al.,* 2016), and levels of 106 and 126dB re 1µPa-m (RMS SPL) at three operational OWFs in Sweden and Denmark, which was not audible for harbour porpoise at a distance of 70m from WTG (Tougaard *et al.,* 2009). It has also been predicted that within a few hundred metres of a wind turbine, noise would be comparable to background noise levels (MMO, 2015). Due to the low noise levels associated with operational OWFs, the BEIS (2020) Record of Consents (RoC) Habitats Regulation Assessment (HRA) for the Southern North Sea Special Area of Conservation (SAC) concluded that there would no potential for significant effect from the operation of OWFs, alongside the construction of OWFs (BEIS, 2020).

49. Therefore, operational OWFs are **screened out** from further consideration within the CEA screening.

50. The potential for cumulative effects from operational wind turbines at North Falls with other projects and activities has also been **screened out** from further consideration within the CEA screening.

1.5.1.3 Vessel presence at operational OWFs

51. There is the potential for vessels to be present throughout the operational phase of OWFs, in order to undertake maintenance activities. While the number of vessel present are likely to be less than during the construction phase, they are also likely to be present for longer periods of time, with the operational phases of OWFs being upwards of 25 years.

52. The long-term presence of vessels at operational OWFs has the potential for both increased collision risk with vessels, and disturbance from vessel presence, and is therefore **screened in** for further assessment.

1.5.1.4 Maintenance activities at OWFs

53. Maintenance activities at OWFs, such as such as additional rock placement or cable re-burial, will be very localised, short in duration and temporary.

54. The potential for cumulative effects from maintenance activities, including vessels at OWFs, would be less than the cumulative effects assessed for construction activities other than piling.

55. Therefore, maintenance of OWFs is **screened out** from further consideration within the CEA screening.

1.5.1.5 Decommissioning of OWFs

56. There is currently no information on any OWFs that could be decommissioning during the construction of North Falls. Therefore, decommissioning of OWFs is screened out from further consideration within the CEA screening.

57. The potential for cumulative impacts during the decommissioning of North Falls are currently unknown. The potential effects for the decommissioning of North Falls, including an up-to-date CEA will be assessed prior to any decommissioning activities. Therefore, the decommissioning of North Falls has also been **screened out** from further consideration within this CEA screening.

1.5.2 Marine renewable energy (wave and tidal) developments

58. Marine renewable energy (MRE) projects (e.g., wave and tidal) assessed in the CEA screening were Tier 1-6 for UK based projects, and Tier 1-3 for other European projects.

59. UK based projects listed in Tiers 1-4 were considered for potential construction, operational cumulative impacts, if those phases could overlap with the proposed construction of North Falls and sufficient information was available to determine this. Where no information was known on the potential construction phases of the other renewable energy projects, it was assumed that all Tier 2 and 3 projects would have completed construction prior to the construction of North Falls. It was also assumed that all Tier 1 renewable energy projects are considered to be part of the existing baseline environment. No European projects have been screened in (at Tier 3 or above). The results of the screening are in Table 1.5.

60. A total of 36 projects were considered for the CEA, none of which could have the potential for construction to overlap with the proposed construction of North Falls.

61. All but seven currently operational tidal projects (Tier 1) have been operational since the start of the baseline surveys for North Falls (March 2019), and are therefore screened out from further consideration in the CEA.

62. Piling is highly unlikely to be used during the installation of wave and tidal projects. The installation of wave / tidal projects is typically using drilled pin piles or gravity bases. Percussive piling is not anticipated to be used as an installation method and therefore the noise impacts during construction will have a very limited impact range, especially compared to OWFs.

63. The construction of wave or tidal developments is highly unlikely to contribute to the cumulative effect of the disturbance of marine mammals from underwater noise sources. In addition, all marine renewable energy projects are located at significant distance from the offshore array areas with the closest being located to the south of the Isle of Wight (approximately 320km from the closest point of the offshore project area). Therefore, the potential for cumulative effect from the construction of marine renewable energy projects with North Falls have not been included in the CEA.

64. The O&M of wave and tidal projects are also highly unlikely to contribute to the cumulative impacts of the disturbance of marine mammals from underwater noise sources and therefore have not been included in the CEA.

65. Potential effects during the operation of tidal projects include collision risk. However, tidal projects will have to have effective mitigation and monitoring to reduce the collision risk for marine mammals. Therefore, collision risk with tidal devices has been screened out of the CEA.

66. The construction, O&M of all wave and tide projects have been screened out of the CEA (Table 1.5).

Table 1.5 CEA screening for MRE projects within relevant spatial areas and potential overlap with North Falls construction [HP = harbour porpoise, MW = minke whale, GS = grey seal, HS = harbour seal, Y = Yes, N = No]

Project	Type	Tier	Spatial screening area				Operational dates	Construction dates	Screened into CEA?
			HP	MW	GS	HS			
Ameland Tidal Site	Tidal	1	Y	Y	N	N	2022	n/a	N
Blue Accelorator	Wave	1	Y	Y	N	N	2020	n/a	N
Danish Wave Energy Center	Wave	1	Y	Y	N	N	2015	n/a	N
DMEC - Marsdiep	Wave	1	Y	Y	N	N	2015	n/a	N
EMEC Aquantis	Tidal	3	Y	Y	N	N	2023-24	n/a	N
EMEC AWS Waveswing	Wave	2	Y	Y	N	N	2022	n/a	N
EMEC Blue Horizon	Wave	3	Y	Y	N	N	2025	2023-24	N
EMEC Magallanes 2	Tidal	1	Y	Y	N	N	2019	n/a	N
EMEC MPS	Wave	3	Y	Y	N	N	2025-26	2023-24	N
EMEC Ocean Energy	Wave	6	Y	Y	N	N	unknown	unknown	N
EMEC Orbital O2	Tidal	1	Y	Y	N	N	2021	n/a	N
EMEC Orbital O2 - Phase 2	Tidal	3	Y	Y	N	N	2023-24	n/a	N
EMEC Stronsay Firth	Tidal	6	Y	Y	N	N	unknown	unknown	N
Lashy Sound Phase 1	Tidal	6	Y	Y	N	N	Unknown	Unknown	N
Lashy Sound Phase 2	Tidal	6	Y	Y	N	N	Unknown	Unknown	N
MeyGen Pentland Firth Phase 1a	Tidal	1	Y	Y	N	N	2018	n/a	N
MeyGen Pentland Firth Phase 2	Tidal	3	Y	Y	N	N	2027	2024-26	N
MeyGen Pentland Firth Phase 3	Tidal	3	Y	Y	N	N	2028	2025-27	N
MeyGen Pentland Firth Phase 4	Tidal	6	Y	Y	N	N	Unknown	Unknown	N
MeyGen Pentland Firth Phase 5	Tidal	6	Y	Y	N	N	unknown	Unknown	N
Mocean Energy Orkney	Wave	1	Y	Y	N	N	2023-24	n/a	N
Nissum Bredning Test Station	Wave	1	Y	Y	N	N	2000	n/a	N

Project	Type	Tier	Spatial screening area				Operational dates	Construction dates	Screened into CEA?
			HP	MW	GS	HS			
Nova Innovation Shetland Tidal Array	Tidal	1	Y	Y	N	N	2016	n/a	N
Nova Innovation Yell Sound Array	Tidal	6	Y	Y	N	N	unknown	Unknown	N
Orbital Marine Eday 1	Tidal	3	Y	Y	N	N	2026-27	Unknown	N
Orbital Marine Eday 2	Tidal	3	Y	Y	N	N	unknown	Unknown	N
Orbital Marine Eday 3	Tidal	3	Y	Y	N	N	2028	2025-27	N
Orbital Marine Eday 4	Tidal	3	Y	Y	N	N	2028	2025-27	N
Orbital Marine Power Westray	Tidal	6	Y	Y	N	N	Unknown	unknown	N
Perpetuus Tidal Energy Centre (PTEC)	Tidal	3	Y	Y	N	N	2025	2023-24	N
Seastar	Tidal	3	Y	Y	N	N	Unknown	Unknown	N
TTC-GD	Tidal	1	Y	Y	N	N	2018	n/a	N
Westray South	Tidal	6	Y	Y	N	N	unknown	unknown	N

1.5.3 Geophysical surveys

67. High resolution geophysical surveys are often undertaken prior to works offshore to determine seabed conditions, check for debris and other anomalies. These are often undertaken for OWFs, but can be for any industry / project.

68. These high-resolution geophysical surveys can involve different equipment, such as:

- Sub-Bottom Profilers (SBP) (such as pingers, sparkers, boomers and CHIRP systems);
- Ultra-Short Baseline (USBL) systems;
- Multibeam Echo Sounder (MBES) system; and
- Side Scan Sonar (SSS).

69. Due to the high amplitude of MBES and SSS, there is the potential for auditory injury to marine mammal species, however this is highly unlikely as an animal would need to be within very close proximity of the source. It is also unlikely that the MBES and SSS could cause disturbance due to the operating frequencies being outside the audible range of marine mammals (JNCC *et al.,* 2010). MBES and SSS surveys that are carried out in waters of less than 200m in depth are not considered to be a risk to marine mammals, as that the higher frequencies typically used fall outside of their hearing ranges, and the sounds are likely to attenuate quickly due to the high frequencies used. Therefore, geophysical surveys using MBES and SSS have been screened out of the CEA.

70. The SBP and USBL frequency ranges are within marine mammal hearing range (JNCC, 2017), and will therefore be audible to the marine mammals that could be present in the area. Geophysical surveys using SBP and USBL have the potential to disturb marine mammals and have therefore been screened in to the CEA.

71. Auditory injury effects from SBP and USBL are not predicted, as an animal would need to remain in the very small zone of personification for a prolonged period, which is highly unlikely (JNCC *et al.,* 2010). Most of the sound energy generated by the SBP or USBL equipment will be directed towards the seabed and the pulse duration is extremely short, with the continuous movement of the survey.

72. Geophysical surveys for North Falls will be assessed separately prior to the surveys being undertaken, based on the type of survey required, equipment used, area covered, time of year and duration, including cumulative effects during geophysical surveys at the offshore project area. However, as assessment of geophysical surveys taking place at other projects, at the same time as construction at North Falls, has been **screened in** for further assessment in the CEA.

73. The number and location of any geophysical surveys that may be happening at the same time North Falls construction are currently unknown, and as these surveys can have very short lead-in times, this would not be known until much closer to the construction being undertaken. Therefore, to inform the CEA, data

on previously undertaken geophysical surveys in the North Sea has been analysed.

74. Analysis of the geophysical surveys reported to the Marine Noise Registry (MNR), indicated in the year 2021 in the North Sea, there was a total of 30 sub-bottom profiler surveys carried out for a total of 257 days. The amount undertaken in 2021 suggests an average of less than one geophysical survey at any one time within a year. As a worst case scenario the CEA within the ES Chapter 12 Marine Mammals (Document Reference: 3.1.14) has assessed up to two potential geophysical surveys to occur in the North Sea at any one time. Based on the MNR analysis findings, this is a precautionary approach.

1.5.4 Oil and gas

1.5.4.1 Installation and decommissioning

75. Oil and gas production and decommissioning projects could have the potential for cumulative effects during the construction of North Falls. Plans or projects considered during the CEA screening were Tier 1-4 for UK based projects.

76. Tier 2-4 projects were initially considered for potential cumulative effects if those projects could overlap with the construction of North Falls.

77. As outlined in the BEIS (2020) ROC HRA for the Southern North Sea SAC, the use of cutting equipment is predicted to be required primarily during decommissioning activities. There is limited information on the level of noise arising from cutting equipment. However, one published study measured the level of noise from a diamond wire cutter at an offshore gas platform (Pangerc *et al.,* 2017). The results indicated that increases in noise of between 4dB and 15dB at frequencies predominantly above 5kHz could be attributed to the cutting equipment. There was no increase in sound above that from the associated vessels detected at lower frequencies.

78. Based on currently available information, underwater noise during decommissioning of oil and gas installations would be less than levels for PTS to occur and any disturbance would be localised and not be significantly greater than that arising from vessels. Therefore, potential cumulative effects from decommissioning activities, such as cutting equipment has been **screened out** from further consideration in the CEA.

79. The potential for cumulative effects from vessels associated with the decommissioning of oil and gas installations has also been screened out from further consideration in the CEA. As the potential effects of any vessels associated with the decommissioning of oil and gas installations is unlikely to be significantly greater than vessel activity at these sites during the operational phase of the oil and gas installations. Therefore, potential cumulative effects from vessels during decommissioning of oil and gas installations has been **screened out** from further consideration in the CEA.

80. Of the 124 oil and gas projects considered, 106 were decommissioning projects. Taking into account the potential for any significant contribution to cumulative effect and the distances of the projects in relation to North Falls, any potential cumulative effects during decommissioning of oil and gas installations has been screened out from further consideration in the CEA.

81. Oil and gas installations that were operational prior to the North Falls baseline surveys in March 2019 are considered part of the baseline environment. Therefore, any potential cumulative effects from operational oil and gas installations have been screened out from further consideration in the CEA.

82. Of the other 15 projects considered, none had construction phases with the potential to overlap with the construction of North Falls and are therefore screened out from further consideration in the CEA.

