



Marine
Management
Organisation

Marine Licensing
Lancaster House
Hampshire Court
Newcastle upon Tyne
NE4 7YH

T +44 (0)300 123 1032
F +44 (0)191 376 2681
www.gov.uk/mmo

Five Estuaries Offshore Windfarm Case
Team
Planning Inspectorate
fiveestuaries@planninginspectorate.gov.uk

(Email only)

MMO Reference: DCO/2019/00008
Planning Inspectorate Reference: EN010115

03 October 2024

Dear Sir/Madam,

Planning Act 2008, Five Estuaries Offshore Wind Farm Ltd, Proposed Five Estuaries Offshore Wind Farm Order

Deadline 1 Submission

This document comprises the Marine Management Organisation's (MMO) Deadline 1 response in respect to the above Development Consent Order (DCO) Application. This is without prejudice to any future representation the MMO may make about the DCO Application throughout the examination process. This is also without prejudice to any decision the MMO may make on any associated application for consent, permission, approval or any other type of authorisation submitted to the MMO either for the works in the marine area or for any other authorisation relevant to the proposed development.

The MMO reserves the right to modify its present advice or opinion in view of any additional matters or information that may come to our attention.

Yours Faithfully

Nicola Wilkinson
Marine Licensing Case Manager

■ [REDACTED]
■ [REDACTED]@marinemanagement.org.uk

Copies to:

Emma Chalk (MMO) - Case [REDACTED] [@marinemanagement.org.uk](mailto:[REDACTED]@marinemanagement.org.uk)

Rebecca Reed (MMO) – Senior Case Manager:

[REDACTED]@marinemanagement.org.uk



Marine
Management
Organisation

...ambitious for our
seas and coasts





Contents

1	Comments on any submissions received at Pre-examination Procedural Deadlines A, B, C and D.....	3
1.1	PD4-006 Five Estuaries Offshore Wind Farm Ltd 10.4 Applicant's Response to Relevant Representations	3
1.2	Benefit of the Order	95
1.3	PD4-009 Five Estuaries Offshore Wind Farm Ltd 10.7 Notification of Intention to Submit a Change Request.....	102
1.4	PD-009 Rule 8 Notification of timetable for the examination.....	103





1 Comments on any submissions received at Pre-examination Procedural Deadlines A, B, C and D

1.1 PD4-006 Five Estuaries Offshore Wind Farm Ltd 10.4 Applicant's Response to Relevant Representations

4.17 MARINE MANAGEMENT ORGANISATION [RR-070] Ref	Topic	Relevant representation comment	Applicant's responses	MMO's Deadline 1 Comments
MMO-RR01	Gen - Planning	<p>Marine Plans</p> <p>The Applicant should demonstrate that they have considered whether the project adheres to all the relevant marine plans and policies in the area. The MMO recommends that this is presented in a single, coherent document instead of a number of separate references throughout the submission. The relevant marine plan policies that should be met can be identified using the Explore</p>	<p>The Applicant has drafted a Marine Plan Assessment document which will be submitted at Deadline 1. This will detail how VE is compliant with the South East Inshore, East Inshore and East Offshore Marine Plans.</p>	<p>The MMO welcome the inclusion of a stand alone Marine Plan Policy Assessment Document. We will aim to provide comments on the assessment for Deadline 2.</p>

		<p>Marine Plans tool and policy information on the following website: https://www.gov.uk/guidance/explore-marine-plans</p>		
MMO-RR02	Gen - Planning	<p>MMO requires the Applicant to detail how the proposed project is compliant with the relevant marine plans by producing a marine plan policy assessment in one document. Once a comprehensive marine plan assessment has been provided, the MMO will provide comment on this.</p>	See response to MMO-RR01	Noted.
MMO-RR03	Gen - Offshore DCO	<p>Benefit of the Order</p> <p>In the MMO's initial comments on the draft DCO/DML, provided to the Applicant on the 4 April 2024, the MMO raised concerns with the inclusion of this provision. The MMO still have significant concerns with Part 2 Article 7 of the DCO and Paragraph 7 of the DMLs. For the benefit of the Secretary of State, the MMO would like to reiterate our position on this below:</p> <p>It is the MMO's stated position that the DML granted under a DCO's should be regulated by the provisions of the Marine and Coastal Access Act 2009 (MCAA 2009), and in respect of this DCO application, specifically by all provisions of section 72 MCAA 2009.</p>	<p>The Applicant notes the MMO's position but does not agree.</p> <p>The drafting in the dDCO reflects a long established precedent regarding the transfer of DCO powers and deemed marine licences that has been considered acceptable by the Secretary of State many times, including most recently in the Sheringham Shoal and Dudgeon Extensions Offshore Wind Farm Order 2024.</p> <p>Where a transfer of a deemed marine licence is sought under Article 7(2), the Secretary of State would consider the context of all the provisions of the DCO being transferred. That process would be</p>	The MMO has addressed the Applicants in paragraph 1.2 of this response.

robust in ensuring a suitable approach is being taken.

