FIVE ESTUARIES
OFFSHORE WIND FARM

FIVE ESTUARIES OFFSHORE WIND FARM

ENVIRONMENTAL STATEMENT

VOLUME 9, REPORT 15: OUTLINE SOUTHERN NORTH SEA SPECIAL AREA OF CONSERVATION SITE INTEGRITY PLAN

Application Reference	EN010115
Application Document Number	9.15
Revision	A
APFP regulation	5(2)(q)
Date	March 2024

Project	Five Estuaries Offshore Wind Farm
Sub-Project or Package	DCO Application
Document Title	Volume 9, Report 15: Outline SNS SAC SIP
Application Document Number	9.15
Revision	A
APFP Regulation	5(2)(q)
Document Reference	005023932-01

Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
A	Mar-24	ES	GoBe	GoBe	VE OWFL

CONTENTS

FIGURES

DEFINITION OF ACRONYMS

Term	Definition
AA	Appropriate Assessment
AEoI	Adverse Effect on Integrity
DAERA	Department of Agriculture, Environment and Rural Affairs
DCO	Development Consent Order
DEPONS	Disturbance Effects of Noise on the Harbour Porpoise Population in the North Sea
dML	Deemed Marine Licence
EIA	Environmental Impact Assessment
ES	Environmental Statement
JNCC	Joint Nature Conservation Committee
km	Kilometre
MMMP	Marine Mammal Mitigation Protocol
MMO	Marine Management Organisation
NAS	Noise Abatement System
NSIP	Nationally Significant Infrastructure Project
OSP	Offshore Substation Platform
OWF	Offshore Wind Farm
PCoD	Population Consequences of Disturbance
SAC	Special Area of Conservation
SIP	Site Integrity Plan
SNS	Southern North Sea
SNCB	Statutory Nature Conservation Body
SoS	Secretary of State
UK	United Kingdom
UXO	Unexploded Ordnance
VE	Five Estuaries
WTG	Wind Turbine Generator

GLOSSARY

Term	Definition
Array Area	The areas where the WTGs will be located. These should be referred to as the northern and southern arrays to differentiate them.
Development Consent Order	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP) from the Secretary of State (SoS) for the Department for Energy Security and Net Zero (DESNZ).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact in question with the sensitivity of the receptor in question, in accordance with defined significance criteria.
ES	Environmental Statement (the documents that collate the processes and results of the EIA).
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial, resulting from the activities associated with the construction, operation and maintenance, or decommissioning of the project.
Maximum Design Scenario (MDS)	The maximum design parameters of the combined project assets that result in the greatest potential for change in relation to each impact assessed.
Mitigation	Mitigation measures, or commitments, are commitments made by the project to reduce and/or eliminate the potential for significant effects to arise as a result of the project.
Significant Effects	It is a requirement of the EIA Regulations to determine the likely significant effects of the development on the environment which should relate to the level of an effect and the type of effect. Where possible significant effects should be mitigated.
The Applicant	Refer to as Five Estuaries Offshore Wind Farm Limited (The Applicant) and refer to them as 'the Applicant' thereafter.
VE	The Project. Refer to as Five Estuaries Offshore Wind Farm (VE) and refer to VE thereafter.