83. The results of the screening are in Table 1.6.

Table 1.6 CEA screening for oil and gas projects (both decommissioning and production projects are included) within relevant spatial areas and with the potential to overlap with North Falls construction [HP = harbour porpoise, MW = minke whale, GS = grey seal, HS = harbour seal, Y = Yes, N = No]

Project	Type of oil and gas project	Tier	Expected date of activity	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Abigail Field Development	Consented	3	Application submitted July 2021. Construction 2022 & 2024.	N	N	N
Affleck Re-development	Consented	3	Construction Q2 2023 - Q2 2024	N/A	N	N
Alma & Galia	Decommissioning	2	2021-2027	N	N	N
Alwyn East Development	Consented	3	Application submitted September 2021. Construction spring 2022, completion by September 2022.	N	N	N
Amethyst A1D, A2D, B1D & C1D Topsides	Decommissioning	2	2021-2026	N	N	N
Anglia Field	Decommissioning	2	2020-2022	N	N	N
Ann and Alison	Decommissioning	2	Q1 2020 - Q2 2023	N	N	N
Atlantic and Cromarty	Decommissioning	4	2017-2021	N	N	N
Audrey	Decommissioning	2	Q1 2019 - Q2 2023	Y	N	N
Avalon	Application submitted	4	Application submitted November 2021. Construction Q1 2024, completion by Q3 2025.	N	N	N

Project	Type of oil and gas project	Tier	Expected date of activity	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Balmoral	Decommissioning	2	2021-2027	N	N	N
Banff and Kyle Decommissioning Programmes	Decommissioning	3	2022-2026	N	N	N
Beatrice	Decommissioning	3	2022-2030	N	Y	N
Beauly	Decommissioning	4	2025-2028	N	Y	N
Brae Alpha, Brae Bravo, Central Brae, West Brae and Sedgwick	Decommissioning	4	2019-2029	N	Y	N
Brae Bravo Topsides, Flare Bridge, Flare Tower and Flare Jacket and Substructure	Decommissioning	2	2019-2020	Y	N	N
Brenda	Decommissioning	2	2021-2027	N	N	N
Brent	Decommissioning	4	2022-2026	N	N	N
Brent Alpha Jacket	Decommissioning	2	2018-2025	Y	N	N
Brent Alpha, Bravo and Charlie Topsides	Decommissioning	2	Q1 2018 - Q3 2024	Y	N	N
Brent Field	Decommissioning	2	2020-2024	N	N	N
Brynhild	Decommissioning	2	2019-2021	Y	N	N
Buchan & Hannay	Decommissioning	2	2019-2025	Y	N	N
Buchan Redevelopment	Application submitted	4	Drilling Q2 2025 - Q4 2026. Commissioning Q2-Q4 2026. Operations Q4 2026.	N	N	N

Project	Type of oil and gas project	Tier	Expected date of activity	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Burghley	Decommissioning	4	2025-2028	N	Y	N
Caister	Decommissioning	2	2019-2022	Y	N	N
Caledonia	Decommissioning	3	2022-2028	N	Y	N
Cambo Phase 1 Field Development	Production licence	4	Application submitted June 2021. Construction planned for 2021-2025 (but not yet consented), operational by 2025.	N	N	N
Captain EOR Stage 2 Phase II Development	Consented	3	Construction Q1 2023 - Q2 2024	N/A	N	N
Causeway and Fionn	Decommissioning	4	2022-2027	N	N	N
Cavendish	Decommissioning	2	2019-2022	Y	N	N
CDP3 Decommissioning Programmes for Murdoch Installations and Trunk Pipelines, CDP3	Decommissioning	3	2021 - 2027	N/A	N	N
Chestnut Phase 2	Decommissioning	3	2022 - 2029	N	Y	N
Conrie, Don SW, W Don and Ythan Decommissioning Programmes	Decommissioning	2	2021-2029	N	Y	N
Cormorant Alpha Topsides	Decommissioning	3	2022-2028	N	Y	N
Cormorant Alpha Derrick Structure Removal& MDR Installation	Decommissioning	2	2020-2021	N	N	N

Project	Type of oil and gas project	Tier	Expected date of activity	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Curlew B&D and Curlew C	Decommissioning	2	2019-2023	Y	N	N
Decommissioning Programmes for Caister-Murdoch System III Installations and Pipelines, CDP2	Decommissioning	3	Construction Q1 2021 - Q4 2027	N/A	N	N
Devenick	Decommissioning	2	2024 - 2030	N	yes	N
Duart Decommissioning Programmes	Decommissioning	4	2029-2034	N/A	N	N
Dunlin Alpha	Decommissioning	2	2016-2026	Y	N	N
Dunlin Alpha Field	Decommissioning	4	2021-2026	N	N	N
East Brae Upper jacket	Decommissioning	4	2025-2027	N	N	N
Eider	Decommissioning	2	2019-2028	Y	N	N
Ensign installation DP	Decommissioning	3	2022-2026	N	N	N
Foinaven FPSO Offstation Decommissioning Programmes	Decommissioning	2	2021-2022	N/A	N	N
Fulmar & Auk North	Decommissioning	2	2017-2021	Y	N	N
Fulmar and Auk North Topsides, Subsea Facilities and Pipelines Decommissioning Programme	Decommissioning	3	2026-2033	N	Y	N
Gaupe Decommissioning Programme	Decommissioning	3	2022-2031	N	Y	N
Garrow	Decommissioning	4	2025-2027	N	N	N
Glamis	Decommissioning	2	2021-2027	N	N	N

Project	Type of oil and gas project	Tier	Expected date of activity	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Goldeneye	Decommissioning	2	2018-2024	Y	N	N
Guinevere	Decommissioning	2	2018-2022	Y	N	N
Heather pipelines	Decommissioning	3	2025-2036	N	Y	N
Heather Topsides Decommissioning Programme	Decommissioning	2	2021-2026	N	N	N
Heather Upper Jacket	Decommissioning	3	2025 - 2032	N	Y	N
Helvellyn	Decommissioning	3	2024-2027	N	Y	N
Hewett Area Subsea Installations	Decommissioning	4	2022-2028	N	Y	N
Hewett Platforms	Decommissioning	3	2022-2029	N	Y	N
Hummingbird FPSO Sailaway and Chestnut riser disconnection	Decommissioning	3	2022-2028	N	Y	N
Hunter & Rita Decommissioning Programme	Decommissioning	3	2021-2025	N	N	N
Huntington	Decommissioning	2	2021-2028	N	Y	N
Huntington	Decommissioning	2	2020	N	N	N
Indefatigable 18A Topsides Decommissioning Programme	Decommissioning	3	2022-2029	N	Y	N
Jackdaw Field Development	Consented	3	Application submitted May 2021.	N	N	N

Project	Type of oil and gas project	Tier	Expected date of activity	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
			Construction 2023-2024, operational by 2024.			
Jacky	Decommissioning	3	Q1 2022 - Q3 2023	N	N	N
Johnston Decommissioning Programmes	Decommissioning	4	2027-2029	N/A	Y	N
Juliet	Decommissioning	2	2019-2021	Y	N	N
Ketch	Decommissioning	2	Q3 2018 - Q1 2022	Y	N	N
Kingfisher Decommissioning Programme	Decommissioning	2	2019-2024	Y	N	N
Knarr Gas Pipeline	Decommissioning	4	2024-2026	N	N	N
Lancaster Field FPSO Decommissioning Programme	Decommissioning	4	Decom 2024	N/A	N	N
Leman 27H and 27J Topsides	Decommissioning	3	2023 - 2024	N	N	N
LOGGS PR, LOGGS PC, LOGGS PP, LOGGS PA, North Valiant PD, & Associated Pipelines – LDP5	Decommissioning	2	2020-2024	N	N	N
LOGGS Satellites - Mimas MN, Saturn ND and Tethys TN, and Associated Infield Pipelines – LDP2	Decommissioning	3	2022-2028	N	Y	N
LOGGS Satellites Jupiter Area	Decommissioning	2	2020-2023	N	N	N

Project	Type of oil and gas project	Tier	Expected date of activity	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
LOGGS Satellites Jupiter Area: LDP3b	Decommissioning	2	2020-2021	N	N	N
LOGGS Satellites V-Fields Area - Vanguard QD, North Valiant SP, South Valiant TD and Vulcan RD, and Associated Infield Pipelines - LDP4	Decommissioning	3	2022-2027	N	N	N
LOGGS Satellites Vulcan UR, Viscount VO, Vampire OD - LDP1	Decommissioning	2	Programme states TBC by end of 2021.	N	N	N
MacCulloch	Production licence	2	2019-2025	Y	N	N
Minke	Decommissioning	2	2019-2022	Y	N	N
Murlach Field Development (redevelopment of Skua, part of the Marnock-Skua field)	Consented	3	Q1 2024 – Q1 2025.	N/A	N	N
Nevis N11 Wellhead	Decommissioning	2	2019-2020	Y	N	N
Nicol	Decommissioning	2	2021-2027	N	N	N
Ninian Northern Platform	Decommissioning	2	2020-2025	N	N	N
North Cormorant	Decommissioning	2	2020-2028	N	Y	N
Northern Endurance Partnership	Application submitted	4	Offshore installation Q1-Q4 2026. Commissioning Q2-Q3 2027,	N	N	N

Project	Type of oil and gas project	Tier	Expected date of activity	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Northern Producer FPF Float-off and Disconnection of Risers and Pipelines	Decommissioning	2	2021-2022	N	N	N
Pegasus West Development	Production licence	4	Application submitted October 2021. Construction Q2/3 2023, operational by Q1-3 2024.	N	N	N
Pickerill Alpha (A) and Pickerill Bravo(B)	Decommissioning	2	2019-2022	Y	N	N
Pickerill Alpha (A) and Pickerill Bravo (B)	Decommissioning	2	2018-2019	Y	N	N
PL301 Heimdal to Brae Pipeline Decommissioning Programme	Decommissioning	2	2021-2026	N	N	N
PLU6294	Decommissioning	3	2023-2039	N	Y	N
Rev Decommissioning Programme	Decommissioning	2	Q4 2019 - Q4 2022	Y	N	N
Rhum Production Increase	Consented	3	Re-opening a production well only - no additional infrastructure to be built. Planned to commence in July 2021, but not yet consented.	N	N	N
Rockrose Energy	Decommissioning	2	2019-2027	Y	N	N

Project	Type of oil and gas project	Tier	Expected date of activity	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Rockrose Energy	Decommissioning	2	2020-2021	N	N	N
Rochelle Jumpers and Wellhead Protection Structures	Decommissioning	4	2024-2025	N	N	N
Rosebank Field Development	Consented	3	Construction 2024, 2025 and 2026	N/A	N	N
Saltire A Topsides and Saltire Area Subsea Infrastructure Decommissioning Programmes	Decommissioning	4	2027 - 2031	N/A	Y	N
Saturn (Annabel)	Decommissioning	2	Q2 2018 - Q2 2021	Y	N	N
Schooner	Decommissioning	2	2018-2022	Y	N	N
Scoter & Merganser Fields Decommissioning Programmes	Decommissioning	4	Q4 2024 - Q4 2026	N/A	N	N
Sean	Decommissioning	3	2023-2028	N	Y	N
Southwark Pipeline Installation Project	Consented	3	Application submitted April 2021. Construction originally planned for 2021, but not yet consented.	N	N	N
Stirling	Decommissioning	2	2021-2027	N	N	N
Talbot Field Development	Consented	3	Construction Q4 2022 - Q3 2024	N/A	N	N

Project	Type of oil and gas project	Tier	Expected date of activity	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Tartan Subsea – Tartan North Terrace (TNT) & Tartan Satellite (TS) Decommissioning Programmes	Decommissioning	4	2029 - 2034	N/A	Y	N
Tartan Topsides Decommissioning Programme	Decommissioning	4	2029 - 2032	N/A	N	N
Teal West Development	Consented	3	Construction Q3 2023 - Q1/Q2 2027	N/A	N	N
Tern Topside	Decommissioning	2	2020-2028	N	Y	N
Thistle Alpha Platform	Decommissioning	2	2019-2022	Y	N	N
Thistle Topsides	Decommissioning	3	2022-2027	N	N	N
Tolmount East Development	Production licence	3	Construction in 2023, operational by 2023	N	N	N
Topaz	Decommissioning	2	2021-2024	N	N	N
TYNE	Decommissioning	2	2018-2022	Y	N	N
Victoria	Decommissioning	3	2022-2025	N	N	N
Victory Field Development	Consented	3	Construction May - Oct 2024	N/A	N	N
Viking	Decommissioning	2	2016-2024	Y	N	N
Viking Satellites CD, DD, ED, GD, HD Pipelines	Decommissioning	2	Programme states TBC by end of 2019 (but no close out report).	N	N	N
Viking satellites KD, LD, AR	Decommissioning	2	2016-2021	Y	N	N

Project	Type of oil and gas project	Tier	Expected date of activity	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Wenlock	Decommissioning	3	2023-2025	N	N	N
Western Isles	Decommissioning	3	2023-2030	N	Y	N
Windermere	Decommissioning	2	2019-2023	Y	N	N

1.5.4.2 Oil and gas seismic surveys

84. It is currently not possible to estimate the location or number of potential seismic surveys that could be undertaken at the same time as construction and potential piling activity in the offshore project area.

85. As a precautionary approach, the potential for cumulative effects from oil and gas seismic surveys has been screened in to the CEA for further consideration.

86. It is assumed, as a worst-case scenario, that there could potentially be at least two oil and gas seismic surveys in the North Sea at any one time, during construction of North Falls. Analysis of MNR reports indicates that in the North Sea during 2021 there were 20 seismic surveys carried out for a total of 475 days. This gives a potential for just over 1 seismic survey to be undertaken at any one time in the North Sea, therefore it is realistic for up to two seismic surveys to be included within the CEA.

1.5.5 Aggregate extraction and dredging

87. Aggregate extraction and dredging projects considered for the CEA screening were Tier 1-4 for UK based projects (Table 1.7). No European projects were screened in due to a lack of information on project locations, phases, and programmes.

88. UK based projects listed in Tiers 1-4 were initially considered for potential operational cumulative effects, if those phases could overlap with the proposed construction of North Falls.

89. When in transit, noise arising from dredging vessels is comparable with that from similar sized vessels and can therefore be considered as part of the baseline noise levels.

90. When undertaking dredging activities, higher levels of broadband noise at frequencies above 1kHz are produced due to the impact or abrasion of aggregate material passing through the drag head, suction pipe and pump. The overall level of noise was found to be higher when extracting gravel compared to when extracting sand (Robinson *et al.,* 2011).

91. As outlined in ES Appendix 12.4 (Document Reference: 3.3.9), the underwater noise modelling indicates the risk of permanent change in hearing sensitivity (PTS) or temporary change in hearing sensitivity (TTS) for dredging and vessels is less than 100m for all marine mammal species. With exception of 200m TTS effect range for harbour porpoise.

92. Taking into account the small potential effect ranges, distances of the aggregate extraction and dredging projects from the offshore project area, the potential for contribution to cumulative effects is very small. Therefore, risk of PTS or TTS for all marine mammal species from aggregate extraction and dredging has been screened out from further consideration in the CEA.

93. All aggregate extraction and dredging projects are considered to be part of the existing baseline environment if operational prior to the start of the baseline surveys for North Falls in March 2019. Out of the initial list of 75 projects, 69 were initially screened out as being operational prior to March 2019. The six

remaining aggregate projects are distributed across four different aggregate areas.

