NORTH FALLS

Offshore Wind Farm

Outline Site Integrity Plan for the Southern North Sea Special Area of Conservation (Clean)

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Glossary of Acronyms

AA	Appropriate Assessment
AEOI	Adverse Effect on Integrity
DCO	Development Consent Order
DML	Deemed Marine Licence
EPS	European Protected Species
JNCC	Joint Nature and Conservation Committee
LAT	Lowest Astronomical Tide
NAS	Noise Abatement Systems
MMO	Marine Management Organisation
MMMP	Marine Mammal Mitigation Protocol
MU	Management Unit
NE	Natural England
RIAA	Report to Inform Appropriate Assessment
SAC	Special Area of Conservation
SIP	Site Integrity Plan
SNCB	Statutory Nature Conservation Bodies
SNS	Southern North Sea
WTG	Wind Turbine Generators

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 export cables come ashore at Kirby Brook.
Noise Abatement Systems	A secondary noise mitigation method aimed to reduce sound propagation during pile driving. Example methods include (but are not limited to) casings, resonators or bubble curtains (big and small bubble curtains).
Noise reduction measures	Noise reduction measures which use of primary and / or secondary noise reduction methods. Primary noise reduction methods aim to decrease noise emission at source, such as modifying the piling process. Secondary noise reduction methods aims to reduce sound propagation, such as the use of NAS.
Offshore cable corridor	The corridor of seabed from the 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 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).
Scour protection	Protective materials to avoid sediment being eroded away from the base of the wind turbine generator foundations and offshore substation platform foundations as a result of the flow of water.
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 Outline Site Integrity Plan for the Southern North Sea Special Area of Conservation

1.1 Introduction

1. This Outline Site Integrity Plan (SIP) for the Southern North Sea (SNS) Special Area of Conservation (SAC) is for the proposed North Falls Offshore Wind Farm (hereafter “North Falls” or “the Project”).
2. The Outline SIP for the SNS SAC sets out the approach to delivering measures for North Falls to avoid significant disturbance of harbour porpoise (*Phocoena phocoena*) during piling works which would lead to an Adverse Effect on Integrity (AEOI), in relation to the SNS SAC Conservation Objectives.
3. The SNS SAC was designated for harbour porpoise in February 2019. Harbour porpoise is the only listed feature of the site.
4. The SNS SAC has been recognised as an area with persistent high densities of harbour porpoise (Joint Nature and Conservation Committee (JNCC), 2017; JNCC and Natural England, 2019) and is the largest designated site for harbour porpoise in United Kingdom (UK) waters at the time of designation.

1.1.1 Purpose of this Document

5. The purpose of the Outline SIP is to set out the approach for North Falls Offshore Wind Farm Ltd (The Applicant) to deliver potential mitigation and management measures that may be required to avoid AEOI of the designated harbour porpoise feature of the SNS SAC. Figure 1.1 shows the SNS SAC in relation to North Falls.
6. The approach and measures in this Outline SIP are in relation to North Falls only and are in response to the conclusions of the draft Report to Inform Appropriate Assessment (RIAA) Part 3 Marine Mammals (Annex II species) (Document Reference: 7.1.3). The draft RIAA concludes that, subject to the final design of North Falls, and the actual in-combination scenario for offshore wind farm projects that could be constructing at the same time, further mitigation and management measures may be necessary in relation to the potential in-combination effects of underwater noise during pile driving in order to ensure there will be no AEOI on the designated harbour porpoise feature of the SNS SAC. This Outline SIP therefore sets out the approach of North Falls to provide certainty to the conclusions of the RIAA, and specifically that the conclusion of no AEOI on the SNS SAC remains valid.
7. Following completion of the Appropriate Assessment (AA) by the Competent Authority (Secretary of State for Energy Security & Net Zero), the mitigation and management measures secured in the final SIP at the pre-piling stage will be based on this Outline SIP and the conclusions of the AA as well as the final design of North Falls, and the potential in-combination effects of underwater noise during pile driving, in order to avoid AEOI on the designated feature of the SNS SAC.

8. In its final form, the SIP will include any updated information on management measures, advice or guidance for the SNS SAC and the final design of North Falls.