There is a legal point to note as well that some Articles and Requirements relating to offshore matters within the DCO overlap with the deemed marine licence and it would not be appropriate for those to be transferred separately. In that context, it is appropriate that the Secretary of State has the ability to approve the transfer or grant of a deemed marine licence such that the transfer or grant can fully reflect the relevant DCO and deemed marine licence powers. It is undesirable to separate the transfer of the benefit of the order generally and the transfer of the benefit of the deemed marine licence as doing so could result in transfers occurring at different times and inconsistency in position. Having deemed the marine licence in the Order it is also appropriate that any transfer under that order include the deemed marine licence as part of the wider transfer – it is one element of the wider order powers and should not be separated out from the authority to construct, operate and maintain the NSIP granted by the order. In addition, it is common practice for an application to be made to MMO

			at the same time as to the Secretary of State in order to vary the terms of the marine licence to reflect the transfer or grant requested under Article 7.	
MMO-RR04	Gen - Offshore DCO	<p>PINS Guidance</p> <p>As set out in Advice Note Eleven, Annex B – Marine Management Organisation National Infrastructure Planning (planninginspectorate.gov.uk) where a developer chooses to have a marine licence deemed by a DCO, we, the MMO, “will seek to ensure wherever possible that any deemed licence is generally consistent with those issued independently by the MMO.”</p> <p>Developers can seek consent for a marine licence directly with the MMO, reinforcing that in respect of marine licences, the Development Consent Order (DCO) process is nothing more than a mechanism for granting a marine licence –it is not a vehicle to amend established process and procedures, such as those for the transfer of a marine licence.</p> <p>As the guidance further sets out, we, the MMO are responsible for enforcing</p>	As response to MMO-RR03.	The MMO has addressed the Applicants in paragraph 1.2 of this response.

		<p>marine licences regardless of whether these are 'deemed' by a DCO or consented independently, and it is therefore fundamental that all marine licences are clear and enforceable, and consistency is a key element in achieving this.</p> <p>Section 72(7)(a) MCAA 2009 permits a licence holder to make an application for a marine licence to be transferred, and where such an application is approved for the MMO to then vary the marine licence accordingly (section 72(7)(b))</p>		
MMO-RR05	Gen - Offshore DCO	<p>Application to transfer or lease</p> <p>In considering the proposed provisions of Article 7 DCO, Article 7(2), being read with Article 7(4) introduces a process involving the Secretary of State providing consent to the transfer in certain circumstances, rather than the MMO as the regulatory authority for marine licences considering the merits of any application for a transfer. The MMO note the proposed ability for the undertaker to lease the deemed marine licence for an agreed period of time – This specific power has been addressed separately below.</p> <p>As the process proposed by the applicant is a significant departure from the current statutory framework in relation to marine</p>	Please see response to MMO-RR03.	The MMO has addressed the Applicants in paragraph 1.2 of this response.

		<p>licences, it has not been tested, it may therefore be the case that the applicant/undertaker will face unnecessary delays following its application as it is not clear that the Secretary of State will have a process in place to deal with requests of this nature and it is not clear what any consultation period with the MMO would be.</p>		
MMO-RR06	Gen - Offshore DCO	<p>Duty to consult MMO</p> <p>It is noted that the Secretary of State “must consult” the MMO (Article 7(6)) – however the obligation goes no further than this, the Secretary of State is not obligated to take into account the views of the MMO in providing its consent and there is no obligation for the MMO to be informed of the decision of the Secretary of State nor the undertaker.</p> <p>In the regulatory sphere it strikes the MMO as highly unusual that a decision to transfer a marine licence or to lease is not the decision of the regulatory authority regulating in that area.</p>	<p>This drafting follows precedent including the recently made Sheringham Shoal and Dudgeon Extensions Offshore Wind Farm Order 2024 where an almost identical submission was made by the MMO and the wording of the equivalent article was specifically considered by the SoS. In that case the equivalent article as made (article 5) provides:</p> <p>“(6) The Secretary of State must consult the MMO before giving consent to the transfer of the benefit of the whole of any deemed marine licences under paragraph (3).”</p> <p>The Applicant accordingly submits that this issue has been considered by the SoS, precedent should be followed and that it is not for the Applicant to impose requirements on</p>	<p>The MMO has addressed the Applicants in paragraph 1.2 of this response.</p>