94. The results of the screening aggregate extraction and dredging projects is presented in Table 1.7.

Table 1.7 CEA screening for UK aggregate and dredging projects within the relevant spatial areas and potential to overlap with North Falls construction [HP = harbour porpoise, MW = minke whale, GS = grey seal, HS = harbour seal, Y = Yes, N = No]

Name of Project	Area Number	Project Owner	Project status	Licence start date	Licence end date	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Area 1 South	478	DEME Building Materials Ltd	Production	Dec-12	Apr-24	Y	N	N
Colbart	530	Westminster Gravels Ltd	Exploration & Option area	Aug-17	Jul-22	Y	N	N
Cross Sands	242 -361/1-3	HAML	Production	Jan-15	Dec-29	Y	N	N
East Orford Ness	1809	Volker Dredging Ltd	Exploration & Option area	Sep-19	Aug-24	Y	N	N
EEC 1 (former 503)	529	Sea Aggregates Ltd	Exploration & Option area	Aug-17	Jul-22	Y	N	N
EEC 5 South	1806	Hanson Aggregates Marine Ltd	Exploration & Option area	Sep-19	Aug-24	Y	N	N
EEC 5 South	1807	Volker Dredging Ltd	Exploration & Option area	Sep-19	Aug-24	Y	N	N
EEC North	474/1	HAML	Expired	Jul-09	Nov-21	Y	N	N
EEC North	474/2	HAML	Expired	Jul-09	Nov-21	Y	N	N
EEC North	474/3	HAML	Expired	Jul-09	Nov-21	Y	N	N
Goodwin Sands	521	Dover Harbour Board	Production	Oct-18	Dec-22	Y	N	N
Greenwich Light East	473/1	CUML	Production	Nv-21	Nv-36	N	Y	Y
Greenwich Light East	473/2	CUML	Production	Nv-21	Nv-36	N	Y	Y

Name of Project	Area Number	Project Owner	Project status	Licence start date	Licence end date	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Greenwich Light East	473/2	Hanson Aggregates Marine Ltd	Production Agreement Area	Nv-21	Nv-36	N	Y	Y
Greenwich Light East	473/1	Hanson Aggregates Marine Ltd	Production Agreement Area	Nv-21	Nv-36	N	Y	Y
Humber 1	514/1	CUML	Production	Jan-15	Dec-29	Y	N	N
Humber 2	514/2	CUML	Production	Jan-15	Dec-29	Y	N	N
Humber 3	514/3	CUML	Production	Jan-15	Dec-29	Y	N	N
Humber 3	484	DEME Building Materials Ltd	Production	Jan-16	Dec-29	Y	N	N
Humber 4	514/4	CUML	Production	Jan-15	Dec-29	Y	N	N
Humber 4 and 7	506	DEME Building Materials Ltd	Production	Apr-17	Mar-32	Y	N	N
Humber 5	483	DEME Building Materials Ltd	Production	Apr-18	Mar-33	Y	N	N
Humber Estuary	106/1	HAML	Production	Jan-15	Dec-29	Y	N	N
Humber Estuary	106/2	HAML	Production	Jan-15	Dec-29	Y	N	N
Humber Estuary	106/3	HAML	Production	Jan-15	Dec-29	Y	N	N
Humber Estuary	400	HAML	Production	Jan-15	Dec-29	Y	N	N

Name of Project	Area Number	Project Owner	Project status	Licence start date	Licence end date	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Humber Overfalls	493	TML	Production	Jan-17	Dec-31	Y	N	N
Inner Dowsing	1805	Hanson Aggregates Marine Ltd	Exploration and Option Area	Sep-19	Aug-24	Y	N	N
Inner Dowsing	481/1-2	TML	Production	Dec-12	Oct-24	Y	N	N
Inner Dowsing	481/1-2	Van Oord Ltd	Production	Dec-12	Oct-24	Y	N	N
Inner Owers	435/1-2	HAML	Production	Jul-15	Jul-30	Y	N	N
Inner Owers	396/1-2	TML	Production	Apr-17	Jul-30	Y	N	N
Inner Owers North	488	TML	Production	Apr-17	Jul-30	Y	N	N
Longsand	508	Britannia Aggregates Ltd	Production	Apr-14	Mar-29	Y	N	N
Longsand	509/1-3	Tarmac Marine Ltd	Production	Jun-15	Jun-30	Y	N	N
Longsand	510/1-2	CUML	Production	Jun-15	Jun-30	Y	N	N
Lowestoft	511, 512, 513/1&2	CUML	Production	Jan-15	Dec-29	Y	N	N
Lowestoft Extension	1804	CUML	Exploration & Option area	Sep-19	Aug-24	Y	N	N
Median Deep	461	Volker Dredging Ltd	Production	Sep-21	Sep-36	N	Y	Y
Needles Isle of Wight	137	CUML	Production	Jan-15	Dec-29	Y	N	N
North Cross Sands	494	TML	Production	Jan-17	Dec-31	Y	N	N

Name of Project	Area Number	Project Owner	Project status	Licence start date	Licence end date	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
North Falls East	501	Westminster Gravels Ltd	Production	Jul-17	Jun-32	Y	N	N
North Inner Gabbard	498	Britannia Aggregates Ltd (BAL)	Production	Jan-15	Jan-30	Y	N	N
North Inner Gabbard	498	Volker Dredging Ltd / CUML	Production	Jan-15	Jan-30	Y	N	N
Off Great Yarmouth	228	Volker Dredging Ltd (VDL)	Production	Jan-15	Dec-29	Y	N	N
Off Great Yarmouth	254	TML	Production	Oct-18	Sep-33	Y	N	N
Off Great Yarmouth Extension	240	HAML	Production	Jan-15	Dec-29	Y	N	N
Off Saltfleet	197	TML	Production	Jan-15	Dec-29	Y	N	N
Off Selsey Bill	395/1-2	TML	Production	Mar-13	Mar-28	Y	N	N
Off Selsey Bill	395/1-2	Aggregate Industries UK Ltd	Production	Mar-13	Mar-28	Y	N	N
Outer Dowsing	515/1-2	Westminster Gravels Ltd	Production	Jan-15	Dec-29	Y	N	N
Outer OTE	528/2	HAML	Exploration & Option area	Aug-17	Jul-22	Y	N	N
Owers Extension	453	CUML	Production	Apr-17	Mar-32	Y	N	N

Name of Project	Area Number	Project Owner	Project status	Licence start date	Licence end date	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Shipwash	507/1-6	CEMEX UK Marine Ltd (CUML)	Production	Oct-16	Sep-31	Y	N	N
South-East Isle of Wight	340	Volker Dredging Ltd / CUML	Production	Jan-15	Dec-29	Y	N	N
South-East Isle of Wight	351	Volker Dredging Ltd / CUML	Production	Jan-15	Dec-29	Y	N	N
South-East Isle of Wight	340	CUML	Production	Jan-15	Dec-29	Y	N	N
South-East Isle of Wight	351	TML	Production	Jan-15	Dec-29	Y	N	N
South Hastings	460	CUML	Production	Jan-13	Jan-28	Y	N	N
South Hastings	460	HAML	Production	Jan-13	Jan-28	Y	N	N
South Hastings	460	TML	Production	Jan-13	Jan-28	Y	N	N
South of Needles Channel	500/3	HAML	Production	Apr-17	Mar-32	Y	N	N
South-West Isle of Wight	127	TML	Production	Jan-15	Dec-29	Y	N	N
South-West Isle of Wight	500/4	TML	Production	Apr-17	Mar-32	Y	N	N
South-Wight	500/1-2	TML	Production	Apr-17	Mar-32	Y	N	N

Name of Project	Area Number	Project Owner	Project status	Licence start date	Licence end date	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Screened into CEA?
Southwold East	430	CUML	Production	Dec-12	Nv-25	Y	N	N
Southwold East	430	TML	Production	Dec-12	Nv-25	Y	N	N
St Catherine's	407	CUML	Production	Mar-13	Mar-28	Y	N	N
St Catherine's	451	Westminster Gravels Ltd	Production	Apr-13	Mar-28	Y	N	N
Thames D	524		Production	2015	2037	Y	Y	N
West Bassurelle	458 & 464	CUML	Production	Dec-12	Sep-22	Y	N	N
West Bassurelle	458 & 464	TML	Production	Dec-12	Sep-22	Y	N	N
West Bassurelle Extension	1803	CUML	Exploration & Option area	Sep-19	Aug-24	Y	N	N
West Wight	522	CUML	Production	Sep-21	Sep-36	N	Y	Y
Yarmouth	401/2A	HAML	Production	Jan-15	Dec-29	Y	N	N

1.5.6 Licensed disposal sites

95. All UK licensed disposal sites are considered to be part of the existing baseline environment as were all operational prior to the start of the baseline surveys in March 2019. Therefore, all UK licensed disposal sites have been screened out from further consideration in the CEA.

96. The results of the CEA screening for UK licensed disposal sites are presented in Table 1.8.

Table 1.8 CEA screening for UK disposal sites [HP = harbour porpoise, MW = minke whale, GS = grey seal, HS = harbour seal, Y = Yes, N = No]

Project	Site code	Status	Spatial screening area				Screened into CEA?
			HP	MW	GS	HS	
Aberystwyth South Beach	IS013	Open	N	Y	N	N	N
Anstruther	FO101 (onshore)	Open	N	N	N	N	N
Sutors	CR019	Open	Y	Y	N	N	N
Inverness	CR027	Open	Y	Y	N	N	N
Burghead	CR030	Open	Y	Y	N	N	N
Lossiemouth Harbour	CR034	Open	N	Y	N	N	N
Buckie	CR040	Open	Y	Y	N	N	N
Banff Harbour	CR048	Open	Y	Y	N	N	N
Macduff	CR050	Open	Y	Y	N	N	N
Fraserburgh	CR060	Open	Y	Y	N	N	N
Peterhead Harbour	CR071	Open	Y	Y	N	N	N
North Buchan Ness	CR080	Open	Y	Y	Y	N	N
Aberdeen	CR110	Open	Y	Y	Y	N	N
Nairn	CR121	Open	Y	Y	N	N	N
Lochboisdale	CR160	Open	Y	Y	N	N	N
Balnapaling	CR170	Open	Y	Y	N	N	N
River Brora	CR180	Open	Y	Y	N	N	N
Dover	DV010	Open	Y	Y	Y	Y	N
Dover – emergency site	DV011	Open	Y	Y	Y	Y	N
Lydd Ranges	DV031	Open	Y	Y	Y	Y	N
Eastbourne	DV040	Open	Y	Y	Y	Y	N
Eastbourne Frontage	DV046	Open	Y	Y	Y	Y	N

Project	Site code	Status	Spatial screening area				Screened into CEA?
			HP	MW	GS	HS	
Montrose	FO010	Open	Y	Y	N	N	N
Arbroath	FO020	Open	Y	Y	N	N	N
Middle Bank (tay)	FO028	Open	Y	Y	N	N	N
Narrow Deep B	FO038	Open	Y	Y	N	N	N
Oxcars main	FO041	Open	Y	Y	N	N	N
Oxcars ext a	FO042	Open	Y	Y	N	N	N
Oxcars ext b	FO043	Open	Y	Y	N	N	N
Bo'ness	FO044	Open	Y	Y	N	N	N
Methil	FO048	Open	Y	Y	N	N	N
River Carron	FO053	Open	Y	Y	N	N	N
Granton	FO054	Open	Y	Y	N	N	N
Kinness Burn	FO055	Open	Y	Y	N	N	N
Water of Girvan	FO056	Open	Y	Y	N	N	N
Maidens	FO057	Open	Y	Y	N	N	N
St Monans	FO058	Open	Y	Y	Y	Y	N
Eyemouth	FO080	Open	Y	Y	Y	Y	N
Anstruther	FO101 (onshore)	Open	N	N	N	N	N
Bridlington a	HU015	Open	Y	Y	Y	Y	N
Humber 4b/hook	HU020	Open	Y	Y	Y	Y	N
Humber 4b/hook extension	HU021	Open	Y	Y	Y	Y	N
Humber 4	HU030	Open	Y	Y	Y	Y	N
East Halton	HU035	Open	Y	Y	Y	Y	N
Whitgift Bight (river ouse)	HU040	Open	Y	Y	Y	Y	N

Project	Site code	Status	Spatial screening area				Screened into CEA?
			HP	MW	GS	HS	
Goole Reach	HU041	Open	Y	Y	Y	Y	N
Keadby Station	HU044	Open	Y	Y	Y	Y	N
Holme Channel Deep	HU056	Open	Y	Y	Y	Y	N
Humber 3a	HU060	Open	Y	Y	Y	Y	N
Humber 1a	HU080	Open	Y	Y	Y	Y	N
Sunk Dredge Channel Window C	HU083	Open	Y	Y	Y	Y	N
Humber 2	HU090	Open	Y	Y	Y	Y	N
Bull sand fort extension	HU109	Open	Y	Y	Y	Y	N
Race Bank OWF	HU126	Open	Y	Y	Y	Y	N
Boston Deep	HU128	Open	Y	Y	Y	Y	N
West Stones	HU143	Open	Y	Y	Y	Y	N
Great Yarmouth	HU150	Open	Y	Y	Y	Y	N
Wells Outer Harbour Site A	HU152	Open	N	Y	N	N	N
Wells Outer Harbour Site C	HU154	Open	N	Y	N	N	N
Well Beneficial Use Site2	HU156	Open	N	Y	N	N	N
Wells Outer Harbour B1	HU157	Open	N	Y	N	N	N
Reedham Marina	HU159	Open	Y	Y	Y	Y	N
Boston 7	HU170	Open	Y	Y	Y	Y	N
Cross sands 2	HU176	Open	Y	Y	Y	Y	N
Hornsea Disposal Area 1	HU205	Open	Y	Y	Y	Y	N
Burgh Castle Yacht Station	HU208	Open	Y	Y	Y	Y	N
EAOW3	HU212	Open	Y	Y	Y	Y	N
Norfolk Vanguard ECC 1	HU213	Open	Y	Y	Y	Y	N

Project	Site code	Status	Spatial screening area				Screened into CEA?
			HP	MW	GS	HS	
Norfolk Vanguard ECC 2	HU214	Open	Y	Y	Y	Y	N
Norfolk Vanguard East	HU215	Open	Y	Y	Y	Y	N
Norfolk Vanguard West	HU216	Open	Y	Y	Y	Y	N
Norfolk Boreas Array	HU217	Open	Y	Y	Y	Y	N
Iceni Disposal 1	HU218	Open	Y	Y	Y	Y	N
Iceni Disposal 2	HU219	Open	Y	Y	Y	Y	N
Iceni Disposal 3	HU220	Open	Y	Y	Y	Y	N
Iceni Disposal 4	HU221	Open	Y	Y	Y	Y	N
Iceni Disposal 5	HU222	Open	Y	Y	Y	Y	N
NeuConnect North Site	HU224	Open	Y	Y	Y	Y	N
Aberystwyth South Beach	IS013	Open	N	Y	N	N	N
Dolau Beach	IS014	Open	N	Y	N	N	N
Newquay Track	IS015	Open	N	Y	N	N	N
Spending Harbour	IS016	Open	N	Y	N	N	N
South Beach	IS017	Open	N	Y	N	N	N
Shell Lagoon, Llanbedr	IS018	Open	N	Y	N	N	N
Degabwy Beneficial Use	IS035	Open	N	Y	N	N	N
Holyhead North	IS043	Open	N	Y	N	N	N
Conmy Beneficial Use	IS065	Open	N	Y	N	N	N
CONWY BENEFICIAL USE	IS066	Open	N	Y	N	N	N
Broughton	IS099	Open	N	Y	N	N	N
MOSTYN DEEP (MAINTENANCE)	IS102	Open	N	Y	N	N	N
Mostyn Breakwater	IS103	Open	N	Y	N	N	N