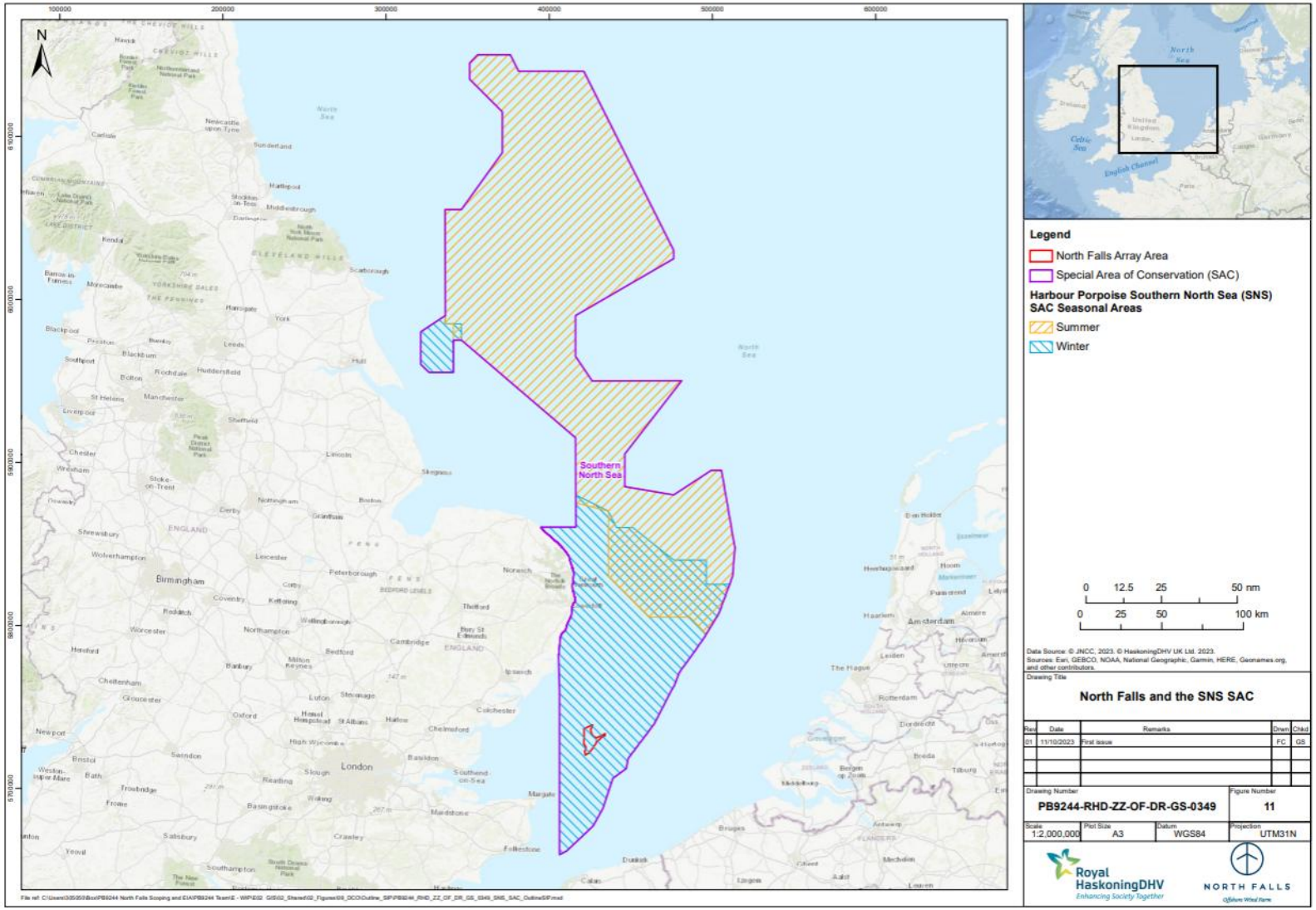

Figure 1.1 North Falls and the SNS SAC

1.1.2 Scope of the Document

9. The scope of this document covers the potential for any significant disturbance of harbour porpoise from underwater noise during piling at North Falls.

10. Any offshore unexploded ordnance (UXO) clearance required for North Falls will be consented and mitigation determined as part of a separate Marine Licence application at the pre-construction stage. Therefore, disturbance from underwater noise during UXO clearance at the North Falls site has not been included in this Outline SIP as it will not be authorised under the Development Consent Order (DCO) application for North Falls. The requirement for a SIP for the UXO clearance for North Falls would be confirmed through the separate UXO marine licencing process. If it is deemed a SIP is required to manage underwater noise relating to the North Falls UXO clearance campaign (either alone or in-combination), this would be provided as part of that separate process.

11. It should be noted that the final Marine Mammal Mitigation Protocol (MMMP) to be produced at the pre-construction stage in accordance with the outline MMMP (Document Reference: 7.7) will provide details of the mitigation requirements during pile driving at North Falls in relation to any physical or auditory injury to marine mammals, including harbour porpoise. In addition, any requirements to reduce disturbance in relation to European Protected Species (EPS) will be captured through the EPS Licensing process.

12. Indicative management measures are outlined which would be developed in consultation with the Marine Management Organisation (MMO) and other relevant bodies (see Section 1.7) at the pre-construction stage, based on the final design of North Falls. This document therefore provides a framework for discharging the Deemed Marine Licence (DML) conditions securing the Outline SIP and for further discussion and consultation by the Applicant with the MMO and other relevant stakeholders, including the relevant Statutory Nature Conservation Body (SNCB), to agree the exact details of any required project related management measures. Ultimately the MMO will be responsible for approving the final SIP pursuant to the DML(s).

1.1.3 Updates to this version of the Outline SIP

13. This version of the Outline SIP (Revision 1) has been updated to take into account comments and Relevant Representations during the Examination Process.

14. Updated text to clarify the Applicant's approach on the use of noise reduction measures and / or Noise Abatement System (NAS) has been added to Section 1.7.2.2.

1.1.4 Draft Development Consent Order / Deemed Marine Licences

15. The final SIP will be submitted for approval by the MMO which is secured in within the DML conditions of the draft DCO (Document Reference: 6.1).

1.1.5 Project Background

16. The North Falls array area will cover an area of approximately 95 kilometre squared (km^2). The closest point to the coast is 40 kilometres (km) from the array area. Water depths within the array area range from 5m to 59m (relative to the Lowest Astronomical Tide (LAT)), with a mean depth of 30m LAT.

17. The detailed design of North Falls (e.g. numbers of wind turbine generators (WTG) and foundation type) will not be determined until the post-consent stage. Therefore, realistic worst-case scenarios have been adopted within the assessment which ensures the in-principle mitigation and management measures within this Outline SIP are precautionary and robust.

18. The indicative construction programme assumes that the earliest the offshore construction works can start is 2027. Offshore construction works would require approximately two years (excluding pre-construction activities such as surveys). It should be noted that the construction programme is dependent on numerous factors, including consent timeframes and funding mechanisms.

1.1.6 Requirement for this Document

19. Due to the long lead in times for the development of offshore wind farms, it is not possible to provide final detailed method statements for piling prior to consent and, as a result, the detail of any required mitigation can also not be agreed at this stage. The agreement of guiding principles to mitigation through this Outline SIP as part of the consenting process allows for the final mitigation to be specified post-consent and pre-construction as part of the detailed design and allows refinements to be made based on the industry practice, available knowledge and technology at that time.

20. This Outline SIP reflects the commitment of the Applicant to undertake required measures to reduce the potential for any significant disturbance of harbour porpoise in the SNS SAC, whilst allowing scope for refinement of the measures through consultation once the final construction methods for North Falls have been confirmed. This approach will also remove the need to revise the DML condition should the most suitable measures to be adopted change between the time of consent and construction.

21. A final SIP will be produced at least six months prior to the commencement of pile driving, following revision and consultation, as per the outline schedule in Section 1.2.1.

22. The Applicant acknowledges that any required mitigation or management measures should be precise, effective and deliverable in order to ensure no AEOI of the SNS SAC for harbour porpoise from North Falls. The SIP process is designed to ensure that this is the case in the context of ongoing Project refinement. Section 1.2.1 provides an outline of the proposed schedule for refinement and sign-off for the final SIP.

23. Any requirements to implement noise abatement technology would be subject to additional marine licensing processes, if required.