1 INTRODUCTION

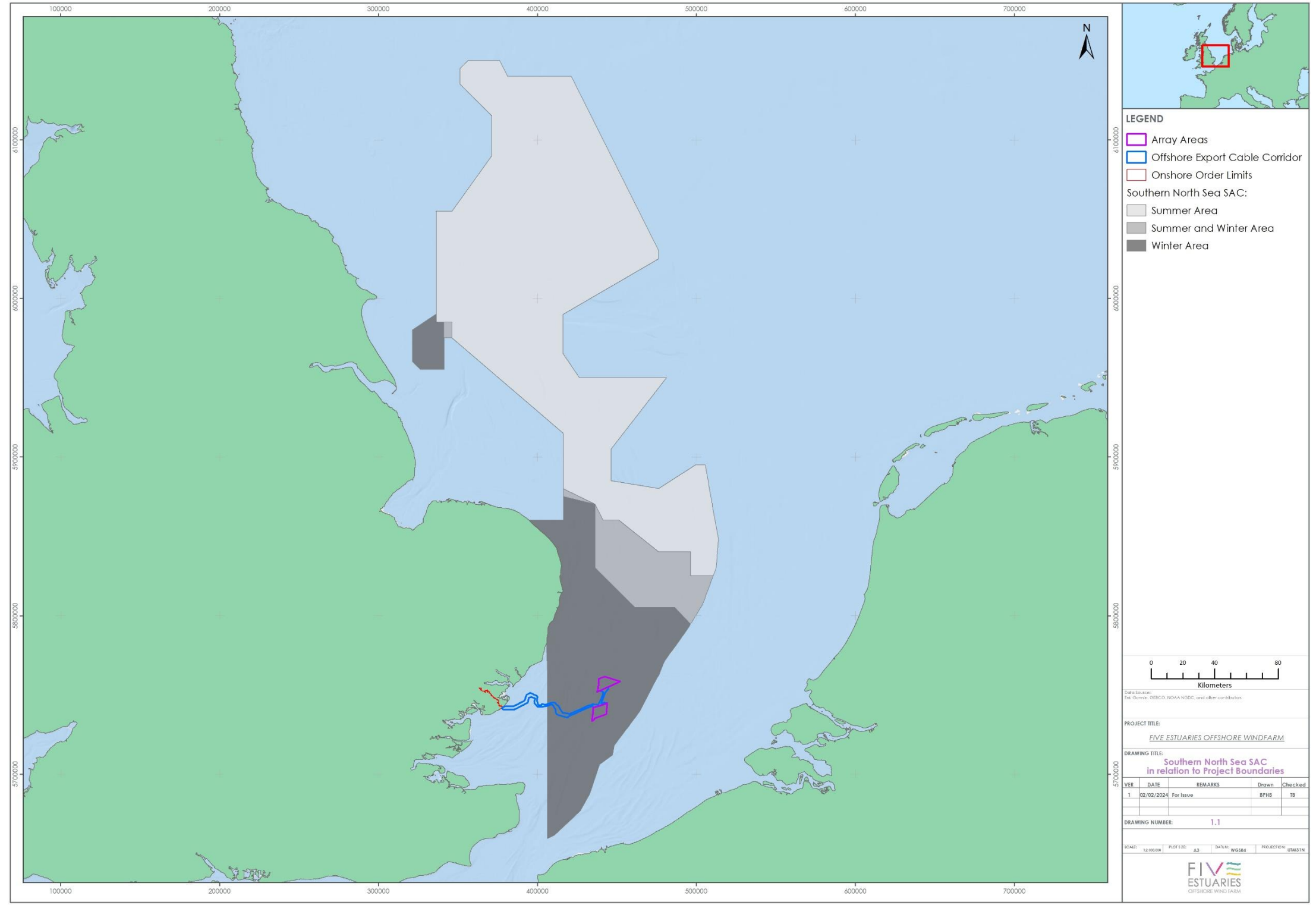
1.1 OVERVIEW

1.1.1 Five Estuaries Offshore Wind Farm Ltd. (referred to as 'the Applicant') is proposing an extension to the operational Galloper Offshore Wind Farm, known as Five Estuaries Offshore Wind Farm (hereafter 'VE'). VE will be located 37 km off the coast of Suffolk, at its closest point, in the Southern North Sea. VE will consist of both onshore and offshore infrastructure, including two proposed array areas, two offshore substation platforms and subsea cables to transfer electricity onshore (see Volume 6, Part 2, Chapter 1: Offshore Project Description (PD) for full details).