			<p>the SoS as to how they deal with any views expressed by the MMO.</p> <p>This drafting is well precedented and cannot reasonably be described as 'highly unusual' in the context of offshore wind DCOs. In addition to Sheringham as quoted above, this wording was also included in (as examples and not an exhaustive list) the Hornsea Four OWF Order 2023 (article 5(6)), Hornsea Three OWF 2020 (article 5(6)), East Anglia Three Offshore Wind Farm Order 2017 (article 5(3)) and the Galloper Wind Farm Order 2013 (article 7(2)).</p>	
MMO-RR07	Gen - Offshore DCO	<p>Power to vary the marine licence following a transfer</p> <p>Despite the proposed changes to the process of transferring a marine licence it remains that neither the licence holder/undertaker nor the Secretary of State has any power to actually vary any terms of a marine licence and it will still therefore be necessary for the MMO to take steps to vary a marine licence to reflect that it has been transferred to another entity. To our mind the proposed mechanism for transfer of a marine licence does not actually work and in fact does little more than complicate the process.</p>	<p>The Planning Act 2008 is clear that marine licences may be deemed in a DCO in appropriate areas (s149A) and that a DCO may include such further provisions ancillary to the operation of that deemed marine licence (s122(3)), including transfer along with the benefit. It is inarguable from the wording of section 122(5)(a) and (c) that a DCO may "apply, modify or exclude a statutory provision which relates to any matter for which provision may be made in the order" or "include any provision that appears to the Secretary of State to be necessary or expedient for giving full effect to</p>	<p>The MMO has addressed the Applicants in paragraph 1.2 of this response.</p>

		<p>There are also very real practical concerns as to how the proposed process would work in practice. The transfer of the licence would happen first, and then the marine licence would need to be varied. After the transfer of the licence, the new license holder/undertaker would have a marine licence which would still be in the name of the license holder/undertaker who had transferred the licence. The new license holder/undertaker would have no authorisation to carry out any acts until the variation had taken place and until the variation had been affected the original licence holder/ original undertaker would remain liable for any actions undertaken. The procedure under section 72 MCAA avoids this issue entirely.</p>	<p>any other provision of the order”. Deemed marine licences are clearly matter for which provision may be made in a DCO, section 72 MCAA 2009 is a provision relating to that deemed marine licence and the transfer power is accordingly authorised by s122 of the planning Act. The ability to transfer the deemed marine licence is related to the deeming and is submitted to be a sensible, expedient part of the wider power to transfer the benefit of the order.</p> <p>There is accordingly no legal barrier to including these provisions in the dDCO and there is strong precedent clear authority for its inclusion demonstrated set by DCOs in English waters on this position which has been repeatedly adopted by the Secretary of State and has not been subject to legal challenge as to its competency.</p>	
--	--	---	--	--

MMO-RR08	Gen - Offshore DCO	<p>Transfer of “any or all of the benefit”</p> <p>Article 7(2)(a) specifies the transfer of “any or all of the benefit of the provisions of this Order (including the deemed marine licence”. Article 72(7)(a) MCAA 2009 specifies: “On an application made by the licensee, the licensing authority which granted the licence – (a) may transfer the licence from the licensee to another person...”</p> <p>As can be seen above there is no concept within the regulatory framework of MCAA 2009 for a marine licence to be transferred (or indeed leased) ‘in part’. This proposal by the applicant creates a new power and an additional level of complexity. The MMO would be grateful if the Applicant could indicate why it considers the ability to either transfer or lease ‘in part’ necessary.</p> <p>The ability to transfer ‘part’ of a marine licence is a wholly new concept and would lack consistency with marine licences granted independently by the MMO – which would make a significant departure from the PINS guidance to applicants as set out above.</p> <p>The MMO objects to the provisions relating to the process of transferring and/or granting the deemed marine licences set out in the draft DCO at Part</p>	<p>The Applicant notes that there is precedent for excluding deemed marine licences from this sub-paragraph and is considering the wording used</p>	<p>The MMO has addressed the Applicants in paragraph 1.2 of this response.</p>
----------	--------------------	---	---	--

		2, Article 7 insofar as these are intended to apply to the MMO and requests paragraphs 7(6) and 7(9) be removed in their entirety, with a clarification added to specifically exclude these provisions from applying to the MMO (with corresponding wording amended in the Deemed Marine Licences).		
MMO-RR09	Gen - Offshore DCO	Grant to a lessee of a deemed marine licence Article 7(2)(b) specifies a grant to a lessee for an agreed period of “any or all of the benefit of the provisions of the Order (including the deemed marine licences)”	The Applicant notes that there is precedent for the relevant term for this purpose to be ‘transferee’ not lessee, and is considering if this wording can be amended An updated draft DCO is anticipated to be submitted at Deadline 1.	The MMO has addressed the Applicants in paragraph 1.2 of this response.
MMO-RR10	Gen - Offshore DCO	‘Leasing’ There is however no mechanism either in the DCO or indeed in MCAA 2009 for a marine licence to be ‘leased’, specifically there is no provision for the licence ‘reverting’ to the licence holder after the agreed lease period – in practical terms it would be necessary to vary the marine licence to change the details of the licence holder at the beginning of the agreed period and then again at the end of the agreed period. It is not clear why the applicant considers it necessary to introduce the ability to ‘lease’ the whole or part of a deemed marine licence and we	See response to MMO-RR09. In addition, the Applicant notes that this wording is well precedented and wording to this effect has been included in DCOs for a considerable period of time. It is accordingly not accepted that there are ‘significant practical implications should this power be created in the DCO’ as this power has been being created in DCOs for over a decade and numerous deemed marine licences will have been transferred in that time.	The MMO has addressed the Applicants in paragraph 1.2 of this response.