1.2 Consultation

24. Comments received from Natural England (NE) for the PEIR submission (01/08/2023) suggested in order for NE to agree there will be no Adverse Effect on the Integrity (AEOI) of the SNS SAC, then appropriate mitigation must be implemented through the MMMP and SIP. Table 1.1 provides details for consultation comments received regarding the Outline SIP during the pre-application stage. Table 1.2 provides an outline of the expected consultation milestones throughout the development of the SIP, prior to construction.

Table 1.1 Outline SIP consultation comments

Consultee	Date / Document	Comment	Response / where addressed in the SIP
Natural England	21/03/2024 draft Outline SIP	We acknowledge that this is an outline SIP and that the final document will be based on any updated information on management measures, advice, or guidance for the SNS SAC and the final design of North Falls OWF. We are content that the final SIP will be produced at least six months prior to the commencement of pile driving, following revision and consultation.	Noted.
Natural England	21/03/2024 draft Outline SIP	We note that this SIP's focus is on the potential for any significant disturbance of harbour porpoise from underwater noise during piling whilst offshore UXO clearance required for North Falls will be consented and mitigation determined as part of a separate Marine Licence application.	Agreed
Natural England	21/03/2024 draft Outline SIP	Natural England is content that a wide range of potential mitigation measures are being considered.	Noted.
MMO	28/03/2024 draft Outline SIP	At this stage, the MMO cannot identify any additional information that should be included in the Outline SIP, and recognise that the draft SIP will be developed and refined once the final project design is confirmed. Paragraph 71 of the document mentions that the in-combination assessment has been based on a single piling event within North Falls, with single piling occurring in the other Offshore Wind Farms (OWFs), as it is deemed unlikely that all OWFs would or could be simultaneously conducting piling activities. However, the MMO notes that the PEIR assumed the possibility of simultaneous piling at North Falls. Therefore, the SIP should consider worst-case piling scenarios. The MMO defer to Natural England for comments on site integrity.	Within the RIAA, the in-combination approach is based on the potential for single piling to be occurring at each OWF. This approach allows for some of the OWFs not to be piling at the same time, while others could be simultaneously piling. However, for harbour porpoise, an assessment has also been provided to account for multiple piles at each project, under the spatial (20%) and seasonal (10%) SNS SAC thresholds.
MMO	28/03/2024 draft Outline SIP	With regard to paragraph 14. If not already available, the MMO is happy to provide the standard SIP condition wording that is recommended for	The SIP is conditioned in the draft DCO (Document Reference: 6.1)

Consultee	Date / Document	Comment	Response / where addressed in the SIP
		inclusion within the Deemed Marine Licences.	

1.2.1 Schedule for Agreement

25. It is not possible at this stage to determine exact dates for agreement and refinement of the final SIP. However, the key milestones have been outlined in Table 1.2 to indicate the likely development of the SIP from its current Outline status to the final version between consent award and the start of construction.

Table 1.2 Indicative Milestones for Refinement of the Outline SIP towards Agreement of the Final SIP Pre-Piling

Indicative Stage	When	Action for the Applicant	Relevant Authority / Consultee	Status
Draft Outline SIP	Prior to DCO submission	Draft Outline SIP to be sent out for consultation prior to DCO submission	MMO and NE	Completed
Outline SIP	DCO submission	Outline SIP to be submitted with DCO application	Secretary of State and all consultees	This document
Refining of pile design	Post-consent	Any updates or changes to the pile design and programme during the pre-construction period will be considered in terms of changes to the SIP. The Applicant will review the AA and Outline SIP and if necessary, undertake an assessment based on the refined piling design and programme, taking into account an updated in-combination scenario. Any mitigation and management measures that have long-lead in times will be considered at this stage to ensure they would be available for use should they be required. The results of this would inform the final pile design and programme.	Internal only	To be completed
Final pile design	Pre-construction	Final piling options and programme will be confirmed and used to refine any assessment required for North Falls alone and in-combination assessment. Any final mitigation and management measures required would be confirmed.	Internal only	To be completed
Draft SIP	Approximately 12 months prior to foundation installation	The SIP will be updated to capture the outputs of any necessary assessments and mitigation measures, in the context of the relevant in-combination scenario.	MMO and the relevant SNCB (NE)	To be completed
Final SIP	No sooner than approximately nine months and no later than six months prior to foundation installation	The SIP will be updated and finalised and submitted to discharge the relevant DML condition(s). Within the final SIP, an implementation plan and details of any monitoring requirements to assess the effectiveness of mitigation measures will be included. The final SIP will be submitted for approval approximately nine to six months prior to the	MMO and the relevant SNCB (NE)	To be completed

Indicative Stage	When	Action for the Applicant	Relevant Authority / Consultee	Status
		commencement of pile driving for written approval from the MMO prior to any piling works commencing.		
Reporting	Following foundation installation completion	Monitoring/management reports will be submitted to the MMO in accordance with the final SIP.	MMO	To be completed

1.3 Southern North Sea SAC for Harbour Porpoise

26. The SNS SAC has been recognised as an area with persistent high densities of harbour porpoise (JNCC, 2017; JNCC and Natural England, 2019) and is the largest designated site for harbour porpoise in the UK and European waters at the time of designation. The SNS SAC is located within the North Sea Management Unit (MU) for harbour porpoise (Inter-Agency Marine Mammal Working Group (IAMMWG), 2023).

27. The SNS SAC has a surface area of 36,951km^2 and covers both winter and summer habitats of importance to harbour porpoise, with approximately 27,028km^2 of the site being important in the summer period (183 days from April to September inclusive) and 12,696km^2 of the site being important in the winter period (182 days from October to March inclusive) (JNCC, 2017; JNCC et al., 2020).

28. The North Falls array area is within the SNS SAC winter area, and the North Falls array area is 74km from the SNS SAC summer area at its closest point.

29. The substrate in the array area is dominated by sandy gravel/ gravelly sand. Mobile sand waves of up to 13m peaks are present in parts of the array area.