1.1.2 Volume 5, Report 4: Report to Inform Appropriate Assessment (RIAA) identified the need to address uncertainty regarding potential in-combination impacts from various projects. These projects may or may not have a construction timetable which overlaps with VE. Specifically, the uncertainty relates to harbour porpoise (*Phococena phococena*) and its habitat within the Southern North Sea Special Area of Conservation (SNS SAC). There's a concern about the risk of VE, in combination with other plans and projects, exceeding the underwater noise disturbance limits defined by the Statutory Nature Conservation Bodies (SNCB) (as per the Joint Nature Conservation Committee (JNCC) 2019 guidelines). The main source of uncertainty is the construction schedules of these other plans and projects, which could lead to a combined effect.

1.1.3 Therefore, in the case that driven or partly driven pile foundations are used, a Site Integrity Plan (SIP) has been committed to as a condition in the draft Development Consent Order (DCO) deemed Marine Licenses (dMLs). This Outline SIP aligns with the "Guidance for Assessing the Significance of Noise Disturbance Against Conservation Objectives of Harbour Porpoise SACs" (issued by JNCC, Natural England and the Department of Agriculture, Environment and Rural Affairs (DAERA) in 2020).

1.1.4 The SNS SAC's location in relation to VE is illustrated in Figure 1.1.


100000
200000
300000
400000
500000
600000
700000
6100000
6000000
5900000
5800000
5700000
N
LEGEND
Array Areas
Offshore Export Cable Corridor
Onshore Order Limits
Southern North Sea SAC:
Summer Area
Summer and Winter Area
Winter Area
0
20
40
80
Kilometers
Data Sources:
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM
DRAWING TITLE:
Southern North Sea SAC
in relation to Project Boundaries
VER
DATE
REMARKS
Drawn
Checked
1
02/02/2024
For Issue
BPHB
TB
DRAWING NUMBER:
1.1
SCALE:
1:2,000,000
PLOT SIZE:
A3
DATUM:
WGS84
PROJECTION:
UTM31N
FIVE ESTUARIES
OFFSHORE WIND FARM

1.2 PURPOSE OF THE OUTLINE SNS SAC SIP

1.2.1 The purpose of this Outline SNS SAC SIP is to clarify how VE intends to ensure the conclusions of the Appropriate Assessment (AA) will remain sound, particularly the conclusion that there will be no Adverse Effect on Integrity (AEoI) as identified in Volume 5, Report 4: RIAA. This need for clarity specifically concerns the absence of AEoI resulting from underwater noise disturbance affecting harbour porpoise within the SNS SAC, when considering various other plans and projects also affecting this area. The challenge arises from the fact that many projects have published construction schedules that are often longer than required, causing uncertainty about which plans and projects to include in the in-combination assessment and which might be relevant during the construction of VE.

1.2.2 This Outline SNS SAC SIP sets out the proposed approach to addressing this uncertainty. It identifies a range of potential mitigation measures that could be put into action by VE (if required) when creating the Final SNS SAC SIP before commencing licensed activities. This ensures that AEoI will be prevented concerning significant disturbance to harbour porpoise, aligning with the conservation goals of the SNS SAC. Ultimately, the SNS SAC SIP safeguards the conclusion that the SNS SAC won't be adversely affected.

1.2.3 There are several mitigation measures available, detailed in Section 3 below, along with an evaluation of their effectiveness. The selection of these mitigation measures (if indeed any are required) to maintain the conclusion of no AEoI will be determined when drafting the Final SNS SAC SIP before VE's construction begins. This decision will depend on the final construction methods and schedules of individual plans and projects, including VE.

1.2.4 This Outline SNS SAC SIP serves as a foundation for ongoing discussions and consultations involving the Applicant, the Marine Management Organisation (MMO), and SNCBs specifically, Natural England. These discussions aim to reach consensus on the specific mitigation measures required for VE. A Final SNS SAC SIP will be created closer to the construction phase, following revisions and further consultations. The requirement for compliance with the SNS SAC SIP is provided for within the dML.

1.3 CONSULTATION

1.3.1 The refinement of this Outline SNS SAC SIP will be an ongoing process, evolving from VE's application phase, through the examination phase, and after VE's determination. The Applicant will maintain active communication with the MMO and their advisors, Natural England, with the aim of addressing any concerns related to the SNS SAC SIP. The Final SNS SAC SIP will include details of the consultation undertaken.