Project	Site code	Status	Spatial screening area				Screened into CEA?
			HP	MW	GS	HS	
Mersey (Garston Site)	IS110	Open	N	Y	N	N	N
Mersey (Mid-river Site)	IS120	Open	N	Y	N	N	N
Canning Half Tide	IS126	Open	N	Y	N	N	N
MERSEY (Liverpool Marina)	IS129	Open	N	Y	N	N	N
Burbo Bank Extension OWF	IS135	Open	N	Y	N	N	N
SITE Z	IS140	Open	N	Y	N	N	N
SITE Y	IS150	Open	N	Y	N	N	N
East Lytham	IS163	Open	N	Y	N	N	N
MORECAMBE BAY: LUNE DEEP	IS170	Open	N	Y	N	N	N
Lune River B	IS192	Open	N	Y	N	N	N
MORECAMBE BAY B	IS200	Open	N	Y	N	N	N
Barrow D	IS205	Open	N	Y	N	N	N
SOLWAY FIRTH	IS240	Open	N	Y	N	N	N
WORKINGTON ANCHORAGE	IS241	Open	N	Y	N	N	N
SILLOTH B	IS251	Open	N	Y	N	N	N
West Balnapaling	IS320	Open	N	Y	N	N	N
Douglas (I.O.M)	IS400	Open	N	Y	N	N	N
PEEL (I.O.M)	IS420	Open	N	Y	N	N	N
Douglas Harbour (I.O.M)	IS445	Open	N	Y	N	N	N
Belfast Dredgings C	IS591	Open	N	Y	N	N	N
PORTAVOGIE	IS620	Open	N	Y	N	N	N
Kilkeel	IS650	Open	N	Y	N	N	N
WARRENPOINT B	IS671	Open	N	Y	N	N	N

Project	Site code	Status	Spatial screening area				Screened into CEA?
			HP	MW	GS	HS	
Foul Ground	JE001	Open	N	Y	N	N	N
Grouville Bay	JE002	Open	N	N	N	N	N
PADSTOW BAY	LU010	Open	N	Y	N	N	N
WATCHET HARBOUR	LU055	Open	N	Y	N	N	N
Clevedon Lake	LU068	Open	N	Y	N	N	N
PORTISHEAD	LU070	Open	N	Y	N	N	N
Avonmouth (Inner)	LU080	Open	N	Y	N	N	N
ROYAL PORTBURY PIER	LU084	Open	N	Y	N	N	N
ROYAL EDWARD ENTRANCE	LU085	Open	N	Y	N	N	N
Cardiff Grounds	LU110	Open	N	Y	N	N	N
Merkur Buoy	LU115	Open	N	Y	N	N	N
SWANSEA BAY (OUTER)	LU130	Open	N	Y	N	N	N
NEWPORT	LU140	Open	N	Y	N	N	N
Milford Haven 2	LU168	Open	N	Y	N	N	N
Milford Haven 3	LU169	Open	N	Y	N	N	N
NEYLAND (OFF MILFORD HAVEN)	LU190	Open	N	Y	N	N	N
Weston Foreshore 3	LU193	Open	N	Y	N	N	N
Kirkcudbright	MA01	Open	N	Y	N	N	N
NORTH CHANONEL, SCOTLAND	MA010	Open	N	Y	N	N	N
Kirkcudbright	MA012	Open	N	Y	N	N	N
ROTHESAY BAY	MA016	Open	N	Y	N	N	N
Cloch Point	MA021	Open	N	Y	N	N	N
Girvan	MA025	Open	N	Y	N	N	N

Project	Site code	Status	Spatial screening area				Screened into CEA?
			HP	MW	GS	HS	
PORT ELLEN	MA030	Open	N	Y	N	N	N
Ayr Bay	MA050	Open	N	Y	N	N	N
Lossiemouth	MA090	Open	N	Y	N	N	N
River Dee	MA110	Open	N	Y	N	N	N
RAME HEAD SOUTH	PL031	Open	N	Y	N	N	N
Plymouth Deep	PL035	Open	N	Y	N	N	N
Lantic Bay	PL060	Open	N	Y	N	N	N
Truro	PL069	Open	N	Y	N	N	N
Falmouth Bay (B)	PL075	Open	N	Y	N	N	N
MOUNTS BAY	PL100	Open	N	Y	N	N	N
Seaton	PO026	Open	N	Y	N	N	N
LYME BAY 2	PO050	Open	N	Y	N	N	N
SPREY POINT	PO070	Open	N	Y	N	N	N
Deep Water Relocation	PO111	Open	N	Y	N	N	N
Portland Harbour Deep Water Relocation	PO112	Open	N	Y	N	N	N
St.Aubins	PO501	Open	N	Y	N	N	N
St Bredlades Bay	PO503	Open	N	Y	N	N	N
Greve dâ€™Azette	PO504	Open	N	Y	N	N	N
Lowestoft circular north	TH005	Open	Y	Y	Y	Y	N
Lowestoft marina temporary disposal site	TH011	Open	Y	Y	Y	Y	N
East Anglia One	TH023	Open	Y	Y	Y	Y	N
Harwich Haven	TH027	Open	Y	Y	Y	Y	N

Project	Site code	Status	Spatial screening area				Screened into CEA?
			HP	MW	GS	HS	
Orwell Yacht Club	TH032	Open	Y	Y	Y	Y	N
River orwell (ABP)	TH034	Open	Y	Y	Y	Y	N
Inner gabbard	TH052	Open	Y	Y	Y	Y	N
Inner gabbard east	TH056	Open	Y	Y	Y	Y	N
Galloper OWF	TH057	Open	Y	Y	Y	Y	N
Northey Island	TH058	Open	Y	Y	Y	Y	N
NeuConnect Disposal Site 1	TH059	Open	Y	Y	Y	Y	N
Maldon Saltings 3	TH064	Open	Y	Y	Y	Y	N
NeuConnect Disposal Site 2	TH067	Open	Y	Y	Y	Y	N
NeuConnect South Site	TH068	Open	Y	Y	Y	Y	N
NeuConnect Lower Mid Site	TH069	Open	Y	Y	Y	Y	N
South falls	TH070	Open	Y	Y	Y	Y	N
Whitstable c	TH073	Open	Y	Y	Y	Y	N
NeuConnect Upper Mid Site	TH074	Open	Y	Y	Y	Y	N
Mercator Disposal	TH081	Open	Y	Y	Y	Y	N
Putney Embankment	TH096	Open	Y	Y	Y	Y	N
Tilbury Tunnel outfall	TH099	Open	Y	Y	Y	Y	N
Pegwell Bay	TH140	Open	Y	Y	Y	Y	N
Nemo Disposal site A	TH150	Open	Y	Y	Y	Y	N
Nemo Disposal site B	TH151	Open	Y	Y	Y	Y	N
TEOW Disposal Site 1	TH153	Open	Y	Y	Y	Y	N
TEOW Disposal Site 2	TH154	Open	Y	Y	Y	Y	N
TEOW Disposal Site 3	TH155	Open	Y	Y	Y	Y	N

Project	Site code	Status	Spatial screening area				Screened into CEA?
			HP	MW	GS	HS	
Gridlink East Site	TH156	Open	Y	Y	Y	Y	N
Gridlink West Site	TH157	Open	Y	Y	Y	Y	N
Copperas	TH216	Open	Y	Y	Y	Y	N
Erwarton Track	TH217	Open	Y	Y	Y	Y	N
Orwell West Track	TH218	Open	Y	Y	Y	Y	N
Orwell East Track	TH219	Open	Y	Y	Y	Y	N
EA One Route EC-1	TH220	Open	Y	Y	Y	Y	N
EA One Route EC-2	TH221	Open	Y	Y	Y	Y	N
EA One Route EC-3	TH222	Open	Y	Y	Y	Y	N
EA One Route EC-4	TH223	Open	Y	Y	Y	Y	N
EA One Route EC-5	TH224	Open	Y	Y	Y	Y	N
Levington Site 1	TH225	Open	Y	Y	Y	Y	N
Levington Site 2	TH226	Open	Y	Y	Y	Y	N
Levington Site 3	TH227	Open	Y	Y	Y	Y	N
Levington Site 4	TH228	Open	Y	Y	Y	Y	N
Wrabness Beach East	TH229	Open	Y	Y	Y	Y	N
Horsey	TH230	Open	Y	Y	Y	Y	N
Blyth A&B	TY042	Open	Y	Y	N	N	N
Blyth OWF Demo	TY043	Open	Y	Y	N	N	N
North Tyne	TY070	Open	Y	Y	N	N	N
Souter Point (outer)	TY081	Open	Y	Y	N	N	N
Sunderland	TY090	Open	Y	Y	N	N	N
Noses Point	TY130	Open	Y	Y	N	N	N

Project	Site code	Status	Spatial screening area				Screened into CEA?
			HP	MW	GS	HS	
Tees Bay C	TY150	Open	Y	Y	N	N	N
Tees Upriver	TY157	Open	Y	Y	N	N	N
Teesport dock and Tees Container Terminal	TY158	Open	Y	Y	N	N	N
Tees Bay A	TY160	Open	Y	Y	N	N	N
Whitby	TY180	Open	Y	Y	N	N	N
Cleveland Potash Outfall	TY181	Open	Y	Y	N	N	N
Scarborough Rock	TY190	Open	Y	Y	N	N	N
Newhaven	underground coal gasification	Open	Y	Y	N	N	N
Brighton/ Rottingdean	underground coal gasification	Open	Y	Y	N	N	N
Emerald Quay, R Adur	underground coal gasification	Open	Y	Y	N	N	N
Shoreham	underground coal gasification	Open	Y	Y	N	N	N
Birdham Pool Marina	underground coal gasification	Open	Y	Y	N	N	N
Treloar hole	underground coal gasification	Open	Y	Y	N	N	N
Aquind cable Site A	underground coal gasification	Open	Y	Y	N	N	N

Project	Site code	Status	Spatial screening area				Screened into CEA?
			HP	MW	GS	HS	
Aquind cable Site B	underground coal gasification	Open	Y	Y	N	N	N
Nab Tower	underground coal gasification	Open	Y	Y	N	N	N
Langstone Harbour	underground coal gasification	Open	Y	Y	N	N	N
Island Marina	underground coal gasification	Open	Y	Y	N	N	N
Newtown Harbour	underground coal gasification	Open	Y	Y	N	N	N
Ryde harbour	underground coal gasification	Open	Y	Y	N	N	N
Hill Head	WI010	Open	Y	Y	N	N	N
River Hamble site 1	WI020	Open	Y	Y	N	N	N
River Hamble site 2	WI029	Open	Y	Y	N	N	N
Marchwood Shiplift Disposal Area	WI031	Open	Y	Y	N	N	N
Hurst fort	WI042	Open	Y	Y	N	N	N
Ventnor harbour	WI046	Open	Y	Y	N	N	N
Needles	WI048	Open	Y	Y	N	N	N
Swanage bay	WI049	Open	N	Y	N	N	N
Brownsea experimental	WI060	Open	N	Y	N	N	N
Rampion OWF	WI063	Open	Y	Y	N	N	N

1.5.7 Subsea cables and pipelines

97. Subsea cables and pipelines only have the potential for cumulative impact with North Falls during their construction. Plans or projects initially considered for the CEA screening were Tier 1-6 projects, where relevant.

98. All of the Tier 1 projects identified during screening were already installed and are therefore considered part of the baseline and have been screened out from further consideration in the CEA.

99. Of the subsea cables and pipelines for which information was currently available, 101 of the 102 projects were screened out from further consideration in the CEA.

100. Two projects have the potential for an overlap in construction programmes with that of North Falls, and therefore will be assessed further.

101. For the remaining projects being considered there is currently no information on possible construction dates and the potential to overlap with construction in the offshore project area.

102. As indicated in underwater noise modelling in ES Appendix 12.4 (Document Reference: 3.3.9), the underwater noise that could be generated during the seabed preparation, ploughing / jetting / pre-trenching or cutting for installation of cables / pipelines, rock dumping for protection of the cable / pipelines, and installation vessels, would be restricted to the area of installation (less than 100m), with the exception of TTS in harbour porpoise during rock placement (1km) and suction dredging (200m). Any effects would be temporary.

103. As a precautionary approach, disturbance caused from North Falls and one subsea cabling project has been included in the CEA.

104. The results of the CEA screening for subsea cables and pipelines are presented in Table 1.9.

Table 1.9 CEA screening for subsea cables and pipelines [HP = harbour porpoise, MW = minke whale, GS = grey seal, HS = harbour seal, Y = Yes, N = No]

Name of project	Tier	Landfall point 1	Landfall point 2	Spatial screening area				Potential for overlap of cable construction with North Falls construction?
				HP	MW	GS	HS	
Balgzand to Bacton	1	Bacton, UK	Balgzand, NL	Y	Y	Y	Y	N
BritNed	1	Isle of Grain, UK	Rotterdam, Netherlands	Y	Y	Y	Y	N
Caithness Moray	1	Noss Head	Tannachy	Y	Y	N	N	N
Carradale - Arran 1	1	UK	UK	N	Y	N	N	N
Carradale - Arran 2	1	UK	UK	N	Y	N	N	N
Clift Sound	1	UK	UK	Y	Y	N	N	N
Cromarty Firth	1	UK	UK	Y	Y	Y	Y	N
Dagebull - Langeness	1	Dagebull, Germany	Langeness, Germany	Y	Y	N	N	N
Dagebull - Oland	1	Dagebull, Germany	Oland, Germany	Y	Y	N	N	N
East West	1	RoI		N	Y	N	N	N
Eday - Sanday	1	UK	UK	Y	Y	N	N	N
Eday - Westray	1	UK	UK	Y	Y	N	N	N
ElecLink	1	Folkestone	Les Mandarins, France	Y	Y	Y	Y	N
Emmelsull - Horsbull - Fohr	1	Emmelsull-Horsebull, Germany	Fohr, Germany	Y	Y	N	N	N
EWIC	1			Unknown	Unknown	Unknown	Unknown	N
Fohr - Amrum	1	Fohr, Germany	Amrum, Germany	Y	Y	N	N	N
Harlingen-Vlieland	1	Netherlands	Netherlands	Y	Y	Y	Y	N
Helgoland	1	Helgoland, Germany	Sankt Peter-Ordning, Germany	Y	Y	N	N	N