30. The SNS SAC Site Selection Report (JNCC, 2017) identified that the SNS SAC site supports approximately 18,500 individuals (95% Confidence Interval (CI) = 11,864 - 28,889) for at least part of the year (JNCC 2017). However, JNCC and Natural England (2019) states that because this estimate is from a one-month survey in a single year (the Small Cetaceans in European Atlantic waters and the North Sea (SCANS) II survey in July 2005), it cannot be considered as an estimated population for the site. It is therefore not appropriate to use site population estimates in any assessment of effects of plans or projects on the site (i.e. Habitats Regulations Assessment (HRA)), as they need to take into consideration population estimates at the MU level, to account for daily and seasonal movements of the animals (JNCC and Natural England 2019).

1.3.1 Conservation Objectives

31. The Conservation Objectives for the SNS SAC are designed to ensure that the obligations of the Habitats Directive can be met. Article 6(2) of the Directive requires that there should be no deterioration or significant disturbance of the qualifying species or to the habitats upon which they rely.

32. The Conservation Objectives for the site are (JNCC and Natural England, 2019):

33. *To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for the harbour porpoise in UK waters.*

34. *In the context of natural change, this will be achieved by ensuring that:*

- *Harbour porpoise is a viable component of the site;*
- *There is no significant disturbance of the species; and*
- *The condition of supporting habitats and processes, and the availability of prey is maintained.*

35. These Conservation Objectives are "a set of specified objectives that must be met to ensure that the site contributes in the best possible way to achieving Favourable Conservation Status (FCS) of the designated site feature(s) at the national and biogeographic level" (JNCC and Natural England, 2019).

1.3.1.1 Conservation Objective 1: Harbour porpoise is a viable component of the site

36. This Conservation Objective is designed to minimise the risk of injury and killing or other factors that could restrict the survivability and reproductive potential of harbour porpoise using the SAC. Specifically, this objective is primarily concerned with operations that would result in unacceptable levels of impact on harbour porpoise using the SAC. Unacceptable levels are defined as those that would have an impact upon the FCS of the population of the species in their natural range.

37. Harbour porpoise are considered to be a viable component of the site if they are able to live successfully within it. This SAC has been selected primarily for its long term, relatively higher densities of harbour porpoise in contrast with other areas of the North Sea. The implication is that it provides relatively good habitat for foraging and may also be used for breeding and calving (JNCC and Natural England 2019). However, because the number of harbour porpoise using the site naturally varies there is no exact value for the number of animals expected within the site (JNCC and Natural England, 2019).

38. Harbour porpoise are listed as EPS under Annex IV of the Habitats Directive and are therefore protected from the deliberate killing (or injury), capture and disturbance throughout their range. Within the UK, The Habitats Directive is enacted through The Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017. Under these Regulations, it is an offence if harbour porpoise are deliberately disturbed in such a way as to:

- Impair their ability to survive, to breed or reproduce, or to rear or nurture their young; or
- To affect significantly the local distribution or abundance of that species.

39. JNCC *et al*. (2010) interprets the term deliberate as "*actions by a person who knows, in the light of the relevant legislation that applies to the species involved, and the general information delivered to the public, that his action will most likely lead to an offence against a species, but intends this offence or, if not, consciously accepts the foreseeable results of his action*".

1.3.1.2 Conservation Objective 2: There is no significant disturbance of the species

40. Disturbance of harbour porpoise typically, but not exclusively, originates from operations that cause underwater noise, including activities such as seismic surveys, pile driving and sonar. Responses to noise can be physiological and/or behavioural. However, disturbance is primarily a behavioural response to noise and may lead to harbour porpoise being displaced from the affected area. Therefore, operations within or affecting the SAC should be managed to ensure that any individuals potential usage of the site is maintained.

41. JNCC et al. (2020) have produced guidelines to minimise the risk of physical injury to cetaceans from various sources of loud, underwater noise.

42. Disturbance is considered to be significant if it leads to the exclusion of harbour porpoise from a significant portion of the site for a significant period of time. The current SNCB guidance for the assessment of significant noise disturbance on harbour porpoise in the SNS SAC (JNCC et al., 2020) is that:

"*Noise disturbance within an SAC from a plan/project individually or in combination, is significant if it excludes harbour porpoises from more than:*

- *20% of the relevant area[1] of the site in any given day[2], or*
- *an average of 10% of the relevant area of the site over a season[3],[4]*".

1.3.1.3 Conservation Objective 3: The condition of supporting habitats and processes, and the availability of prey is maintained.

43. Within this Conservation Objective, supporting habitats relates to the characteristics of the seabed and water column, and supporting processes encompass the movements and physical properties of the habitat. The maintenance of supporting habitats and processes contributes to ensuring that prey is maintained and available to harbour porpoise using the SAC. Harbour porpoise are strongly reliant on the availability of prey species due to their high energy demands and are highly dependent on being able to access prey species year-round. The densities of harbour porpoise within a site are therefore highly dependent on the availability of key prey species.

44. This Conservation Objective is designed to ensure that harbour porpoise are able to access food resources year round, and that activities occurring in the SNS SAC will not affect this.

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[1] The relevant area is defined as that part of the SAC that was designated on the basis of higher persistent densities for that season (summer defined as April to September inclusive, winter as October to March inclusive).

[2] "*To be considered within the HRA and, if needed, licence conditions should ensure that daily thresholds are not exceeded. Day to day monitoring of compliance is not practicable and therefore retrospective compliance monitoring is required to test whether the licence conditions are being adhered to*".

[3] "*Summer defined as April to September inclusive, winter as October to March inclusive*".

[4] "*For example, a daily footprint of 19% for 95 days would result in an average of 19x95/183 days (summer) = 9.86%*".

1.3.2 Management Measures

45. Specific management measures are yet to be developed for the SNS SAC, however JNCC and Natural England (2019) advise that 'the site should be managed in a way that ensures that its contribution to the maintenance of the harbour porpoise population at FCS is optimised, and that this may require management of human activities occurring in or around the site if they are likely to have an adverse effect on the site's Conservation Objectives either directly or indirectly identified through the assessment process'.

46. JNCC and Natural England (2019) also state that 'management measures are the responsibility of the relevant regulatory bodies, which consider the SNCBs' advice and hold appropriate discussions with the sector concerned, but the scale and type of mitigation is decided by the Regulators'.