2 FINAL DESIGN PLAN

2.1.1 The Final SNS SAC SIP will elaborate on the final design parameters of VE (see Volume 6, Part 2, Chapter 1: Offshore PD for current maximum design scenario (MDS) values) , outlining potential activities with noise implications that could affect the management thresholds associated with the SNS SAC.

2.1.2 Clearance of Unexploded Ordnance (UXO) before offshore construction is assessed in the DCO application (Volume 5, Report 4: RIAA and Volume 6, Part 2, Chapter 7: Marine Mammal Ecology) through the Outline Marine Mammal Mitigation Protocol (MMMP) for UXO Clearance (see Volume 9, Report 14.2), which is provided for information at this stage. However, UXO clearance will require a separate Marine Licence (ML) application once pre-construction surveys determine the quantity and type of UXO that needs to be cleared. This separate application will consider the SNS SAC, including the potential need for an SNS SAC SIP specifically related to UXO clearance operations.

2.1.3 The Final SNS SAC SIP will determine which plans and projects align with VE's construction schedule, thereby establishing the need for their inclusion in the in-combination assessment.

3 POTENTIAL MITIGATION AND MANAGEMENT MEASURES

3.1 OVERVIEW

3.1.1 The focus of specific mitigation options in this Outline SNS SAC SIP is limited to addressing potential disturbance to harbour porpoise resulting from the concurrent effects of other plans, projects, and activities combined with VE (see Volume 6, Part 2, Chapter 7: Marine Ecology for more details).

3.1.2 This document aims to identify currently available mitigation and management measures that could be implemented during the development of the Final SNS SAC SIP before Project construction. The goal is to ensure that the conclusion of no AEoI remains valid under all possible scenarios. While potential measures are discussed in this section, it is crucial to note that the confirmation of these measures cannot occur until the finalisation of project design parameters.

3.1.3 Table 2 in JNCC's Advice on SNS SAC Activities (2019) summarises piling-related mitigation options for disturbance and displacement effects. Primary mitigation includes adjusting piling schedules to minimise harbour porpoise exclusion when multiple developments occur simultaneously. Secondary mitigation involves using sound dampers and sound transfer barriers (e.g., bubble curtains and pile casings).

3.1.4 JNCC, Natural England & DAERA (2020) recommends allowing sufficient time between assessment and construction to implement additional mitigation measures if necessary. These measures may involve spatial planning and phasing of noisy activities, employing quieter installation methods, and leveraging technology to reduce sound levels and propagation.

3.1.5 Potential measures are outlined in this section of the Outline SIP, however, as previously noted, confirmation of any measure(s) that will be employed cannot be confirmed until project design parameters are finalised, and the management measures are known for the SNS SAC. At that point, the objectives of any necessary mitigation measures will become evident.

3.2 PRIMARY MITIGATION – MANAGEMENT OF ACTIVITIES

3.2.1 In the hierarchy of mitigation options, guidance from JNCC (2019) suggests evaluating the potential effectiveness of project-level commitments, such as management measures, in ensuring no AEoI. These measures might entail restricting daily and seasonal project activities or specifying the timing and spatial distribution of operations to minimise impacts.

3.2.2 The implementation of such management measures, where feasible and deemed necessary, would aim to collectively ensure that the thresholds for significant disturbance – defined as 20% of the relevant seasonal extents of the SAC within a single day and 10% across a season – are not surpassed.

3.2.3 These management measures could apply in various scenarios, including:

- On individual days when risk of threshold exceedance arises due to the cumulative effect of activities conducted by multiple projects (i.e., where VE alone does not cause threshold exceedance but when combined with other plans/projects, it poses a risk of AEoI), such as by imposing restrictions on the location or timing or project-level activities relative to the boundary of the SNS SAC; and

- When a risk of exceeding the seasonal threshold is identified through in-combination, by imposing limits on VE level activities to prevent exceeding the seasonal threshold.