		<p>should be grateful for any clarity on this issue.</p> <p>There are significant practical implications should the power to lease be created in this DCO as there is no procedure in place to affect such a lease. Any such lease would require a transfer or variation to allow lessee to claim the benefit of the licence, and then at the end of the lease period the marine licence would need to be varied to transfer it back to the lessor. Further information is required from the applicant as to the detail of this process, for example is it anticipated that the return of the licence to the lessor to be automatic and what would the process be if the lessee refused to transfer the marine licence back.</p>		
MMO-RR11	Gen - Offshore DCO	<p>Article 7(2)(b) use of the term 'grant'</p> <p>The MMO would be grateful for clarification on the use of the term 'grant' in Articles 7, specifically 7(2)(b) in respect of granting the benefit of the marine licence to a lessee. Article 7(2)(a) refers to the transfer of the marine licence -as is the language of Article 72 MCAA 2009. As the granting of marine licences fall under section 69 MCAA and not section 72, can the applicant provide further explanation of it intention in this regard and its use of the term?</p>	<p>This wording is well precedented and wording to this effect has been included in DCOs for a considerable period of time. That the term is not used in the MCAA 2009 is not relevant as the Order would be granted under the Planning Act 2008.</p>	<p>The MMO has addressed the Applicants in paragraph 1.2 of this response.</p>

MMO-RR12	Gen - Offshore DCO	<p>Enforcement</p> <p>It is essential as the regulatory authority in the marine environment that the MMO is always fully aware who has the benefit of marine licence in order that it can carry out its regulatory function and where necessary take enforcement action. The mechanism the applicant is currently proposing for the transfer of a marine licence departs from this established process without clear justification as to why such a departure is necessary or appropriate in the circumstances.</p>	<p>The justification for inclusion has been set out in responses to RR06 and RR07 in response.</p>	<p>The MMO has addressed the Applicants in paragraph 1.2 of this response.</p>
MMO-RR13	Gen - Planning	<p>Conclusion</p> <p>It is firmly the MMOs position that the current regulatory framework should prevail, specifically that only a transfer of the whole of a marine licence should be permitted and not part of it and the transfer should be left entirely to the MMO to process outside of the Nationally Significant Infrastructure Project process. The provisions currently proposed by the applicant raise several significant issues and complicates a what is a straightforward and well-established statutory process and the MMO can see little or no benefit to this.</p>	<p>The MMOs position is noted but not agreed with and is submitted to be out of step with precedent and the SoS's recent decision making on this issue.</p> <p>The concept that the MCAA should prevail is contrary to the intention and drafting of the Planning Act 2008. If the MCAA was to prevail in all cases the inclusion of a deemed marine licence in a DCO would not be acceptable, however it is explicitly provided for in line with the ethos of streamlining consents.</p>	<p>The MMO has addressed the Applicants in paragraph 1.2 of this response.</p>

		<p>The MMO is concerned that the procedure proposed represents an unnecessary duplication of the existing statutory regime set out in s72 of the Marine and Coastal Access Act 2009 and that it will give rise to significant enforcement difficulties for the MMO. The MMO also considers that it has the potential to prejudice the operation of the system of marine regulatory control in relation to the proposed development. The MMO also regards the proposed procedure as cumbersome, more administratively burdensome, slower and less reliable than the existing statutory regime set out in s72 of the 2009 Act.</p> <p>The MMO considers that little advantage is gained for the Applicant by these provisions and the tangible risks and disadvantages that it poses can be avoided by retaining the existing statutory regime in full.</p>		
MMO-RR14	Gen - Planning	<p>Materiality</p> <p>The MMO has concerns on the use of materiality within the DCO's, the MMO's position is summarised below:</p> <p>The MMO strongly considers that the activities authorised under the DCO and DML should be limited to those that are assessed within the Environmental Impact Assessment ("EIA"), and so the</p>	<p>This wording is well precedented and commonly included in DCOs. It is included in the Sheringham and Dudgeon DCO (2024), which provides in it DMLs in Part 1:</p> <p>"8(2) Any amendments to or variations from the approved details, plans or schemes must be in accordance with the principles and</p>	<p>The MMO has addressed the Applicants in paragraph 1.2 of this response.</p>