1.3.3 Advice on Activities

47. JNCC and Natural England (2019) have provided advice on activities that specifically occur within or near to the SNS SAC site that could be expected to effect on site integrity. The key impacts and activities that JNCC and Natural England (2019) consider as having the greatest effect on the population of UK harbour porpoise and therefore the SNS SAC are:

- Commercial fisheries with by-catch of harbour porpoise;
- Increased contaminants from discharge / run-off from land fill, terrestrial and offshore industries;
- Increased anthropogenic underwater noise from shipping, drilling, dredging and disposal, aggregate extraction, pile driving, acoustic surveys, underwater explosion, military activity, acoustic deterrent devices and recreational boating;
- Death or injury by collision with, shipping, recreational boating and tidal energy installations; and
- Reduction in prey resources by commercial fisheries.

48. The aim is that the advice should help identify the extent to which existing activities are, or can be made, consistent with the Conservation Objectives, and thereby focus the attention of Relevant and Competent Authorities and surveillance programmes to areas that may need management measures (JNCC and Natural England, 2019).

1.4 Project Description

49. A full description of the North Falls design envelope is presented in the Environmental Statement (ES).

50. Once built, North Falls would comprise the following offshore components:

- Up to 57 offshore WTGs and their associated foundations;
- Scour protection around foundations and subsea cables as required;

- Up to two offshore substation platform/s (OSP/s) and/or offshore converter platform (OCP) supporting required electrical equipment; and
- Subsea cables comprising:
  - Array cables between the WTGs and OSP(s)/OCP; and
  - Export cables between the OSP(s) and landfall.

51. The detailed design of North Falls (e.g. final numbers of WTGs, layout configuration, foundation type and requirement for scour protection) will be determined post-consent. Therefore, the key parameters presented in Table 1.3 are indicative based on current information and assumptions. These parameters have been used to determine the worst case scenario discussed further in the Report to Inform Appropriate Assessment.

52. This section will be revised as the final project design is confirmed at the pre-construction stage.

Table 1.3 Key Relevant Parameters

Parameter	Details
Approximate offshore construction duration	2 years
Array area	95km^2
Offshore cable corridor length	57km
Array area water depth range	5 to 58m
Approximate distance from array area to coast (closest point)	40km
Maximum number of WTGs	57
Maximum number of OSP(s)/OCP	2
WTG foundation type options	• Monopile • Mono-suction bucket • Jacket with 3 or 4 legs (attached to the seabed by pin piles, suction buckets legs)
OSP(s)/OCP foundation type options	• Monopile (drilled and/or driven) • Jacket (with either pin piles or suction bucket legs)
Maximum number of piles per foundation for WTGs	Monopile – 1 Pin-pile (jacket) - 8
Maximum number of piles for WTGs	Monopile – 57 Pin piles - 456
Maximum number of piles for OSP(s)/OCP	Monopile – 2 Pin pile - 12
Hammer energies (kilojoules) (kJ)	Monopile – 6,000kJ Pin pile – 4,400kJ
Maximum pile diameter (m)	Monopile – 17m Pin pile – 6m

1.5 Assessment for North Falls Alone

1.5.1 Approach to Assessment

53. The approach to the assessment for the potential disturbance of harbour porpoise in the SNS SAC winter area from underwater noise follows the current advice from the SNCBs (currently JNCC et al., 2020), that:

- Displacement of harbour porpoise should not exceed 20% of the relevant area of the site in any given day or on average exceed 10% of the relevant area of the site over a season.
- The effect of the Project should be considered in the context of the seasonal components of the SAC area, rather than the SAC area as a whole.
- For monopiles, a distance of 26km (Effective Deterrent Radius; EDR) from an individual percussive piling location should be used to assess the area of SAC habitat that harbour porpoise may be disturbed from during piling operations for monopiles, with a potential disturbance area of 2,123.7km^2.
- For pin-piles, or monopiles with noise abatement, a distance of 15km (EDR) from an individual percussive piling location should be used to assess the area of SAC habitat that harbour porpoise may be disturbed from during piling operations, with a potential disturbance area of 707.9km^2.

54. The JNCC *et al*. (2020) recommended EDRs are not equivalent to 100% deterrence/disturbance in the associated area (i.e. some animals show greater reaction than others) but nor do they represent the limit range at which effects have been detected.

55. The summer area is approximately 27,028km^2 and the summer period is from 1st April to 30th September (183 days). The winter area is approximately 12,696km^2 and the winter period is from 1st October to 31st March (182 days) (JNCC *et al*., 2020). The winter area is the only one of relevance for North Falls.

56. The seasonal averages are calculated by multiplying the average potential area of effect on any one day by the proportion of days within the season piling could occur (i.e. taking into account the average area of overlap with the summer area of the SNS SAC and number of piling days in that season). For example, a daily footprint of 19% for 95 days would result in an average of 19x95/183 days (summer) = 9.86% (JNCC *et al*., 2020).

57. The assessment to inform the final SIP for North Falls Alone will take into account;

- Whether the piling will be by monopile or jacket pin pile;
- Whether Noise Abatement Systems (NAS) will be used;
- The number of piling locations in any one day[5];

[5] One day refers to one calendar day (i.e. midnight to midnight) to ensure noisy activities can be effectively assessed and managed across projects (if required)

- The distance between multiple piling locations in any one day; and
- The number of days of piling activities in the winter season.

58. It should be noted that when referring to the number of piling locations on any one day, the number of pile strikes, or the length of piling at each location, does not matter under these thresholds, as the thresholds refer to just the location of piling. This means that a pile installation that goes over midnight into a new day, would count as piling on two days.

59. The number of pile locations in a day, and the number of piling days required, will be considered together to inform a number of scenarios relating to number of piles per day and number of piling days. This is to ensure that the assessment under the seasonal threshold is not artificially inflated when considering the worst-case of both the maximum number of piles per day, and for all piling days. Contingency will be included within these scenarios to account for the potential for one pile location to be piled across multiple days, and the worst-case of all potential options will be taken forward for assessment.

1.5.2 Assessment of Likely Significant Effects

60. There is the potential for effects from underwater noise during piling at North Falls to disturb harbour porpoise in the SNS SAC winter area.

61. Table 1.4 below summarises the assessments provided within the RIAA Part 3 Marine Mammals (Annex II species) (Document Reference: 7.1.3), for the potential for piling at North Falls. Based on the results of these assessments, North Falls have made a commitment to only pile one monopile a day (without noise reduction) within the winter season (October to March inclusive) (Section 1.7.1). Therefore, there would be no potential for adverse effect on the integrity of the SNS SAC due to North Falls piling alone.