Name of project	Tier	Landfall point 1	Landfall point 2	Spatial screening area				Potential for overlap of cable construction with North Falls construction?
				HP	MW	GS	HS	
Hoy - Flotta	1	UK	UK	Y	Y	N	N	N
Hoy - Orkney Mainland (centre)	1	UK	UK	Y	Y	N	N	N
Hoy - Orkney Mainland (north)	1	UK	UK	Y	Y	N	N	N
Hoy - Orkney Mainland (south)	1	UK	UK	Y	Y	N	N	N
IFA	1	UK	France	Y	Y	Y	Y	N
IFA2	1	UK	France	Y	Y	Y	Y	N
Interconnexion France-Angleterre 2000	1	Sangatte, France	Folkestone, UK	Y	Y	Y	Y	N
IUK Interconnector	1	UK	Belgium	Y	Y	Y	Y	N
Lerwick - Bressay 1	1	UK	UK	Y	Y	N	N	N
Lerwick - Bressay 2	1	UK	UK	Y	Y	N	N	N
Little Belt	1	Denmark	Denmark	Y	Y	N	N	N
Luutmoorsiel - Nrdstrandischmoor	1	Luttmoorsiel	Nrdstrandischmoor	Y	Y	N	N	N
Moffat to RoI	1	Moffatt, UK	RoI	N	Y	N	N	N
Mongstad-Kollsnes	1	Norway	Norway	Y	Y	N	N	N
Mossbank - Yell North	1	UK	UK	Y	Y	N	N	N
Mossbank - Yell South	1	UK	UK	Y	Y	N	N	N
Moyle	1	Northern Ireland		N	Y	N	N	N
Nemo Link	1	Pegwell Bay	Zeebruge	Y	Y	Y	Y	N
Nordstrand - Pellworm	1	Nordstrand, Germany	Pellworm, Germany	Y	Y	N	N	N
Nrdstrandischmoor - Pellworm	1	Nrdstrandischmoor, Germany	Pellworm, Germany	Y	Y	N	N	N

Name of project	Tier	Landfall point 1	Landfall point 2	Spatial screening area				Potential for overlap of cable construction with North Falls construction?
				HP	MW	GS	HS	
NorNed	1	Freda, Norway	Eemshaven	Y	Y	Y	Y	N
North Ness - South Ness	1	UK	UK	Y	Y	N	N	N
North Sea Link	1	Hylsfjorden, Norway	Blyth, UK	Y	Y	Y	N	N
Oland - Langeness	1	Oland, Germany	Langeness, Germany	Y	Y	N	N	N
Oresund replacement	1	Kristinelundveien	Denmark	Y	Y	N	N	N
Orkney - Graemsay	1	UK	UK	Y	Y	N	N	N
Orkney - Rousay	1	UK	UK	Y	Y	N	N	N
Orkney - Shapinsay	1	UK	UK	Y	Y	N	N	N
Orkney AC Link	1	Thruso, UK	Orkney, UK	Y	Y	N	N	N
Oscarsborg - Drobak	1	Oscarsbord, Denmark	Drobak, Denmark	N	Y	N	N	N
Pellworm - Hooge	1	Pellworm, Germany	Hooge, Germany	Y	Y	N	N	N
Rossie Island - Ferryden	1	UK	UK	Y	Y	N	N	N
Rousay - Egilsay	1	UK	UK	Y	Y	N	N	N
Rousay - Westray	1	UK	UK	Y	Y	N	N	N
Rousay - Wyre	1	UK	UK	Y	Y	N	N	N
Sanday - North Ronaldsay	1	Germany	Germany	Y	Y	N	N	N
Schluttsiel - Grode	1	Ockholm, Germany	Grode, Germany	Y	Y	N	N	N
Shapinsay - Stronsay	1	UK	UK	Y	Y	N	N	N
Shetland - Papa Stour	1	UK	UK	Y	Y	N	N	N
Shetland - West Linga	1	UK	UK	Y	Y	N	N	N
Shetland - Whalsay	1	UK	UK	Y	Y	N	N	N

Name of project	Tier	Landfall point 1	Landfall point 2	Spatial screening area				Potential for overlap of cable construction with North Falls construction?
				HP	MW	GS	HS	
Skagerrak 1 and 2	1	Kristiansand, Norway	Tjele, Denmark	Y	Y	N	N	N
Skagerrak 3	1	Kristiansand, Norway	Tjele, Denmark	Y	Y	N	N	N
Skagerrak 4	1	Kristiansand, Norway	Bulbjerg, Denmark	Y	Y	N	N	N
Stronsay - Sanday	1	UK	UK	Y	Y	N	N	N
VikingLink Corridor	1	Lincolnshire Coast, UK	Southern Jutland, Denmark	Y	Y	Y	Y	N
Weisdale Voe	1			Y	Y	N	N	N
West Linga - Whalsay	1	UK	UK	Y	Y	N	N	N
Westray - Papa Westray	1	UK	UK	Y	Y	N	N	N
Whalsay - Out Skerries	1	UK	UK	Y	Y	N	N	N
Yell - Fetlar 1	1	UK	UK	Y	Y	N	N	N
Yell - Fetlar 2	1	UK	UK	Y	Y	N	N	N
Yell - Unst 1	1	UK	UK	Y	Y	N	N	N
Yell - Unst 2	1	UK	UK	Y	Y	N	N	N
COBRAcable	2	Eemshaven, Netherlands	Endrup, 6740, Denmark	Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
Interconnexion France-Angleterre 2	2	Merville, France	Monks Hill Beach, UK	Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
Mainland Orkney-Hoy (North) Replacement Cable	2	Hoy, Orkney, UK	Mainland UK	Y	Y	N	N	N - assume construction completed prior to NF construction commencing
Nordlink	2	Büsum, Germany	Ertsmyra, Norway	Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
PL2236 - MIMAS TO SATURN	1	N/A Block 48/9a		Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing

Name of project	Tier	Landfall point 1	Landfall point 2	Spatial screening area				Potential for overlap of cable construction with North Falls construction?
				HP	MW	GS	HS	
PL2237 - SATURN TO MIMAS	1	N/A Block 48/10a and 48/10b		Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
PL2894 - KATY TO KELVIN GAS EXPORT PIPELINE	1	N/A Blocks 44/18, 44/19b and 44/23		Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
PL2895 - KELVIN TO KATY METHANOL PIPELINE	1	N/A Blocks 44/18, 44/19b and 44/23		Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
PL3086 - CYGNUS A TO CYGNUS B GAS PIPELINE	1	N/A Blocks 44/11a and 44/12a		Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
PL3088 - CYGNUS TO ETS GAS PIPELINE	1	N/A Blocks 44/11a and 44/12a		Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
PL3121 - JULIET TO PICKERILL A GAS PIPELINE	1	N/A, Block 48/11		Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
PLU3122 - JULIET TO PICKERILL A UMBILICAL	1	N/A, Block 48/11		Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
Pentland Firth East	2	Hoy, UK	Mainland UK	Y	Y	N	N	N - assume construction completed prior to NF construction commencing
Shetland HVDC Link Interconnector	2	Noss Head, UK	Weisdale Voe (Shetland), UK	Y	Y	N	N	N - assume construction completed prior to NF construction commencing
Eastern Green Link 1 (EGL1) Interconnector	3	Newcastle, UK	Dunbar, UK	Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
Eastern Green Link 2 (EGL2) Interconnector	3	Peterhead, UK	Drax, UK	Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
FAB Link	3	UK	France	Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
Greenlink	3	UK	RoI	N	Y	N	N	N - assume construction completed prior to NF construction commencing

Name of project	Tier	Landfall point 1	Landfall point 2	Spatial screening area				Potential for overlap of cable construction with North Falls construction?
				HP	MW	GS	HS	
NeuConnect Interconnector	3	UK	Germany	Y	Y	Y	Y	N - assume construction completed prior to NF construction commencing
Orkney Caithness Interconnector	3	Billia Croo, Orkney, UK	UK mainland	Y	Y	N	N	N - assume construction completed prior to NF construction commencing
Rosebank FPSO (Electrification)	3	Rosebank FPSO	UK	Y	Y	N	N	N - assume construction completed prior to NF construction commencing
Spittal to Peterhead	3	Spittal, UK	Peterhead, UK	Y	Y	N	N	N - assume construction completed prior to NF construction commencing
Atlantic Super Connection	4	UK	Iceland	Y	Y	N	N	Unknown, but possible
Carradale - Arran 1 replacement	4	UK	UK	N	Y	N	N	Unknown, but possible
Gridlink	4	Kingsnorth, UK	Dunkerque, France	Y	Y	Y	Y	Unknown, but possible
Nautilus Interconnector	4	Suffolk, UK	Belgium	Y	Y	Y	Y	Unknown, but possible
NorthConnect	4	Peterhead, UK	Simadalen, Norway	Y	Y	Y	N	Unknown, but possible
Continental Link	5	Holderness Coast, UK		Y	Y	Y	Y	Unknown, but possible
Sea Link	5	Sizewell offshore, UK	Kent, UK	Y	Y	Y	Y	**Y**
Tarchon Energy Interconnector	6	UK	Germany	Y	Y	Y	Y	Unknown, but possible

1.5.8 Unexploded ordnance clearance

105. As outlined in Section 1.2.1, the potential risk of PTS in marine mammals from cumulative effects has been screened out from further consideration in the CEA. As if there is the potential for any PTS, suitable mitigation would be put in place to reduce any risk to marine mammals.

106. The potential for cumulative disturbance effects from UXO clearance at other projects during construction of North Falls has been screened in to the CEA.

107. Mitigation measures for UXO clearance include the use of low-order clearance techniques, which could include a small donor charge, rather than full high-order detonation.

108. It is therefore highly unlikely that more than one UXO high-order detonation would occur at exactly the same time or on the same day as another UXO detonation, even if they had overlapping UXO clearance operation durations. The CEA is therefore based on potential for disturbance from one UXO high-order detonation without mitigation (worst-case), and one low-order detonation. In 2021 there were 6 cases of UXO detonations reported to the MNR in the North Sea, these occurred over a total of 16 days. This amount gives an average of less than one UXO detonation to occur within a year at any one time in the North Sea, therefore the scenarios used within the CEA is highly precautionary.

109. UXO clearance in the offshore project area will be assessed as part of a separate Marine Licence. The assessment prior to any UXO clearance will be based on the latest information for the types, size, number, location and latest UXO clearance methods and mitigation measures, including cumulative effects during UXO clearance for North Falls. Therefore, UXO clearance for North Falls are not included in this CEA, while the potential for UXO clearance from another project being undertaken at the same time as North Falls construction has been considered.

1.5.9 Other industries

1.5.9.1 Gas storage

110. For gas storage projects, there are two within the relevant species areas; one of which was cancelled (Deborah), and one of which has been decommissioned (Rough). Therefore, gas storage projects have been **screened out** from further consideration in the CEA.

1.5.9.2 Offshore mines

111. Offshore mining projects considered for the CEA screening were Tier 1-5 UK based projects. No European projects were considered due to a lack of information on project locations, phases, and programmes. Two UK mining projects were identified, both of which are currently operational. These considered part of the current baseline and therefore not considered further in the CEA.

112. Therefore, offshore mining projects have been **screened out** from further consideration in the CEA.

1.5.9.3 Carbon capture projects

113. Carbon capture projects considered in the CEA screening were Tier 1-5 for UK based projects. All European projects were screened out due to a lack of information on project locations, phases, and programmes. No projects were identified in Tier 2 or 3, and all of the Tier 1 projects identified by screening were already active and are therefore considered part of the baseline.

114. For the Tier 4 and 5 projects, all are expected to be operational by the time construction starts for North Falls.

115. Carbon capture projects are unlikely to contribute significantly to any potential cumulative impacts for underwater noise, as most construction work will be on land and use existing offshore infrastructure. Therefore, all carbon capture projects have been **screened out** of the CEA.

116. The results of the CEA screening for gas storage, offshore mines and carbon capture projects are presented in Table 1.10.

Table 1.10 CEA screening for other industries (gas storage, offshore mines and carbon capture projects) within the relevant spatial areas and with the potential to overlap with North Falls construction [HP = harbour porpoise, MW = minke whale, GS = grey seal, HS = harbour seal, Y = Yes, N = No]

Project	Type of project	Status of project	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Spatial Area				Screened into CEA?
					HP	MW	GS	HS	
Gas storage projects									
Deborah	Gas Storage	Cancelled	N - operational	N	Y	Y	Y	Y	N
Rough	Gas Storage	Decommissioned	N - operational	N	Y	Y	Y	Y	N
Offshore mines									
Hundale Potash Mine	Offshore mines	Operational	Y	N	Y	Y	N	N	N
Boulby Potash Mine	Offshore mines	Operational	Y	N	Y	Y	N	N	N
Carbon capture projects									
Endurance	Carbon capture	Operational by 2025	N	N	Y	Y	Y	Y	N
Hewett Depleted Gas	Carbon capture	Operational by 2028	N	Y	Y	Y	Y	Y	N
Goldeneye	Carbon capture	Operational by 2021	N	N	Y	Y	N	N	N
Acorn Carbon Capture and Storage	Carbon capture	Operational by 2025	N	N	Y	Y	N	N	N
Bunoter Closure 36	Carbon capture	Early development	N	N	Y	Y	Y	Y	N
Captain X	Carbon capture	Early development	N	N	Y	Y	N	N	N
CS001	Carbon capture	OUT OF ROUND	N	Unknown	Y	Y	Y	Y	N

Project	Type of project	Status of project	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Spatial Area				Screened into CEA?
					HP	MW	GS	HS	
CS003	Carbon capture	OUT OF ROUND	N	Unknown	Y	Y	N	N	N
CS006	Carbon capture	OUT OF ROUND	N	Unknown	Y	Y	Y	Y	N
CS007	Carbon capture	OUT OF ROUND	N	Unknown	Y	Y	N	Y	N
CS008	Carbon capture	Licence accepted	N	Unknown	Y	Y	Y	Y	N
CS009	Carbon capture	Licence accepted	N	Unknown	Y	Y	Y	Y	N
CS010	Carbon capture	Licence accepted	N	Unknown	no	Y	N	N	N
CS011	Carbon capture	Licence accepted	N	Unknown	Y	Y	N	N	N
CS012	Carbon capture	Licence accepted	N	Unknown	Y	Y	N	N	N
CS013	Carbon capture	Licence accepted	N	Unknown	Y	Y	N	N	N
CS014	Carbon capture	Licence accepted	N	Unknown	Y	Y	N	N	N
CS015	Carbon capture	Licence accepted	N	Unknown	Y	Y	N	N	N
CS016	Carbon capture	Licence accepted	N	Unknown	Y	Y	N	N	N
CS017	Carbon capture	Licence accepted	N	Unknown	Y	Y	Y	Y	N
CS018	Carbon capture	Licence accepted	N	Unknown	Y	Y	Y	Y	N

Project	Type of project	Status of project	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Spatial Area				Screened into CEA?
					HP	MW	GS	HS	
CS019	Carbon capture	Licence accepted	N	Unknown	Y	Y	Y	Y	N
CS020	Carbon capture	Licence accepted	N	Unknown	Y	Y	Y	Y	N
CS021	Carbon capture	Licence accepted	N	Unknown	Y	Y	Y	Y	N
CS022	Carbon capture	Licence accepted	N	Unknown	Y	Y	Y	Y	N
CS023	Carbon capture	Licence accepted	N	Unknown	Y	Y	N	N	N
CS024	Carbon capture	Licence accepted	N	Unknown	Y	Y	N	N	N
CS025	Carbon capture	Licence accepted	N	Unknown	Y	Y	Y	Y	N
CS026	Carbon capture	Licence accepted	N	Unknown	Y	Y	Y	Y	N
CS027	Carbon capture	Licence accepted	N	Unknown	Y	Y	Y	Y	N
CS028	Carbon capture	Licence accepted	N	Unknown	Y	Y	Y	Y	N
Dartagnan	Carbon capture	In Planning	N	N	Y	Y	N	N	N
DMX Demonstration in Dunkirk	Carbon capture	Pilot	N	N	Y	Y	N	N	N
Eemshaven	Carbon capture	Cancelled/Dormant	N	N	Y	Y	N	N	N
Endurance	Carbon capture	Agreement for Lease	N	N	Y	Y	Y	Y	N