		<p>statement within the DML “Such agreement may only be given where it has been demonstrated to the satisfaction of the MMO that it is unlikely to give rise to any materially new or materially different environmental effects from those assessed in the environmental statement” should be updated to clarify this.</p> <p>The intention behind EIA is to protect the environment by ensuring that in deciding whether to grant a development consent for a project, and in deciding what conditions to attach to that consent, the decision has full knowledge of what the likely significant environmental effects of the project/development will be. That knowledge then guides the consent process and what conditions, if any, to attach to the consent. Additionally, there is considerable public consultation under the EIA process because the process recognises the importance of local knowledge in environmental decision making.</p>	<p>assessments set out in the environmental statement and approval of an amendment or variation may only be given where it has been demonstrated to the satisfaction of the MMO that it is unlikely to give rise to any materially new or materially different environmental effects from those assessed in the environmental statement.</p> <p>It is necessary in DCO projects to allow for a degree of flexibility, importantly to allow the use of new or improved construction methods or emerging technologies.</p> <p>Allowing actions which can be demonstrated not to have materially new or different environmental effects cannot be contrary to the EIA as</p>	
MMO-RR15	Gen - Offshore DCO	<p>Site Integrity Plan</p> <p>The MMO note the works are taking place within the Southern North Sea Special Area of Conservation (SNS SAC), designated for harbour porpoise, which are an Annex II Species particularly sensitive to noise.</p>	<p>Condition 12(1)(j) of part 2 of schedule 10 requires the submission and approval of southern north sea special area of conservation site integrity plan which accords with the principles set out in the outline southern north sea special area of conservation site integrity plan (the</p>	Noted

	<p>Due to this sensitivity, the Joint Nature Conservation Committee (JNCC) issued guidance in June 2020 regarding the impacts of noise within the SAC. This guidance can be found at:https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/889842/SACNoiseGuidanceJune2020.pdf</p> <p>In order to avoid an Adverse Effect on Site Integrity (AEOI) JNCC have outlined that noise disturbance that impacts or is within an SAC from a plan/project, individually or in combination with other plans and projects, is considered to be significant if it excludes harbour porpoises from more than:</p> <ul style="list-style-type: none">•20% of the relevant area of the site in any given day, <p>or</p> <ul style="list-style-type: none">•an average of 10% of the relevant area of the site over a season <p>These are known as daily and seasonal thresholds respectively.</p> <p>In order to manage noise, and therefore impact, to the SNS SAC, it was agreed that any DCO's for offshore wind are required to include a condition within the DML which requires submission of</p>	<p>draft of which is 9.15 Outline Southern North Sea Special Area of Conservation Site Integrity Plan [APP-246].</p>	
--	---	--	--

MMO-RR16	Gen - Offshore DCO	<p>Site Integrity Plan</p> <p>Therefore the MMO request the following to be included within the DML: Interpretation to include:</p> <p>“JNCC Guidance” means the statutory nature conservation body ‘Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs’ Joint Nature Conservation Committee Report No.654, May 2020 published in June 2020 as amended, updated or superseded from time to time;”</p> <p>SNS SAC SIP Condition:</p> <p>(1) No piling activities can take place until a Site Integrity Plan (SIP), which accords with the principles set out in the in principle XX Project Southern North Sea SAC Site Integrity Plan, has been submitted to, and approved in writing, by the MMO in consultation with the relevant statutory nature conservation body.</p> <p>(2) The SIP submitted for approval must contain a description of the conservation objectives for the Southern North Sea Special Area of Conservation (SNS SAC) as well as any relevant management measures and it must set out the key statutory nature conservation body advice on activities within the SNS SAC relating</p>	<p>On interpretation, the Applicant will add the JNCC guidance to the next revision of the dDCO.</p> <p>On the SNS SAC SIP condition noted by the MMO, the Applicant has provided 9.15 Outline Southern North Sea Special Area of Conservation Site Integrity Plan [APP-246], a draft outline Site Integrity Plan which is intended to provide this level of detail and is not therefore proposing any change to the condition. The Applicant is reviewing the draft outline plan to ensure that all the points raised are covered and will submit a further response on the detail in due course.</p>	<p>Noted. The MMO welcome the signposting to the Outline Southern North Sea SAC SIP, which we are currently reviewing. The MMO aim to provide comments on this document for Deadline 3.</p>
----------	--------------------	--	--	---

		<p>to piling as set out within the JNCC Guidance and how this has been considered in the context of the authorised scheme.</p> <p>(3) The SIP must be submitted to the MMO no later than six months prior to the commencement of the piling activities.</p> <p>(4) In approving the SIP the MMO must be satisfied that the authorised scheme at the preconstruction stage, in-combination with other plans and projects, is in line with the JNCC Guidance.</p> <p>(5) The approved SIP may be amended with the prior written approval of the MMO, in consultation with the relevant statutory nature conservation body, where the MMO remains satisfied that the Project, in-combination with other plans or projects at the pre-construction stage, is in line with the JNCC Guidance.”</p>		
MMO-RR17	Gen - Offshore DCO	<p>As a minimum the SIP should include the following sections:</p> <p>Introduction</p> <p>Purpose of this document</p> <p>Project Background</p> <p>The Southern North Sea SAC</p> <p>Requirements for this Document</p> <p>Consultation</p>	<p>The Applicant notes the structure set out by the MMO. The content and structure of the final SIP will be discussed with the MMO post-consent.</p> <p>It should be noted that the outline SIP does not consider UXO as any UXO clearance will be licenced separately.</p>	<p>The MMO note the Applicants comments regarding the proposal to seek consent for any UXO clearance works separately.</p>