Table 1.4 Summary of assessments for piling at North Falls within the SNS SAC winter area (scenarios in grey will not be undertaken, to ensure there is no potential for adverse effect on site integrity)

Piling scenario at North Falls	Maximum overlap with SNS SAC winter area on any one day	Average overlap with SNS SAC winter area over the season	Additional mitigation	Potential adverse effect on site integrity
One monopile per day	16.19%	4.91%	Not required for Project alone.	No
One jacket pin pile location per day	5.57%	2.45% - 5.57% (depending on number of piling days)		
Two monopile locations in one day, with maximum potential separation	*21.18%*	-	Only one monopile location will be piled on each day within the winter season (October to March inclusive), unless noise reduction measures are utilised.	No
Two jacket locations in one day, with maximum potential separation	9.74%	1.71% - 7.79% (depending on number of piling days)	Not required for Project alone	No
One monopile location and one jacket location in one day, with maximum potential separation[6].	17.20%	4.75%		No
Three monopile locations in one day, with maximum potential separation	*22.73%*	-	Only one monopile location will be piled on each day within the winter season (October to March inclusive), unless noise reduction measures are utilised.	No
Three jacket locations in one day, with maximum potential separation	11.70%	1.32% - 7.83% (depending on number of piling days)	Not required for Project alone	No

[6] This covers the potential for monopile installation for WTGs on the same day as OSP(s)/OCP installation.

1.6 Assessment for North Falls In-Combination

1.6.1 Approach to Assessing In-Combination Effects

62. The approach to the in-combination assessment for the potential disturbance of harbour porpoise in the SNS SAC winter area from underwater noise follows the current advice from the SNCBs (currently JNCC et al., 2020), that, in addition to the approach provided in Section 1.5.1 for North Falls alone:

- For UXO clearance, a distance of 26km (EDR) should be used to assess the area of SAC habitat that harbour porpoise may be disturbed from during a clearance event, with a potential disturbance area of 2,123.7km^2.
- For seismic surveys, a distance of 12km (EDR) from the source location should be used to assess the area of SAC habitat that harbour porpoise may be disturbed from, with a potential disturbance area of 452.4km^2. For seismic surveys, it should be considered as a moving noise source, rather than a stationary one, and therefore the distance a survey could be undertaken on, over a day, should be considered as the source of disturbance, and a buffer of 12km applied to that distance.
- For geophysical surveys (such as those associated with construction works), a distance of 5km (EDR) from the source location should be used to assess the area of SAC habitat that harbour porpoise may be disturbed from, with a potential disturbance area of 78.5km^2. As for seismic surveys, geophysical surveys should be considered as a moving source, and the distance that could be surveyed in one day taken into account.

63. The seasonal average of all projects and activities have been included within the assessment, not just the activities that may take place on the same day as piling at North Falls.

1.6.2 Assessment of In-Combination Effects

64. There is the potential for in-combination effects from underwater noise with other projects and activities during piling at North Falls to disturb harbour porpoise in the SNS SAC winter area.

65. Further details are provided in the RIAA (Part 3 Marine Mammals (Annex II species) (Document Reference: 7.1.3), an updated in-combination assessment to include project information as of January 2025 was provided in 9.14 Further Information Regarding Marine Mammals [REP1-057].

66. The in-combination assessments are based on the maximum potential overlap with SNS SAC winter areas based on 26km EDR at closest point for North Falls.

67. For the indicative in-combination scenario, other noise generating activities, where there is a high likelihood that the activity could occur at the same time as piling at North Falls, have been determined. This is to ensure that the SIP provides a realistic in-combination assessment for the activities that could be occurring at the same time.

68. The approach to the in-combination assessments is based on a precautionary approach to determine the worst-case scenario for piling and / or other activities that could result in underwater noise and the potential disturbance of harbour

porpoise in the SNS SAC. As previously outlined, the in-combination assessment will be reviewed and updated as the SIP is developed, and more information is available on the schedules for other projects and activities.

69. Activities and other noise sources considered for in-combination effects of underwater noise which could disturb harbour porpoise currently include:

- piling at OWFs;
- other construction activities at OWFs (vessels, cable installation works, dredging, seabed preparation and rock placement);
- geophysical surveys for other OWFs;
- aggregate extraction and dredging;
- installation of subsea cable and pipelines;
- oil and gas seismic surveys; and
- UXO clearance at other OWFs.

70. The potential piling period for North Falls has been based on the widest likely range of offshore construction and piling dates, dependent on the construction scenario, as a very precautionary approach. It should be noted that while the projects included within the assessment have the potential to overlap with North Falls, there is a lot of uncertainty on when OWFs could be piling. This assessment is therefore considered worst-case.

71. Under the SNCB guidance for assessing the potential for effect from disturbance as a result of piling, it is important to consider projects that have the potential for disturbance effects to overlap with the SNS SAC. Therefore, OWF projects that are either within the SNS SAC winter area, or within 26km of the SNS SAC winter area with the potential to be piling at the same time included in the assessment are:

- Five Estuaries is within the winter area.
- Sheringham Shoal Extension Project (SEP) is approximately 26km from the winter area.
- Dudgeon Extension Project (DEP) is within 26km from the winter area.

72. The in-combination assessment has been based on a single piling event within North Falls, with single piling occurring in the other OWFs, as it is considered unlikely that all OWFs would or could be undertaking simultaneous piling all at the same time.

73. The approach to the in-combination assessment, based on single piling, would allow for some of the OWFs not to be piling at the same time while others could be simultaneously piling. This is considered to be the most realistic worst-case scenario, as it is highly unlikely that all OWFs would or could be simultaneously piling at exactly the same time or even on the same day as piling at North Falls.

74. The assessments for all OWFs are based on the worst-case for piling of monopiles with no noise abatement or reduction (26km EDR). It should be noted that the potential areas of disturbance assume that there is no overlap in the

areas of disturbance between different projects and are therefore highly conservative.