Project	Type of project	Status of project	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Spatial Area				Screened into CEA?
					HP	MW	GS	HS	
Esbjerg Pilot Plant	Carbon capture	Finished	N	N	Y	Y	N	N	N
Forties 5 Site 1	Carbon capture	Early development	N	Y	Y	Y	N	N	N
Karsto	Carbon capture	Cancelled/Dormant	N	N	-	-	-	-	N
Killingholme	Carbon capture	Operational	N	N	Y	Y	N	Y	N
Northern Lights	Carbon capture	Under Construction	N	N	Y	Y	N	N	N
Nuon Magnum	Carbon capture	In Planning	N	N	Y	Y	N	N	N
Peterhead Low Carbon CCGT Power Station Project	Carbon capture	Cancelled/Dormant	N	N	-	-	-	-	N
Project Bifrost	Carbon capture	In Planning	N	N	Y	Y	N	N	N
Project Greensand	Carbon capture	Pilot	N	N	Y	Y	N	N	N
Sargas Husnes	Carbon capture	Cancelled/Dormant	N	N	-	-	-	-	N
Sleipner	Carbon capture	Operational	N	N	Y	Y	N	N	N
Technology Centre Mongstad	Carbon capture	Pilot	N	N	Y	Y	N	N	N
Wilhelmshaven Pilot Plant	Carbon capture	Pilot	N	N	Y	Y	N	N	N

Project	Type of project	Status of project	Operational prior to North Falls surveys?	Potential for overlap with North Falls construction?	Spatial Area				Screened into CEA?
					HP	MW	GS	HS	
Viking A	Carbon capture	Early development	N	Y	Y	Y	Y	Y	N
Hamilton	Carbon capture	Early development	N	N	N	Y	N	N	N
Zero Carbon Humber (ZCH)	Carbon capture	In Design	N	N	Y	Y	N	Y	N

1.5.10 Coastal developments

117. Coastal development projects include those such as ports, harbours, and coastal defence schemes. UK coastal development projects were considered if they were in Tier 1 – 5, and no European coastal development projects were considered due to a lack of information.

118. Within the UK, all coastal development projects on the east coast of England were screened, and those with the potential for activities to take place after the start of the North Falls baseline surveys (in March 2019), or those with applications submitted but not yet approved, were considered further. All coastal developments that were completed prior to March 2019 are considered to be part of the baseline.

119. Table 1.11 provides the screening results for coastal developments. Eleven of these projects have the potential to overlap with the construction of North Falls, however, all of these are for minor maintenance activities, and as such are not expected to result in any significant effect to any marine mammal species (as discussed in Section 1.4.1.3). Therefore, all coastal development projects have been screened out of further assessment within the CEA.

Table 1.11 CEA screening for coastal developments (such as ports, harbour, coastal defence schemes) with the potential to overlap with North Falls construction [Y = Yes, N = No]

Project	Marine Licence number	Status	Marine Licence dates	Activity start date	Activity end date	Type of project / activity	Potential for overlap with North Falls construction?
Stag Brewery, Mortlake	EIA/2023/00045	Approved	Unknown	2023	2029	Residential development	No
Great Yarmouth Southern Termina;	EIA/2023/00037	Approved	Unknown	-	-	New port terminal	No
HMNB Portsmouth No. 6 Dock	EIA/2023/00044	Approved	Unknown	-	-	Coastal defence	No
East Cowes Terminal Project	EIA/2023/00048	Approved	Unknown	2025	2028	Redevelop existing port infrastructure	No
Colne Quay	EIA/2023/00010	Approved	Unknown	-	-	Residential development	No
Jenkins Lane River Wall	EIA/2023/00012	Approved	Unknown	-	-	Residential development	No
Lowestoft Eastern Energy Facility Project Variation	EIA/2023/00020	Approved	Unknown	-	-	Dredging	No
Sea Wall repairs at Shotley Marina	EIA/2023/00041	Approved	Unknown	-	-	Coastal defence	No
Ipswich Haven Marina	EIA/2023/00033/1	Approved	Unknown	-	-	Marina renewal	No
Port of Felixstowe, Dooley Terminal - Upgrade to RORO 3 & 4	L/2019/00285/1	Approved	Aug 19 to Jan 21	May-19	Mar-20	Berth extension	No
Foulness Island - X5-Headway Refurbishment	L/2021/00153/1	Approved	Apr 21 to Apr 22	-	-	Coastal defence	No
Happisburgh to Winterton Sea Defences	MLA/2015/00313/1	Approved	Sep 15 to Aug 20	-	-	Coastal defence	No

Project	Marine Licence number	Status	Marine Licence dates	Activity start date	Activity end date	Type of project / activity	Potential for overlap with North Falls construction?
Headland and Block Sands Coastal Protection Scheme	MLA/2014/00567	Approved	Apr 15 to Oct 20	-	-	Coastal defence	No
Hythe Ranges Coastal Protection Works	L/2020/00192/2	Approved	Jul 20 to Dec 21	Mar-20	Nov-20	Coastal defence	No
Potters leisure sea defence	MLA/2016/00328	Approved	Unknown	2016	-	Coastal defence	No
South Withernsea Coastal Defences	MLA/2019/00069	Approved	Dec 19 to Dec 24	-	-	Coastal defence	No
Installation of Blyth Bay Marker buoys	MLA/2015/00230	Approved	Jul 15 to Jun 26	-	-	Construction	No
Marsden Lifeguard Station and Redwell Steps	MLA/2019/00129	Approved	Aug 19 to Dec 21	-	-	Construction	No
Withernsea Long Sea Outfall Replacement Environmental Impact Assessment (EIA)	MLA/2019/00066/1	Approved	Apr 20 to Apr 21	-	-	Construction outfall	No
Naze north cliff stabilisation emergency works project	L/2022/00157/1	Approved	Apr 22 to Apr 23	Jun-22	Sep-22	Emergency works	No
Cromer Pier	MLA/2022/00279	Approved	Jul 22 to Jul 23	-	-	Minor maintenance	No
Gorleston Beach Lifeguard Area	MLA/2017/00041/2	Approved	May 17 to May 27	-	-	Minor maintenance	Yes
Happisburgh Marine License	MLA/2018/00136	Approved	Jul 18 to Jul 28	-	-	Minor maintenance	**Yes**
Lindisfarne causeway ditching	MLA/2017/00530	Approved	Apr 18 to Dec 28	-	-	Minor maintenance	**Yes**
NDDC	MLA/2018/00137/1	Approved	Jul 18 to Jul 28	-	-	Minor maintenance	**Yes**

Project	Marine Licence number	Status	Marine Licence dates	Activity start date	Activity end date	Type of project / activity	Potential for overlap with North Falls construction?
RNLI North Division - Regional Licence for Low Impact Maintenance Works	MLA/2017/00202	Approved	Sep 17 to Sep 27	-	-	Minor maintenance	Yes
RNLI Whitley Bay Beach Lifeguard Area	MLA/2017/00202	Approved	Sep 17 to Sep 27	-	-	Minor maintenance	Yes
SABIC 3 Jetty Maintenance	MLA/2022/00232	Approved	May 22 to May 23	-	-	Minor maintenance	No
Sealife Hunstanton	MLA/2022/00312	Approved	Jul 22 to Jul 23	-	-	Minor maintenance	No
Southend Pier - Maintenance	L/2022/00246/1	Approved	Jul 22 to Jun 32	-	-	Minor maintenance	**Yes**
Southern Water minor maintenance works	L/2021/00217/1	Approved	Sep 21 to Sep 31	-	-	Minor maintenance	**Yes**
Yorkshire Water Services - Long term maintenance and repair marine licence	MLA/2016/00417/1	Approved	Jun 17 to Jun 27	-	-	Minor maintenance	Yes
Footprint of new lifeboat station and access route for construction	MLA/2020/00389	Approved	Mar 21 to Jun 23	-	-	New lifeboat station	No
RNLI Wells	MLA/2017/00499/2	Approved	Sep 18 to Jul 21	-	-	New lifeboat station	No
BLF (includes outer bar), MBIF and CDO investigations	MLA/2019/00029/4	Approved	May 19 to Dec 23	-	-	NPP - offshore works	No
Walton Pier Concrete Repair Programme 2019	L/2019/00163/1	Approved	Apr 19 to Apr 20	-	-	Pier repairs	No
Trawl Dock Area Lowestoft Outer Harbour	MLA/2020/00166	Approved	Aug 20 to Aug 22	-	-	Pontoon extension	No
Marina pontoon maintenance and upgrade.	MLA/2019/00521	Approved	Aug 20 to Aug 29	2020	2023	Pontoon maintenance and upgrade	No

Project	Marine Licence number	Status	Marine Licence dates	Activity start date	Activity end date	Type of project / activity	Potential for overlap with North Falls construction?
Northern Gateway Container Terminal	MLA/2020/00079	Approved	Feb 22 to Dec 29	Target completion date of 7th May 2028		Port construction	No - assume given target completion date, works will be complete prior to NF
Berth 9 Container Yard, Port of Felixstowe	L/2017/00150/4	Approved	Aug 17 to Aug 19	Sep-17	Nov-18	Port expansion	No
Hamilton Dock	MLA/2016/00482/2	Approved	Mar 13 to Dec 19	-	-	Port expansion	No
Teesport Ro-Ro No.2 Linkspan Replacement Works	MLA/2021/00215/1	Approved	Oct 21 to Oct 24	-	-	Port replacement	No
Kessingland Works Area	MLA/2020/00457/1	Approved	Feb 21 to Feb 22	-	-	Removal of structures	No
Tees Seagrass Project	MLA/2021/00191	Approved	May 22 to Apr 24	-	-	Seagrass project	No
Seaweed and Mussel aquaculture off the Yorkshire Coast	MLA/2017/00386/1	Approved	Mar 18 to Mar 23	-	-	Seaweed farm	No
Hemsby rock berm scheme	MLA/2021/00465	Submitted	N/A	Unknown (30-week programme)		Coastal defence	No - assume given short construction programme and submission date of ML
Project_Rissa_A_LB_Location	MLA/2022/00287	Submitted	N/A	2022	Feb-23	Habitat creation for birds	No
Stonehill Wall Rock Revetment Extension	MLA/2022/00289	Submitted	N/A	2022	2023	Revetment extension	No
Hopton Groyne 6	-	-	Aug-17-20	-	-	-	No
hopton on sea , norfolk	-	-	Nov-14-Oct 20	-	-	-	No

Project	Marine Licence number	Status	Marine Licence dates	Activity start date	Activity end date	Type of project / activity	Potential for overlap with North Falls construction?
Like for like repairs of Coastguard Cottages sea defence at Cuckmere Haven	-	-	Sep-22-23	-	-	-	No
Naze north cliff stabilisation emergency works project	-	-	Apr-22-23	Jul-21	Aug-21	-	No
Quay Lane Boatyard - Retaining Wall	-	-	Sep-22-24	-	-	-	No
Scaffolding works at Fort Cumberland coastal defence	-	-	Dec-21-22	-	-	-	No
Scheme of Maintenance for existing coastal defence at Dolphin Boathouse, Wootton Bridge, IW (northern frontage)	-	-	-	Jul-21	Aug-21	-	No
Shoeburyness Seawall Repair Works	-	-	Apr-18-Jun 18	Jul-05	Jul-05	-	No
South Beach - H2/4 Bay	-	-	Nov-12-13	-	-	-	No
Great Yarmouth - New Flood Defence Quay Wall	-	-	May-22-23	-	-	-	No
Walton on the Naze Sea defence work	MLA/2021/00317/1	-	-	-	-	-	No
Port of Sheerness RoRo	-	completed	20 July 2023-Dec 24	-	-	-	No
Port of Felixstowe, Dooley Terminal - Upgrade to RORO 3 & 4	-	completed	Aug-19 – Jan 21	May-19	-	-	No
Berth 9 Container Yard, Port of Felixstowe	-	completed	Aug-17- Aug 19	Sep-17	Nov-18	-	No
Hamilton Dock, Lowestoft	-	completed	Mar-13- Dec 19	-	-	-	No

Project	Marine Licence number	Status	Marine Licence dates	Activity start date	Activity end date	Type of project / activity	Potential for overlap with North Falls construction?
Little Oakley managed realignment	-	-	N/A	N/A	N/A	-	No
Marchwood Port Development	-	-	n/a	n/a	n/a	-	No
Northern Gateway Container Terminal	-	-	Feb-22- Dec 29	-	TBC by 7th May 2028	-	Yes
Riverside Ro-Ro Tees estuary	-	-	n/a	n/a	n/a	-	No

1.5.11 Shipping

120. Shipping is considered to part of the baseline environment. All shipping has been screened out from further consideration in the CEA.

1.5.12 Commercial fisheries

121. Commercial fisheries are scoped out of the CEA, as it is an ongoing activity that is considered to part of the baseline environment. Further detail on the reasoning for this decision has been provided below.

122. Commercial fisheries within the North Sea and underwater noise associated with fishing vessels, have the potential to cause a cumulative impact on marine mammals, through both the direct effect of by-catch and the indirect effect through the loss of marine mammal prey species (from commercial fisheries), as well as disturbance due to underwater noise (from vessel presence).

123. By-catch as a result of commercial fisheries is recognised as a historic and continuing cause of harbour porpoise mortality in the southern North Sea and will therefore be a factor in shaping the size of the current North Sea MU population. The available prey resource for harbour porpoise has also been influenced by historic and continuing commercial fishing. Noise from vessels is also considered to be part of the baseline conditions.

124. This approach is in accordance with the Planning Inspectorate (2019) Advice Note 17 Cumulative Effects Assessment, which states that:

"*Where other projects are expected to be completed before construction of the proposed NSIP and the effects of those projects are fully determined, effects arising from them should be considered as part of the baseline*".

125. The potential for cumulative impacts associated with commercial fisheries within the Southern North Sea SAC has been considered in the RoC HRA (BEIS, 2020). With regard to effects to habitats, the RoC HRA states:

"*18.120 There have been no quantified assessments undertaken on the extent impacts from commercial fishing may have within the SAC and therefore information to inform this assessment is not available.*

18.122 Without knowing the extent of impact on the seabed arising from the fishing industry …it is not possible to undertake an in-combination assessment that addresses all the potential impacts on the habitats within the SAC."