3.2.4 An illustrative approach to managing project-level activities to meet these thresholds involves coordinating the scheduling of piling activities while considering other noise-generating activities that could potentially interact with VE. This strategy may also entail collaborative efforts with other projects and stakeholders to devise viable solutions for addressing regional-level in-combination challenges, both within the offshore wind sector and across other relevant industries. These examples offer potential mitigation strategies to mitigate spatial and temporal disturbances that could significantly impact harbour porpoise in this designated area.

3.2.5 Ultimately, the need for any such management measures will be determined and validated through the development of the Final SNS SAC SIP during the post-consent phase, prior to commencing the relevant licensed activities. This process will assess whether mitigation or management measures are required to ensure no AEoI, whether individually or in-combination. It is noted that the SIP requirement has been applied to numerous recent offshore wind farm DCOs in relation to the SNS SAC and have, through the discharge of those requirements, acted to confirm the findings of no AEoI alone or in-combination.

3.3 SECONDARY MITIGATION OPTIONS

3.3.1 In accordance with JNCC guidance (JNCC, 2019 and JNCC, Natural England & DAERA, 2020), the Applicant has the option to consider secondary mitigation measures while developing the Final SNS SAC SIP. This exploration becomes necessary if impacts cannot be adequately addressed through the primary measures previously outlined.

3.3.2 These secondary measures encompass a range of technical options that, when implemented individually or collectively, serve to minimise noise emissions during VE's construction. Two primary approaches are identified to mitigate noise levels resulting from piling installation: at-source modifications and barrier systems. At-source modifications involve altering the pile-driving procedures and equipment, including the adoption of alternative foundation types or installation methods. Additionally, the reduction of impact hammer force through the use of low-shock-wave methods are considered within this category.

3.3.3 Continual advancements in installation techniques for conventional monopile and pin pile foundations will also potentially reduce subsea noise emissions. The Applicant will assess the feasibility, considering both commercial and technical aspects, of alternative pling systems when defining the final project design. This design evolution would be informed by post-consent site investigations and ongoing technological developments.

3.3.4 Anti-noise barrier systems around the pile, can currently be categorised into the following main options:

- *Air Bubble Curtains:* Reflect acoustic waves and dampen them within an air bubble cloud, with effectiveness influenced by sound frequency and environmental conditions.
- *Pile Casings:* Minimise noise propagation by enclosing the pile within a casing.

- *Resonator-Based Noise Mitigation Systems:* Convert acoustic energy into vibrations within resonator units, absorbing noise through elements like encapsulated bubbles, foam, or Helmholtz-type resonators.

3.3.5 Combinations of these noise reduction principles can be employed if a single technique proves insufficient to meet acceptable noise limits. However, it's important to note that while some methods may reduce the sounds levels, they might also extend the overall duration of underwater noise disturbance during foundation installation, necessitating consideration of their efficacy.

3.3.6 It's important to acknowledge that the discussed techniques may not be exhaustive, as new technologies continue to emerge over time.

3.4 POPULATION MODELLING

3.4.1 If necessary, the development of the Final SNS SAC SIP may involve the use of population modelling techniques, such as Population Consequences of Disturbance (PCoD), Disturbance Effects of Noise on the Harbour Porpoise Population in the North Sea (DEPONS) or Dynamic Energy Budget (DEB). These models would enable the evaluation of the biological implications of disturbance caused by underwater noise and place the findings of quantitative assessments into the broader context of the porpoise population.

3.5 RE-VISITING THE IN-COMBINATION ASSESSMENT AGAINST UP-TO-DATE INFORMATION

3.5.1 When finalising the Final SNS SAC SIP a review of the information related to other plans and projects, which served as a basis for the cumulative impact assessment in the EIA and RIAA, may result in changes regarding the potential for AEoI. This entails updating assumptions concerning other relevant offshore works to align with their final design details, where available at the time of drafting the Final SNS SAC SIP. A comparison between the consented envelopes of offshore wind farms and the as-built scenarios illustrates that very few offshore wind farms in UK waters have been constructed to the full extent of their consent regarding piled foundations.