75. Other noisy activities to be considered for the in-combination assessment are;

- Up to one geophysical survey at any one time
- Up to one oil and gas seismic survey
- Up to one UXO clearance event

76. Note that the above three listed activities have much shorter lead-in times than offshore wind piling, and therefore it is not possible to determine whether and how many (if any) have the potential to be undertaken at the same time as piling at North Falls. These activities will be included within the SIP, where applicable, to ensure a worst-case scenario is mitigated. A review of the applied for and consented activities at time of SIP finalisation will be conducted, and only those activities that have either been applied for or consented at the time of submission will be considered.

77. Table 1.5 below summarises the assessments provided within Section 3.4.3.4.1 of the RIAA Part 3 Marine Mammals (Annex II species) (Document Reference: 7.1.3) for the potential for piling at North Falls in-combination with other OWF projects. The results of the in-combination assessment show that all assessed scenarios breach either the spatial (20%) or both the spatial and seasonal (10%) thresholds. Therefore, without additional mitigation and management, there is the potential for an adverse effect on site integrity.

Table 1.5 Summary of assessments for piling at North Falls in-combination with other OWFs within the SNS SAC winter area

In-combination assessment scenario	Maximum overlap with SNS SAC winter area for all in-combination projects on any one day	Average overlap with SNS SAC winter area for all in-combination projects over the season	Potential adverse effect on site integrity
Single monopile location at other OWFs with a single monopile location at North Falls	30.24%	11.83%	Yes
Single monopile location at other OWFs with a single jacket location at North Falls	22.54%	12.49%	Yes
Two monopile locations per day at other OWFs with one monopile location at North Falls	34.6%	9.63%	Yes
Two monopile locations per day at other OWFs with two jacket locations at North Falls	29.2%	12.51%	Yes
Two monopile locations per day at other OWFs with one monopile and one jacket location at North Falls	32.0%	9.47%	Yes

78. Table 1.4 below summarises the assessments provided within Section 3.4.3.4.1 of the RIAA Part 3 Marine Mammals (Annex II species) (Document Reference: 7.1.3) for the potential for all in-combination activities and projects undertaken within the same season as piling at North Falls. The results of the in-combination assessment for all projects and activities show that there is the potential to breach both the spatial (20%) and seasonal (10%) thresholds. Therefore, without additional mitigation and management, there is the potential for an adverse effect on site integrity.

Table 1.6 Summary of assessments for piling at North Falls in-combination with all activities and projects within the SNS SAC winter area (activities shown in grey are included as indicative activities only, due to a lack of information on potential activities)

In-combination assessment scenario	Maximum overlap with SNS SAC winter area for all in-combination projects on any one day	Average overlap with SNS SAC winter area for all in-combination projects over the season	Potential adverse effect on site integrity
All in-combination activities and projects; • Piling at OWFs including North Falls • Other construction activities and vessels at other OWFs • *Geophysical surveys (up to two)* • Aggregate and dredging projects • *Oil and gas seismic surveys (up to two)* • Subsea cables and pipelines • *High order UXO clearance*	72.96%	21.96%	**Yes**

79. Due to the potential for adverse effect on site integrity (as noted above), the development of the SIP for North Falls, and SIPs for other OWF projects, will be required to deliver the appropriate mitigation and management measures across projects and managed by the MMO, to ensure that there would be no AEOI as a result of disturbance to harbour porpoise as a designated feature of the SNS SAC in relation to the conservation objectives.

1.7 Outline Mitigation and Management Measures

80. This section of the Outline SIP discusses the measures currently available, or likely to be available in the future, which could be applicable to reduce the in-combination effects of underwater noise disturbing harbour porpoise in the SNS SAC during pile driving at North Falls.

81. For the selected measure, information will be provided in the final SIP to detail how the measure will result in the avoidance of significant disturbance to harbour porpoise, and hence allow the conclusion of no AEOI on the SNS SAC.

82. It should be noted that the following factors need to be considered and taken into account in the final SIP:

- Formal guidance on the development of a SIP and how they will be managed is currently unavailable;
- The final design parameters for North Falls have not yet been determined, and the RIAA Part 3 Marine Mammals (Annex II species) (Document Reference: 7.1.3) was based on the predicted worst-case scenario; and
- The final design and programme of other plans and projects has not yet been determined, and therefore the actual in-combination scenario is currently unknown.

83. The adopted project measures to be secured in the final SIP would be agreed and secured in the period between consent and the commencement of piling once project design parameters are finalised and subject to approval of the MMO in consultation with the relevant SNCB (Natural England).

84. Potential mitigation measures that could be delivered by North Falls broadly fall into two categories:

- Spatial: Minimising the total area of 'significant disturbance' at any one time. This could be a reduction in the area of the SNS SAC which is subject to noise levels that may cause significant disturbance to harbour porpoise; and / or
- Temporal: Minimising the duration of additional underwater noise generated through piling events or other noisy events over any given time frame that may cause 'significant disturbance' to harbour porpoise in the North Sea MU or the SNS SAC.

1.7.1 Project Alone Mitigation

1.7.1.1 Measure 1: Spatial Restriction

85. As noted in Section 1.5.2, the conclusions of the assessment for the Project alone show that multiple monopile piling locations in one day, within the winter season, would breach the spatial (20%) threshold. Therefore, North Falls have committed to only pile at one monopile location in any one day, during the winter season, unless NAS is utilised.

1.7.2 In-combination Effects Mitigation Options

1.7.2.1 Measure 2: Seasonal Restriction

86. An option which could be considered to mitigate in-combination effects, if required is a seasonal restriction. Due to the location of North Falls, it may be possible to ensure there is no potential for significant disturbance (or AEoI) under the noise thresholds by ensuring no piling is undertaken in the winter season (October to March inclusive). This would need to be managed alongside any other seasonal restriction in place for piling activities (e.g. for fish species).

1.7.2.2 Measure 3: Noise Reduction Measures / Noise Abatement Systems

87. Another option which could be considered to mitigate in-combination effects, if required is the use of noise reduction measures and / or NAS.

88. Primary noise reduction methods can be achieved through impact piling modification such as adjusting the piling energy, or use of alternative installation techniques (e.g. vibro piling, blue piling, High frequency low-impact (HiLo) piling and drilling).

89. NAS, also known as secondary noise mitigation, are currently being developed and improved that enable a reduction of pile driving noise (decibels) at source. These methods currently include various types of bubble curtain, hydro-sound dampers, screens or tubes.