126. With regard to direct effects on harbour porpoise, the RoC HRA (BEIS, 2020) also states that:

"*18.203 Commercial fishing has occurred within the SAC for many years and has had, and will continue to have, direct and indirect impacts on harbour porpoise, their habitat and prey within the SAC. As the conservation status of harbour porpoise in UK waters and the SAC is considered favourable (JNCC, 2019; JNCC and Natural England, 2019) current and historical levels of fishing in the SAC are not considered to have affected the conservation status of the species.*

18.210 There are no known plans to suggest that the level of fishing within the SAC will significantly increase over the period the consented wind farms are planned to be constructed, such that, it is predicted that the current level of impacts from fishing on harbour porpoise within the SAC will not increase."

127. Natural England's Deadline 4 Response to the Examining Authority's Further Written Questions and Requests for information for Hornsea Project 3 (15th January 2019) (page 46, Q 2.2.73) was that:

"*Where there is ongoing fishing activity in the site, it is important that the impacts of the activity are captured within the assessment in the context of the conservation objectives of the affected designated site(s). This assessment will likely take place as part of the baseline characterisation of the development area, however, as fishing activity is mobile, variable and subject to change, there may be instances whereby fishing impacts are not adequately captured in the baseline characterisation and therefore may need to be considered as part of the in-combination assessment. This could be due to a change in effort; change in management; or a change in legislation amongst other things, and fishery managers (i.e., Marine Management Organisation (MMO)) would be best placed to advise on this.*

In relation to the assessment of impacts on the SNS SAC, Natural England……. are not currently aware of anything that would have significantly altered the levels of fishing activity within the site; any current plans for new fisheries, or changes to existing fisheries that have not been captured, but we would look to fisheries managers to advise more definitively on these points."

128. This, along with the RoC HRA (BEIS, 2020), suggests that by-catch has not affected a population considered to be in Favourable Conservation Status (FCS), whilst Natural England acknowledge that there is currently no evidence to suggest that the current levels of fishing would significantly alter in the future.

129. Therefore, the potential effects from commercial fishing (including by-catch and loss of prey species) and from the underwater noise associated with vessels are considered to be a part of the environmental baseline for marine mammals of the North Sea, including for harbour porpoise, and are **screened out** of further assessment.

1.6 Summary of CEA screening

130. Table 1.12 summarises the impact screening for the CEA.

Table 1.12 Summary of cumulative effects screening

Impact	Potential for cumulative effect	Rationale
PTS from underwater noise	N	If there is the potential for any PTS, suitable mitigation would be put in place to reduce any risk to marine mammals. Therefore, the potential from cumulative impactive from PTS should be negligible.
TTS and disturbance from underwater noise	TTS: N Disturbance: Y	There is the potential for cumulative disturbance or TTS / fleeing response due to underwater noise. Disturbance ranges are the widest ranging underwater noise effects assessed, and therefore are used to inform the assessment as a worst-case. Potential TTS ranges have been used to inform the assessment where there is a lack of further relevant information for disturbance. Projects / activities with the potential for cumulative effects due to disturbance from underwater noise: • piling at OWFs • other construction activities at OWFs (other than piling) including vessels, cable installation works, dredging, seabed preparation and rock placement • geophysical surveys at OWFs • aggregate extraction and dredging for harbour porpoise • oil and gas seismic surveys • subsea cable and pipelines for harbour porpoise • UXO clearance
Barrier effects due to disturbance from offshore wind	Y	There is the potential for barrier effects from underwater noise associated with offshore wind.
Vessel collision risk	Y	There is the potential for increased vessel collision risk from cumulative projects.
Disturbance at seal haul-out sites	Y	There is the potential for disturbance at seal haul-out sites.
Changes to water quality	N	N significant effects due to water quality are expected from any projects or potential sources.
Changes to prey resource	Y	There is the potential for indirect cumulative effects to prey resources.

131. Table 1.13 summarises the activities, plans and projects screened into the CEA.

Table 1.13 Summary of activities, plans and projects screened into the CEA with the potential for a disturbance effect

Effect	Potential for Cumulative Impact	Projects
Disturbance from underwater noise	Piling at OWFs	The OWFs that could be piling at the same time as North Falls and screened into the CEA are: • Berwick Bank; • Dogger Bank South (East and West); • Dudgeon Extension; • Five Estuaries; • Outer Dowsing; and • Sheringham Shoal Extension.

Effect	Potential for Cumulative Impact	Projects
	Other construction activities at OWFs (other than piling) including vessels, cable installation works, dredging, seabed preparation and rock placement	The OWFs screened in for other construction activities that could have cumulative effects with other construction activities at North Falls are: • Dunkerque; • East Anglia Hub (East Anglia ONE North); • Galatea-Galene; • Hornsea Project Four; • Hornsea Project Three; • Nordlicht I; • Nordlicht II; • Nordsee Cluster A - N-3.7; • Nordsee Cluster A - N-3.8; • Norfolk Vanguard; • Rampion 2; and • West Of Orkney.
	Geophysical surveys	Unknown It is therefore assumed, as a worst-case scenario, that there could potentially be up to two geophysical surveys at OWFs in the North Sea at any one time, during construction of North Falls.
	Aggregate extraction and dredging	Six aggregates projects (over four different licenced areas) have the potential to be taking place at the same time as construction at North Falls: • Greenwich Light East (473/1; CUML) • Greenwich Light East (473/2; CUML) • Greenwich Light East (473/2; Hanson Aggregates Marine Ltd) • Greenwich Light East (473/1; Hanson Aggregates Marine Ltd) • Median Deep (461; Volker Dredging Ltd) • West Wight (522; CUML)
	Oil and gas installation projects	While oil and gas installation projects have the potential for a cumulative disturbance effect with North Falls, none have been screened in for further assessment.
	Oil and gas seismic surveys	Unknown It is therefore assumed, as a worst-case scenario, that there could be up to two seismic surveys in the North Sea at any one time, during construction of North Falls.
	Subsea cables and pipelines	One subsea cable and pipeline project has the potential for an overlap in construction with North Falls; • Sea Link
	UXO clearance	Unknown It is assumed UXO clearance would use low-order technique. However, as a worst-case scenario, CEA includes potential for one UXO high-order detonation and one low-order detonation (no mitigation) in the North Sea at the same time as piling at North Falls.
	Coastal developments	While coastal development projects have the potential for a cumulative disturbance effect with North Falls, none have been screened in for further assessment.

132. Table 1.14 summarises the activities and types of projects screened out of the CEA.

Table 1.14 Summary of activities and types of projects screened out of the CEA

Impact	Potential for cumulative Effect	Activities and types of projects screened out
Disturbance from underwater noise	No	The activities and types of projects screened out of the CEA, as there is no potential for significant contribution to underwater noise cumulative effects during North Falls construction, are: • Operational noise from OWFs • Maintenance of operational OWFs • Decommissioning of OWFs • MRE projects • Oil and gas decommissioning • Disposal sites • Gas storage, offshore mines and carbon capture • Coastal developments minor maintenance activities • Shipping • Commercial fisheries

1.7 References

BEIS (2020). Record of The Habitats Regulations Assessment Undertaken Under Regulation 65 of the Conservation of Habitats and Species (2017), and Regulation 33 of The Conservation of Offshore Marine Habitats and Species Regulations (2017). Review of Consented Offshore Wind Farms in the Southern North Sea Harbour Porpoise SAC.
Cheesman, S. (2016). Measurement of operational wind turbine noise in UK waters. In Popper A N, Hawkins A (eds) The Effects of Noise on Aquatic Life II. Advances in Experimental Medicine and Biology, Vol. 875, pp 153-160. DOI 10.1007/975-1-4939-2981-8_18.
Diederichs, A., Nehls, G., Dähne, M., Adler, S., Koschinski, S. and Verfuß, U. (2008). Methodologies for measuring and assessing potential changes in marine mammal behaviour, abundance or distribution arising from the construction, operation and decommissioning of offshore windfarms. Commissioned by COWRIE Ltd, 231.
JNCC (2010a). JNCC guidelines for minimising the risk of injury to marine mammals from using explosives. August 2010.
JNCC (2010b). Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise. August 2010.
JNCC (2017). JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys. April 2017.
JNCC (2019). Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019. Available at: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/#regularly-occurring-species-vertebrate-species-mammals-marine
JNCC and Natural England (2013). Suggested Tiers for Cumulative Impact Assessment.
JNCC and Natural England (2019). Harbour Porpoise (Phocoena phocoena) Special Area of Conservation: Southern North Sea Conservation Objectives and Advice on Operations. Advice under Regulation 21 of The Conservation of Offshore Marine Habitats and Species Regulation 2017 and Regulation 37(3) of the Conservation of Habitats and Species Regulations 2017. March 2019.
JNCC, Natural England and CCW (2010). Draft EPS Guidance - The protection of marine European Protected Species from injury and disturbance. Guidance for the marine area in England and Wales and the UK offshore marine area. Joint Nature Conservation Committee, Natural England and Countryside Council for Wales. October 2010.
MMO (2015). Modelled mapping of continuous underwater noise generated by activities. A report produced for the Marine Management Organisation, pp50. MMO Project N. 1097. ISBN 978-1-909452-87-9.
Pangerc, T., Robinson, S. and Theobald, E. (2016). Underwater sound measurement data during diamond wire cutting: First description of radiated noise. Proceedings of Meetings on Acoustic. Vol 27. Fourth International Conference on the Effects of Noise on Aquatic Life. Dublin, Ireland 10-16 July 2016.

Planning Inspectorate (2019). Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects. Version 2 August 2019. https://infrastructure.planninginspectorate.gov.uk/wp-conotent/uploads/2015/12/Advice-note-17V4.pdf

Robinson, S.P., Theobald, P.D., Hayman, G., Wang, L.S., Lepper, P.A., Humphrey, V. and Mumford, S. (2011). Measurement of underwater noise arising from marine aggregate dredging operations. Marine Aggregate Levy Sustainability Fund MEPF report 09/P108.

Tougaard, J., Henriksen, O.D. and Miller. L.A. (2009). Underwater noise from three types of offshore wind turbines: estimation of impact zones for harbour porpoise and harbour seals. Journal of the Acoustic Society of America 125(6): 3766.

Annex A: Cumulative population consequences of disturbance from pile driving at other projects

133. Population modelling has been conducted for harbour porpoise, minke whale, harbour seal and grey seal. The interim Population Consequences of Disturbance (iPCoD) framework (Harwood *et al*., 2014, King *et al*., 2015) has been used to estimate the potential medium- and long-term population consequences of the predicted amount of disturbance resulting from piling at North Falls and other OWFs. The full results of the iPCoD modelling can be found in the ES Chapter 12 Marine Mammals (Document Reference: 3.1.14).

Assumptions and limitations of iPCoD

134. There are three key assumptions and limitations of the iPCoD model; (i) the duration of the disturbance due to each exposure, (ii) density dependence is not accounted for due to a lack of scientific understanding, and (iii) the effects of environmental variation and demographic stochasticity on the population levels. Each of these is described in further detail below.

135. Despite the assumptions and limitations of the iPCoD model (as described below), this assessment has been carried out according to current best practice, using the best available scientific information, the latest expert elicitation results from Booth and Heinis (2018), and the latest demographic rates (Sinclair *et al*., 2020). The results of the modelling (as provided in ES Chapter 12 Marine Mammals (Document Reference: 3.1.14)) are therefore considered to be as accurate as possible, based on our current understanding of marine mammal species.

Duration of disturbance

136. Within the iPCoD model, unless there is sufficient scientific understanding to state otherwise, disturbance is defined as a period of time where no foraging or nursing is taking place, and it is assumed that exposure to underwater noise (e.g. from piling) results in this disturbance for that full day of when the exposure occurred. Therefore, the model assumes that on a day where disturbance occurs, a marine mammal has no intake of energy (Booth *et al*., 2019).

137. For harbour porpoise, the assumption is that (on average) this disturbance effect will last for six hours following exposure. For both seal species, it is assumed that the disturbance effect will last for much less than 24 hours, but there is not currently sufficient information to define that time period, and so 24 hours of disturbance remains the parameter used for seals (Booth *et al*., 2019). For minke whales, there is insufficient scientific understanding on the disturbance period, and therefore the iPCoD model still assumes 24 hours of non-foraging time.

138. Given the current understanding of marine mammal reactions to pile driving, this scenario of a 24-hour disturbance period appears unrealistic. For example, empirical evidence from constructed wind farms (e.g. Graham *et al.,* 2019; Brandt *et al..* 2011) suggests that the detection of animals returns to baseline levels in the hours following a disturbance from piling and therefore, for the most part, it can be assumed that the disturbance occurs only on the day (24 hours)

that piling takes place (at least in the case of harbour porpoise which was the focus of these studies).

139. A recent study estimated energetic costs associated with disturbance from sonar, where it was assumed that one hour of feeding cessation was classified as a mild response, two hours of feeding cessation was classified as a strong response and eight hours of feeding cessation was classified as an extreme response (Czapanskiy *et al.,* 2021). The presumption of a 24-hour feeding cessation for both seal species and minke whale therefore surpasses what is typically deemed an extreme response. Hence, it is regarded as unrealistic and likely to inflate the actual disturbance levels expected.

140. Despite these limitations and uncertainties, this assessment has been carried out according to best practice, using the best available scientific information, and the latest expert elicitation results from Sinclair *et al.* (2020). The information provided is therefore considered to be sufficient to carry out an adequate assessment for harbour porpoise, minke whale, grey seal, and harbour seal.

Density dependence

141. Another potential limitation of the iPCoD model is that no form of density dependence has been incorporated due to the uncertainties as to how this may occur. Density dependence refers to the change in demographic rates as a result of declines or increase in population sizes (i.e. prey / key habitat areas will increase in availability as population levels decline, and it can be assumed that this leads to an increase in fertility and survival within the remaining population (Harwood *et al.,* 2014).

142. There is currently insufficient scientific understanding on density dependence in marine mammal species to allow for it to be incorporated into the iPCoD model.

143. The limitations for assuming a simple linear ratio between the maximum net productivity level and carrying capacity have been highlighted by Taylor and Master (1993) as simple models demonstrate that density dependence is likely to involve several biological parameters which themselves have biological limits (e.g. fecundity and survival). For UK populations of harbour porpoise (and other marine mammal species) however, there is no published evidence for density dependence and therefore, density dependence assumptions are not currently included within the iPCoD protocol.

Environmental variation and demographic stochasticity

144. Environmental variation refers to the difference in demographic rates over different years as a result of changes in the environment. Environmental variation (changes from year to year) are included within the model in terms of variations in each species' survival and fertility rates.

145. Demographic stochasticity refers to the variation in the vital rates of individuals within the same population (Harwood *et al.,* 2014). In relation to the iPCoD model, demographic stochasticity would result in a difference in modelled population levels, even if all inputs remained the same (Harwood *et al.,* 2014);

"*Demographic stochasticity is caused by the fact that, even if survival and fertility rates are constant, the number of animals in a population that die and give birth will vary from year to year because of chance events…For example, two otherwise identical populations that experience exactly the same sequence of environmental conditions will follow slightly different trajectories over time. As a result, it is possible for a "lucky" population that experiences disturbance effects to increase, whereas an identical undisturbed but "unlucky" population may decrease*".