		Schedule for Agreement Southern North Sea SAC for Harbour Porpoise Conservation Objectives		
MMO-RR18	Gen - Offshore DCO	DCO - Part 1 (2): Under Buoys “LiDAR” should be spelt with a lowercase “l”	The Applicant will make this change in the next revision of the dDCO.	Noted
MMO-RR19	Gen - Offshore DCO	Part 1 (2): Definition for cables should be included or a justification as to why they are not included should be provided. The MMO recommend the following wording: “cable” includes cables for the transmission of electricity and fibre-optic cables;	The Applicant notes that cables are defined in article 2. The Applicant will add a definition to the dMLs in the next revision of the dDCO.	Noted
MMO-RR20	Gen - Offshore DCO	Part 1 (2): Under “cable crossings” it is not clear what other existing infrastructure could be”. Please can further information be provided on this and clarification provided in the definition.	This is intended as a catch all for any existing infrastructure in place. This may include for example, third party cables or pipelines.	Noted. The MMO recommend that additional text is provided within the definition.
MMO-RR21	Gen - Offshore DCO	Part 1 (2): Under “commence”. Is there any proposed monitoring to be carried out prior to the commencement of licensed activities?	Yes, this is covered by the in-principle monitoring plan [APP-265].	Noted.
MMO-RR22	Gen - Offshore DCO	Part 1 (2): Defence Infrastructure Organisation Safeguarding – Would be best to have addresses under Part 1 (4) of Schedule 10, for continuity purposes.	This will be amended in the next revision of the dDCO.	Noted.

MMO-RR23	Gen - Offshore DCO	Part 1 (2): Definition for Defra. The MMO note that this does not appear within DML or DCO so suggest it is removed from the interpretations.	This will be amended in the next revision of the dDCO.	Noted.
MMO-RR24	Gen - Offshore DCO	Part 1 (2): The MMO do not agree with the definition of “maintain”.	The Applicant would request that the MMO provide further detail on this point in order to allow it to consider the drafting.	The MMO recommend that the definition of maintain is amended to remove references to ‘adjust’ and ‘alter’. The current definition is not in-line with the MMO’s interpretation of maintain/maintenance which is as follows; ‘upkeep or repair an existing structure or asset wholly within its existing three-dimensional boundaries.
MMO-RR25	Gen - Offshore DCO	<p>Part 1: Definition’s should align within the document. Definition for MMO Is different in the DCO and DML:</p> <p>DCO Part 1 (2) Interpretations: “Marine Management Organisation” or “MMO” means the Marine Management Organisation being the body created under the 2009 Act and who is responsible for the monitoring and enforcement of the deemed marine licences;</p> <p>DML Part 1 (2): “Marine Management Organisation” or “MMO” means the Marine Management Organisation, Lancaster House, Hampshire Court, Newcastle upon Tyne, NE4 7YH who is the body created under the 2009 Act and</p>	This will be amended in the next revision of the dDCO.	Noted.

		<p>who is responsible for the monitoring and enforcement of this licence”</p> <p>The MMO recommend that the address is removed from schedule 10 & 11, as this is noted in Part 1 (4) of the DML’s</p>		
MMO-RR26	Gen - Offshore DCO	Part 1 (2): The MMO recommend a definition should be included for the MMO’s Marine Case Management System (MCMS), and reference should be made to MCMS for submissions of post-consent documentation or notification.	This will be amended in the next revision of the dDCO.	Noted.
MMO-RR27	Gen - Offshore DCO	Part 1(3) For scour protection the MMO highlights that scour protection has been used to stabilise the use of jack-up barges in similar offshore wind farm locations and the MMO would like further clarification if the Applicant will be intending to do similar within the Project.	Based on the ground conditions and experience from Galloper it is not expected to be needed; however this will only be confirmed post-consent following further surveys and vessel procurement.	Noted.
MMO-RR28	Gen - Offshore DCO	Part 1(4) In addition to this the MMO would like clarity on where the disposal volumes for drill arisings in connection with any foundation drilling are within the draft DCO (dDCO)/DML. The MMO believes that drill arising should be explicitly stated within the dDCO/DML and the following section should be included in the above Article:	The Applicant will include this in the revised dDCO submitted at Deadline 1.	Noted.