90. A reduction in the noise at source would reduce the total area of potential disturbance to harbour porpoise. However, it should also be noted that many of these measures may increase the total duration of disturbance from underwater noise during foundation installation and this should be a consideration in an assessment of their efficacy.

91. It should be noted that suitability of any NAS will be dependent on a number of factors including pile diameter and length, ground conditions, and water depth. These factors will be considered in any assessment of the efficacy of the measure. The information to inform this selection will be contingent on the selection of the chosen foundation type and supplier which will only be available once contracts are being finalised post consent.

92. If it is deemed necessary to apply noise reduction measures and/or a NAS for piled foundations, in order to comply with Government policy on underwater sound or it is identified (during discussions with the MMO on the final plan following the final scheme design freeze post consent) as necessary mitigation to manage any predicted significant effects due to underwater sound from piling, then North Falls will be in a position (from a programme execution perspective) to implement such measures.

1.7.2.3 Measure 4: Different Foundation Types and Installation Methods

93. The use of different foundation types and installation methods within the consented project envelope, such as jacket pin piles or suction bucket foundations, could also be considered as an option to mitigate in-combination effects. This will include consideration of relevant technologies or methodologies, based on technical feasibility and commercial availability. This would be informed by pre-construction site investigation and technology developments. If practicable, the use of foundation types and/or installation methodologies other than impact pile driving (such as vibro-piling) would result in lower noise levels during the construction of the wind farms.

94. Industry wide developments are on-going in relation to various methods (such as double walled piles, and blue piling), which also have the potential to greatly reduce the area of potential disturbance from pile driving. These could be considered, subject to their feasibility for North Falls.

1.7.2.4 Other Potential Measures

95. Given the time lag between consent and the start of offshore construction, it is possible that new measures will become available. As such, the final SIP will not be restricted only to potential measures outlined above. Rather, the SIP allows the consideration and assessment of other relevant technologies or methodologies that may have emerged by the time of offshore construction.

This will ensure that any new technologies or methods that may be developed can be used during construction of North Falls.

1.7.2.5 Assessment of Efficacy of Measures and Implementation

96. Prior to the potential implementation of project mitigation measures, an assessment of the ability of each measure (alone or in conjunction with other measures) will be required to ensure the approach is able to contribute to a reduction in significant disturbance to harbour porpoise within the SNS SAC. The assessment is expected to include a degree of likely confidence in each measure.

97. The Applicant will work with the MMO and other consultees to ensure that any approach to such assessment, is done in timely manner, and using a robust approach.

98. Following assessment of project mitigation measures, the Applicant will work with the MMO to develop a timescale for the delivery of any measures, an implementation plan, as well as agreeing any reporting or monitoring requirements. The implementation plan will include the approach to enforcement of the measures, and how any failures will be rectified.

1.8 Finalisation of the SIP

99. This Outline SIP is based on the most appropriate potential mitigation measures, taking into account the current requirements, guidance, knowledge and proven available technology. This Outline SIP provides a summary of measures that could be undertaken to ensure there is no AEoI of the SNS SAC, and to provide certainty in relation to the conclusions of the RIAA, but is not intended to provide an exhaustive list of potential measures, as other options may become available at the time of finalisation.

100. When preparing the final SIP, the Applicant will review this Outline SIP and the conclusions of the AA as well as the final design of North Falls, and the potential in-combination effects of underwater noise during pile driving and if necessary, provide an up to date in-combination assessment using the most recent information on other projects' planned programmes in order to inform the final SIP. This will include consideration of all data provided through both the SNS Activity Tracker and the Developers Activity Tracker shared between the key offshore wind farms within (or within 26km of) the SNS SAC. The Applicant will seek to liaise directly with other offshore wind farm projects to ensure the most recent information is used to inform these assessments.

101. The final SIP will ensure that both the spatial (20%) threshold and seasonal (10%) threshold is not exceeded. Where the final SIP, to be submitted before piling activities take place, indicates that there is the potential for exceedance of either threshold, this would have to be managed or mitigated to ensure no breach of those thresholds in order for the final SIP to be approved.

102. Natural England will be a key consultee in the process of finalising the SIP pre-piling, including the approach to determining the most appropriate in-combination scenario.

103. A number of different options for the mitigation of underwater noise, in relation to the SNS SAC and SIP, have been included within this Outline SIP, including

options that will be considered for managing and mitigating any potential breaches of both the spatial (20%) and seasonal (10%) thresholds, such as:

- Seasonal (winter) restriction;
- Noise abatement systems;
- Alternative foundation methods and installation techniques; and
- Any other options that may become available between now and finalisation of the SIP (such as new installation techniques or noise abatement technologies).

104. It is not possible at this stage to determine which additional options would be needed, or which would be the most appropriate to implement, as it depends on the final pile design, the piling programme, the other noisy activities that may be happening at the same time, and whether mitigation options become available at the time of finalisation that are not available now.

105. Therefore, the Applicant considers that whilst it is currently possible to state the options that would be considered, it would not be appropriate to finalise and commit to mitigation options at this time, as it would not allow for future methods and knowledge to be incorporated.

106. When the Applicant is considering the detailed design for piling, potential mitigation measures will be a key consideration during that process. It is not in the Applicant's interest to choose a piling design that has only limited mitigation options that could be implemented through the SIP. Having only limited options available could adversely effect on the wider project programme. For the reasons set out above, the Applicant considers that retaining the flexibility that the SIP allows (compared to fixed mitigation now) is beneficial from both an ecological perspective and from a project delivery perspective.

1.9 References

JNCC, Natural England and Countryside Council for Wales (2010) 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.
JNCC (2017) SAC Selection Assessment: Southern North Sea. January 2017. Joint Nature Conservation Committee, UK. Available from: http://jncc.defra.gov.uk/page-7243.
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.
JNCC, DAERA and Natural England (2020). Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs (England, Wates and Northern Ireland). Dated June 2020.
IAMMWG. (2023). Review of Management Unit boundaries for cetaceans in UK waters (2023). JNCC Report 734. JNCC, Peterborough, ISSN 0963-8091. https://hub.jncc.gov.uk/assets/b48b8332-349f-4358-b080-b4506384f4f7.

NORTH FALLS

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