146. Demographic stochasticity has a greater effect on the dynamics of relatively small populations, and it is therefore included within modelling scenarios where the estimated population size is less than 3,000 individuals (Harwood *et al.,* 2014).

147. The iPCoD model attempts to model some of the sources of uncertainty inherent in the calculation of the potential effects of disturbance on marine mammal population. This includes demographic stochasticity and environmental variation. This can be seen in the outputs of the iPCoD model, where the un-impacted (or baseline) population shows varying levels of population increase and decline for each iteration. Plate 1.1 an example of the results of the iPCoD model (for harbour porpoise within the NS MU). Plate 1.1 shows that the results of all iterations range from a significant increase to a significant decrease in the population size; as this is the results of the modelling of an un-impacted (baseline) harbour porpoise population, the variation in results are solely as a result of both environmental variation and demographic stochasticity.

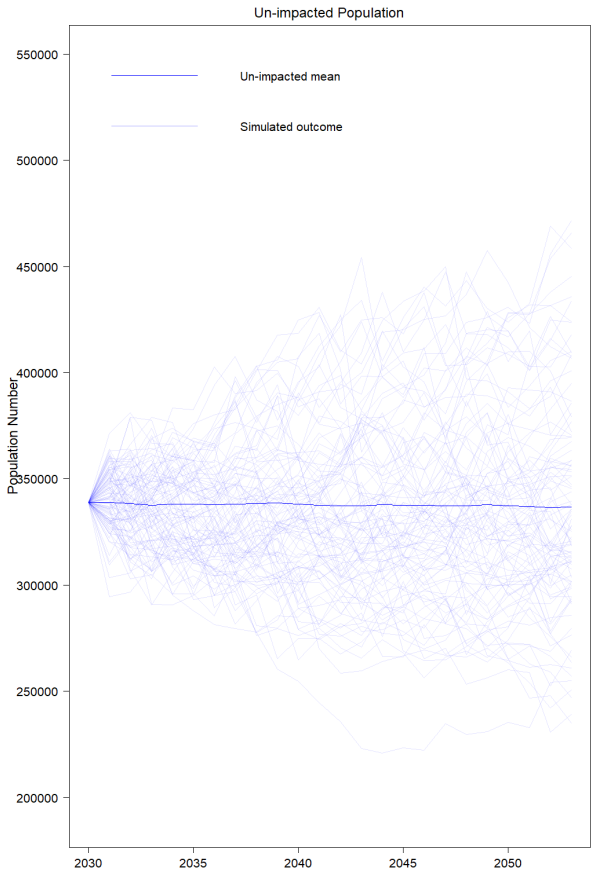

Plate 1.1 Modelled un-impacted (baseline) harbour porpoise NS MU population size over a 25 year period (dark blue line shows the mean population change over time, light blue lines show all the iterations of the modelling scenario, showing the variation in population increase or decrease solely due to environmental variation and demographic stochasticity)

Modelling parameter input for other OWFs

148. Within the iPCoD model, as it is based on one noisy event (in this case piling) resulting in a disturbance day, the worst-case construction programme would be that of one pile per day. Therefore, this assumption has been taken forward for all projects included within the population modelling.

149. The number of marine mammals that are at potential risk of PTS is taken from a single pile event, using cumulative sound exposure level (SEL_{cum}) for the worse-case location. This approach has been taken for all projects included within the population modelling.

150. For the OWFs screened in that may have overlapping pile driving with North Falls, a review of the available data has been undertaken. Project specific worst case pile driving, PTS and disturbance data has been incorporated for cumulative iPCoD modelling for other OWFs for each species. The number of individuals at risk of PTS or disturbance due to piling at other OWFs were taken from their own project specific reporting. Piling days were distributed at random within the stated piling schedules for each project.

151. Piling parameters assessed for other projects in the iPCoD modelling are set out in Table 1.15.

Table 1.15 Piling parameters for other OWFs included in the cumulative iPCoD modelling

Parameters	Project	Value
Number of piling days	North Falls foundation	57
	North Falls OSP	2
	Berwick Bank (Seagreen Charlie Delta Echo)	372
	Dogger Bank South (East and West)	108
	Dudgeon Extension	32
	Sheringham Shoal Extension	25
	Five Estuaries	81
	Outer Dowsing	100
Piling schedule	North Falls foundation	2030 – 2031
	North Falls OSP	2030 - 2031
	Berwick Bank (Seagreen Charlie Delta Echo)	2027 - 2032
	Dogger Bank South (East and West)	2028 - 2032
	Dudgeon Extension	2028 - 2030
	Sheringham Shoal Extension	2028 - 2030
	Five Estuaries	2029 - 2030
	Outer Dowsing	2027 - 2030

The number of individuals at risk of PTS and/or disturbance during piling at other OWFs used for the iPCoD modelling are presented in

Table 1.16 Number of individuals at risk of PTS or disturbance due to piling at OWFs included in the iPCoD modelling

OWF project	Number of individuals							
	Parameters for cumulative assessments (and relevant SACs)					Parameters for in-combination assessments (for seal SACs only)		
	Harbour porpoise	Minke whale	Grey seal	Harbour seal	Source	Grey seal associated with the Humber Estuary SAC	Harbour seal associated with The Wash and North Norfolk Coast SAC	Source
Number of individuals at risk of PTS								
North Falls	*70.7*	*1.4*	*0.02*	*0.01*	*ES Chapter 12 Marine Mammals (Document Reference: 3.1.14)*	*0.0005*	*0.0001*	*RIAA Part 3 Marine Mammals (Document Reference: 7.1.3)*
Berwick Bank (Seagreen Charlie Delta Echo)	<1	<1	Not screened in for grey seal	Not screened in for harbour seal	Based on single piling (Berwick Bank Wind Limited, 2022a)	Not assessed for this SAC	Not assessed for this SAC	(Berwick Bank Wind Limited, 2022b)
Dogger Bank South (East and West)	489	14	4	0.02	Based on a single pile at Dogger Bank South East and Dogger Bank South West in isolation (RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited, 2023)	3 (RIAA not available at time of writing, therefore, generic approach used to inform the assessment using 25km range)	0.02 (RIAA not available at time of writing, therefore, generic approach used to inform the assessment using 25km range)	RIAA not available at time of writing, therefore, generic approach used to inform the assessment using PTS ranges from PEIR (based on a single pile at DBS East and DBS West in isolation (RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited, 2023))

OWF project	Number of individuals							
	Parameters for cumulative assessments (and relevant SACs)					Parameters for in-combination assessments (for seal SACs only)		
	Harbour porpoise	Minke whale	Grey seal	Harbour seal	Source	Grey seal associated with the Humber Estuary SAC	Harbour seal associated with The Wash and North Norfolk Coast SAC	Source
								and Carter *et al*., 2022 densities
Dudgeon Extension	148	2	1	0.1	Based on single piling (Equinor New Energy, 2023)	1	0.1	Based on single piling (Equinor New Energy, 2023)
Sheringham Shoal Extension	27	1	0.4	0.2	Based on single piling (Equinor New Energy, 2023)	0.7	0.2	Based on single piling (Equinor New Energy, 2023)
Five Estuaries	237	Not assessed by project	1	1	Based on single piling (Five Estuaries Wind Farm Ltd, 2023)	1	1	Based on single piling (Five Estuaries Wind Farm Ltd, 2023)
Outer Dowsing	39	1	1	1	Based on single piling (Outer Dowsing Offshore Wind, 2023)	0	0	Based on single piling (Outer Dowsing Offshore Wind, 2023)
Number of individuals at risk of disturbance								
North Falls	*1,072*	*37*	*112*	*7*	*ES Chapter 12 Marine Mammals (Document Reference: 3.1.14)*	*9*	*0.1*	*RIAA Part 3 Marine Mammals (Document Reference: 7.1.3)*
Berwick Bank (Seagreen	1,754	82	Not screened	Not screened in for harbour seal	Based on single piling (Berwick	Not assessed for this SAC	Not assessed for this SAC	(Berwick Bank Wind Limited, 2022b)

OWF project	Number of individuals							
	Parameters for cumulative assessments (and relevant SACs)					Parameters for in-combination assessments (for seal SACs only)		
	Harbour porpoise	Minke whale	Grey seal	Harbour seal	Source	Grey seal associated with the Humber Estuary SAC	Harbour seal associated with The Wash and North Norfolk Coast SAC	Source
Charlie Delta Echo)			in for grey seal		Bank Wind Limited, 2022a)			
Dogger Bank South (East and West)	12,208	148	1,968	4	Based on a single pile at Dogger Bank South East and Dogger Bank South West in isolation (RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited, 2023)	346 (RIAA not available at time of writing, therefore, generic approach used to inform the assessment using 25km range)	2 (RIAA not available at time of writing, therefore, generic approach used to inform the assessment using 25km range)	RIAA not available at time of writing, therefore, generic approach used to inform the assessment using 25km range and SAC specific Carter *et al.*, 2022 densities
Dudgeon Extension	804	11	374	43	Based on single piling (Equinor New Energy, 2023)	166	31	Based on single piling (Equinor New Energy, 2023)
Sheringham Shoal Extension	582	11	338	84	Based on single piling (Equinor New Energy, 2022)	157	62	Based on single piling (Equinor New Energy, 2022)
Five Estuaries	7,031	Not assessed by project	112	2	Based on single piling (Five	168	3	Based on single piling (Five Estuaries Wind Farm Ltd, 2023)

OWF project	Number of individuals							
	Parameters for cumulative assessments (and relevant SACs)					Parameters for in-combination assessments (for seal SACs only)		
	Harbour porpoise	Minke whale	Grey seal	Harbour seal	Source	Grey seal associated with the Humber Estuary SAC	Harbour seal associated with The Wash and North Norfolk Coast SAC	Source
					Estuaries Wind Farm Ltd, 2023)			
Outer Dowsing	3,981	17	377	25	Based on single piling (Outer Dowsing Offshore Wind, 2023)	615	35	Based on single piling (Outer Dowsing Offshore Wind, 2023)

References

Berwick Bank Wind Limited. (2022a). Berwick Bank Wind Farm Environmental Impact Assessment Report Volume 2, Chapter 10: Marine Mammals. Available from: https://marine.gov.scot/sites/default/files/eor0764.pdf

Berwick Bank Wind Limited. (2022b). Berwick Bank Wind Farm Report to Inform Appropriate Assessment, Part Two: Special Areas of Conservation. Available from: https://marine.gov.scot/sites/default/files/eor0766_berwick_bank_wind_farm_-_riaa_-_part_2_-_sac_assessments.pdf

Booth, C.G, and Heinis, F. (2018). Updating the Interim PCoD Model: Workshop Report – New transfer functions for the effects of permanent threshold shifts on vital rates in marine mammal species. 2018. Report Code SMRUC-UOA-2018-006, submitted to the University of Aberdeen and Department for Business, Energy and Industrial Strategy (BEIS), June 2018 (unpublished).

Booth, C. G., F. Heinis, and Harwood. J (2019). Updating the Interim PCoD Model: Workshop Report - New transfer functions for the effects of disturbance on vital rates in marine mammal species. Report Code SMRUC-BEI-2018-011, submitted to the Department for Business, Energy and Industrial Strategy (BEIS), February 2019 (unpublished).

Brandt, M. J., Diederichs, A., Betke, K. and Nehls, G. (2011). Responses of harbour porpoises to pile driving at the Horns Rev II offshore wind farm in the Danish North Sea. Marine Ecology Progress Series, 421, 205-216.

Carter MID, Boehme L, Cronin MA, Duck CD, Grecian WJ, Hastie GD, Jessopp M, Matthiopoulos J, McConnell BJ, Miller DL, Morris CD, Moss SEW, Thompson D, Thompson PM and Russell DJF (2022) Sympatric Seals, Satellite Tracking and Protected Areas: Habitat-Based Distribution Estimates for Conservation and Management. Front. Mar. Sci. 9:875869.

Czapanskiy, M. F., M. S. Savoca, W. T. Gough, P. S. Segre, D. M. Wisniewska, D. E. Cade, and J. A. Goldbogen (2021). Modelling short-term energetic costs of sonar disturbance to cetaceans using high-resolution foraging data. Journal of Applied Ecology.

Equinor New Energy Ltd. (2023). Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects: Marine Mammals Technical Note and Addendum (Revision B) (Clean). Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010109/EN010109-002028-16.14%20Marine%20Mammals%20Technical%20Note%20and%20Addendum%20(Revision%20B)%20(Clean).pdf

Equinor New Energy Ltd. (2022). Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects Environmental Statement Volume 1 Chapter 10 - Marine Mammal Ecology. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010109/EN010109-000228-6.1.10%20Chapter%2010%20Marine%20Mammal%20Ecology.pdf

Five Estuaries Wind Farm Ltd. (2023). Five Estuaries Offshore Wind Farm Preliminary Environmental Information Report Volume 2, Chapter 7: Marine Mammal Ecology. Available from: [redacted]

Graham, I. M., Merchant, N. D., Farcas, A., Barton, T. R., Cheney, B., Bono, S., & Thompson, P. M. (2019). Harbour porpoise responses to pile-driving diminish over time. Royal Society Open Science, 6(6), 190335. [redacted]

Harwood, J., S. King, R. Schick, C. Donovan, and C. Booth. 2014. A Protocol For Implementing The Interim Population Consequences Of Disturbance (PCoD) Approach: Quantifying And Assessing The Effects Of UK Offshore Renewable Energy Developments On Marine Mammal Populations. Report Number SMRUL-TCE-2013- 014.

King, S. L., R. S. Schick, C. Donovan, C. G. Booth, M. Burgman, L. Thomas, and J. Harwood. 2015. An interim framework for assessing the population consequences of disturbance. Methods in Ecology and Evolution 6:1150-1158.

Outer Dowsing Offshore Wind (2023). Outer Dowsing Offshore Wind Preliminary Environmental Information Report Volume 1, Chapter 11: Marine Mammals. Available from: [redacted]

RWE Renewables UK Dogger Bank South (West) Limited & RWE Renewables UK Dogger Bank South (East) Limited. (2023). Dogger Bank South Offshore

Wind Farms Preliminary Environmental Information Report Chapter 11 – Marine Mammals. Available from: [redacted]

Sinclair, R. R., Sparling, C. E., and Harwood, J. (2020). Review Of Demographic Parameters and Sensitivity Analysis To Inform Inputs And Outputs Of Population Consequences Of Disturbance Assessments For Marine Mammals. Scottish Marine and Freshwater Science, 11(14), 74. https://doi.org/10.7489/12331-1.

Taylor, B. L., and Master, D. P. (1993). Implications of Non-Linear Density Dependence. Marine Mammal Science, 9(4), 360-371.