		disposal of drill arisings in connection with any foundation drilling up to a total of XX cubic metres.		
MMO-RR29	Gen - Offshore DCO	Part 2(d): The MMO note that the removal of sediment samples is set out briefly, however, the MMO consider more detail on how this process should operate is required.	The Applicant considers that appropriate detail is already provided for through the pre-construction monitoring plan, which requires approval from the MMO under condition 13 of part 2 (schedule 10), and condition 14 of part 2 (schedule 11).	Noted. This is currently being reviewed by the MMO
MMO-RR30	Gen - Offshore DCO	Part 2 (1)(2)(c): Should this be MHWS's rather than MHW. This should be amended for consistency.	The Applicant notes that the reference made appears to be incorrect or out of date as the referenced section in the submitted dDCO reads " (c) be less than 28 metres from MHWS to the lowest point of the rotating blade; and".	Noted
MMO-RR31	Gen - Offshore DCO	Part 2(1)(7): Where it notes "The total volume of scour protection material for wind turbine generator foundations must not exceed 1,582,040 cubic metres". Can the maximum volume of scour protection per turbine and per each structure be included as well as the total combined volume?	The Applicant does not consider this is required. Total volume has been consistently used in offshore wind DCOs as the maximum design scenario. It would be of assistance if the MMO could explain why they consider this detail is necessary and what the need is for the additional control it provides over the volumes already given.	The MMO have requested this information as it is important to ensure that the Deemed Marine Licence accurately reflects the maximum design parameters that have been assessed within the Environmental Statement. This is to provide certainty that should the project be consented, it is clear within the Deemed Marine Licence how much scour protection is to be placed at each turbine.

MMO-RR32	Gen - Offshore DCO	Part 2 (8): Can “of Seafish” be included after “Kingfisher Information Service” and the email address: kingfisher@seafish.co.uk. “of Seafish” should be included elsewhere in the DML’s where the Kingfisher Information Service has been referenced.	This will be amended in the next revision of the dDCO.	Noted.
MMO-RR33	Gen - Offshore DCO	Part 2 (8)(a): Should be “Kingfisher Fortnightly Bulletin”	This will be amended in the next revision of the dDCO.	Noted.
MMO-RR34	Gen - Offshore DCO	Part 2 (7): The MMO request the inclusion of a provision within the DML that notification to the MMO of incorrect notification is required. The MMO suggest the following wording is included: Should the undertaker become aware that any of the information on which the granting of this licence was based was materially false or misleading, the undertaker must notify the MMO of this fact in writing as soon as is reasonably practicable. The undertaker must explain in writing what information was material false or misleading and must provide to the MMO the correct information.	This will be amended in the next revision of the dDCO.	Noted.
MMO-RR35	Gen - Offshore DCO	With respect to any condition which requires the licensed activities to be carried out in accordance with the plans, protocols or statements approved under this licence, the approved details, plan or	The Applicant is reviewing this point.	Noted. The MMO is open to discussion should the Applicant have any questions.

		<p>scheme are taken to include any amendments that may subsequently be approved in writing by the MMO.</p> <p>Subsequent to the first approval of those plans, protocols or statements provided it has been demonstrated to the satisfaction of the MMO that the subject matter of the relevant amendments does not give rise to any materially new or materially different environmental effects to those assessed in the environmental information.</p>		
MMO-RR36	Gen - Offshore DCO	<p>Part 2: The undertaker must ensure that the MMO, the MMO Local Office, I fishermen's organisations and the Source Data Receipt Team at the UKHO Taunton, Somerset, TA1 2DN (sdr@ukho.gov.uk) are notified within five days of each instance of cable repair, replacement or protection replenishment activity.</p>	<p>This is already included in the submitted DCO at Part 2 paragraph 6(15).</p>	Noted
MMO-RR37	Gen - Offshore DCO	<p>Part 2: The following condition should be included:</p> <p>Any jack up barges or vessels utilised during the licensed activities, when jacked up, must exhibit signals in accordance with the UK Standard Marking Schedule for Offshore Installations.</p>	<p>This is already included, please see part 2 condition 7(6) of schedules 10 and 11.</p>	Noted.