3.5.2 Moreover, project timelines for other plans and projects may vary, rendering them irrelevant in the cumulative assessment during the preparation of the Final SNS SAC SIP. Conversely, new projects may become relevant as construction dates for offshore wind farms or oil and gas seismic surveys evolve over time.

3.6 CURRENTLY UNFORESEEN FUTURE AND EMERGENT TECHNOLOGIES

3.6.1 The SIP process also accommodates the opportunity to assess and make use of future technologies or methodologies that may emerge. This ensures that any new, unforeseen technologies or methods arising before construction of VE are considered.

3.6.2 Given the time gap between offshore wind farm consent and construction commencement, coupled with rapid technological advancements, new measures may become available. The SIP is not limited to measures existing at the time of consent, if emerging measures remain within the design enveloped of the consent. However, efficacy information for these measures is currently unavailable, and their use and impact on the potential AEoI will be assessed in the Final SNS SAC SIP, subject to consultation with the MMO and Natural England.

3.7 ASSESSMENT OF EFFICACY OF MEASURES AND IMPLEMENTATION

3.7.1 Prior to implementing any project mitigation or management measures each mitigation or measure's efficacy, whether used alone or in-combination, will be assessed to ensure it can achieve the necessary reduction in harbour porpoise disturbance and maintain a conclusion of no AEoI.

3.7.2 Throughout this process, the MMO and their advisors (Natural England) will be consulted to guarantee the robustness of the mitigation and management measures and their efficacy assessment.

3.7.3 After assessing and selecting necessary project mitigation or management measures (alone or combined) to prevent AEoI in the SNS SAC, a Final SNS SAC SIP will be submitted to the MMO for consideration, in consultation with Natural England. Pending any required amendments, the SIP would then be submitted for MMO approval before commencing licensed activities.

3.7.4 The approved Final SNS SAC SIP will outline the delivery timeframe, implementation plan, and monitoring / reporting requirement for the mitigations or measures, including how non-compliance would be addressed.

4 ADDITIONAL LICENSING REQUIREMENTS

4.1.1 It is acknowledged that additional licences will be required where relevant (noisy) activities are undertaken during the construction of VE. As highlighted in the RIAA, such additional licences are expected to include (but may not be limited to):

- *European Protected Species (EPS) Licences:* It is expected than an injury license may be required for UXO clearance (if required), and for percussive piling for foundation installations; and
- *Additional Marine Licence:* If UXO clearance is required an additional Marine Licence covering the proposed UXO clearance activities will be submitted to the MMO prior to the commencement of UXO clearance.

4.1.2 The above licenses will be submitted to and discussed with the MMO and Natural England as part of the application process.

5 SUMMARY

5.1.1 The Final SIP will be used to identify and assess any potential management or mitigation measures that could ensure no AEoI on the SNS SAC for the significant disturbance of harbour porpoise based on the final design of VE. The Final SIP will also be used to record all consultation on the proposed project management or mitigation measures it contains.

6 REFERENCES

JNCC (2023), 'MNR Disturbance Tool: Description and Output Generation'. https://jncc.gov.uk/our-work/marine-noise-registry/ [Accessed October 2023].

JNCC, Natural England & the Northern Irish Department of Agriculture, Environment and Rural Affairs (DAERA) (2020), 'Guidance for Assessing the Significance of Noise Disturbance Against Conservation Objectives of Harbour Porpoise SACs (England, Wales and Northern Ireland)'. JNCC Report No. 654, JNCC, Peterborough, ISSN 0963-8091.

JNCC (2019), 'Harbour Porpoise (*Phocoena phocoena*) Special Area of Conservation: Southern North Sea Conservation Objectives and Advice on Operations'. March 2019. 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.

FIVE ESTUARIES
OFFSHORE WIND FARM

PHONE 0333 880 5306
EMAIL fiveestuaries@rwe.com
WEBSITE www.fiveestuaries.co.uk
ADDRESS Five Estuaries Offshore Wind Farm Ltd
Windmill Hill Business Park
Whitehill Way, Swindon, SN5 6PB
COMPANY NO Registered in England and Wales
company number 12292474