MMO-RR38	Gen - Offshore DCO	Part 2 (10)(2): This should also include reference to the “Environment Agency Pollution Prevention Control Guidelines”	The Applicant requests the MMO provide the specific guideline referred to. EA pollution prevention guidelines were withdrawn in December 2015.	Updated guidance on pollution prevention can be found here: Pollution prevention for businesses - GOV.UK (www.gov.uk)
MMO-RR39	Gen - Offshore DCO	Part 2 (10)(4): The MMO Consider that it would be unrealistic to expect submissions to be submitted to the MMO on the last day of the reporting period. As such the 15th of the following month is reasonable and in-line with other DCO’s (e.g. 15 February and 15 August respectively).	The Applicant will make this amendment in the next revision of the dDCO.	Noted.
MMO-RR40	Gen - Offshore DCO	Part 2 (10)(10): There is currently no timeframe in which to report to the MMO –The standard timeframe recommended is 24 hours and is in line with other DCO’s.	The Applicant is considering the timeframe in which it is practical to submit notifications as it is concerned that 24 hours is too little.	Although 24 hours is the standard timeframe the MMO is happy to discuss this with the Applicant.
MMO-RR41	Gen - Offshore DCO	Part 2 (11)(1): Force Majeure. The MMO do not consider that this provision is necessary as section 86 of MCAA provides a defence for action taken in an emergency in breach of any licence conditions. The MMO require justification or rationale as why this provision is considered necessary.	The Applicant does not agree that this wording is not necessary because Section 86 provides a defence for actions taken in an emergency – this condition is about notifying of a deposit in those circumstances. It does not overlap with s86 which will still apply. No change to the dDCO is proposed.	The MMO has previously requested the removal of this clause as it unnecessarily duplicates the effect of s.86 of the 2009 Act. If it is to be retained, then the relationship between this clause and section 86 of the 2009 Act should be clarified.
MMO-RR42	Gen - Offshore DCO	Part 2 (15)(2): No timeframe in which to report to the MMO – recommend 24	The Applicant is considering the timeframe in which it is practical to	As previously noted the MMO is open to discussion should the Applicant wish to discuss this.

		hours is appropriate (“at least 24 hours before...”)	submit notifications as it is concerned that 24 hours is too little.	
MMO-RR43	Gen - Offshore DCO	Part 2 (16)(5): Please include a timeframe e.g. 6 months	<p>The Applicant proposes that, rather than trying to define a timeframe now, the timeframe for reporting has to be approved as part of the approval of the surveys. This would follow the approach taken in the Sheringham DCO (2024) which is:</p> <p>(4) The undertaker must carry out the surveys agreed under subparagraph (1) and provide the agreed reports to the MMO in the agreed format in accordance with the agreed timetable, unless otherwise agreed in writing with the MMO in consultation with the relevant statutory nature conservation bodies.</p> <p>An amendment will be proposed in the next revision of the dDCO.</p>	The MMO considers this to be a pragmatic approach and is satisfied with the proposed amendment.
MMO-RR44	Gen - Offshore DCO	<p>Part 2 (17): Construction monitoring. Can the following provision be included:</p> <p>The results of the initial noise measurements monitored in accordance with subparagraph 17(2)(b) must be provided in writing to the MMO within six weeks of the installation (unless otherwise agreed) of the first four piled foundations of each piled foundation type.</p>	The Applicant is considering this request and precedent wording and will respond at Deadline 1.	Noted.

		<p>The assessment of this report by the MMO will determine whether any further noise monitoring is required. If, in the opinion of the MMO in consultation with the statutory nature conservation body, the assessment shows impacts significantly in excess to those assessed in the environmental statement and there has been a failure of the mitigations set out in the marine mammal mitigation protocol, all piling activity must cease until an update to the marine mammal mitigation protocol and further monitoring requirements have been agreed.</p>		
MMO-RR45	Gen - Offshore DCO	<p>Part 2(18)(2)(b): Please include a timeframe, the MMO recommend 12 months for this survey to be undertaken.</p>	<p>The Applicant has included a timeframe in the draft DCO, it is currently specified as “three consecutive years”.</p>	<p>Noted.</p>
MMO-RR46	Gen - Offshore DCO	<p>Part 2(18): Please include the following provision:</p> <p>In the event that the reports provided to the MMO under sub-paragraph (4) identify a need for additional monitoring, the requirement for any additional monitoring will be agreed with the MMO in writing and implemented as agreed.</p>	<p>The Applicant would request that the MMO provide further detail on this point including why this is considered to be necessary in this case in order to allow it to consider.</p>	<p>The MMO considers this necessary as it provides certainty that should the monitoring not show favourable recovery, then there is a provision for remediation written into the Deemed Marine Licence</p>
MMO-RR47	Gen - Offshore DCO	<p>Part 2: Completion of construction. Please can the following provision be included:</p>	<p>The Applicant is checking that this would not duplicate existing provisions under the conditions and outline plans. It has no objection in</p>	<p>Noted. The MMO is open to discussion regarding this provision should the Applicant have any questions.</p>

		<p>Reporting of scour and cable protection;</p> <p>(1) Not more than four months following completion of the construction of the authorised project, the undertaker must provide the MMO and the relevant statutory nature conservation bodies with a report setting out details of the cable protection and scour protection used for the authorised project.</p> <p>(2) The report must include the following information—</p> <p>(a) the location of cable protection and scour protection;</p> <p>(b) the volume of cable protection and scour protection; and</p> <p>(c) any other information relating to the cable protection and scour protection as agreed between the MMO and the undertaker.</p>	<p>principle to the substance of the request but will respond on the drafting in due course.</p>	
MMO-RR48	OffS - Marine Water Quality	<p>The MMO have identified a number of information gaps which have been detailed below. The MMO, therefore, defers comment on conclusions relating to likely significant effects until information gaps concerning the sediment data are resolved (see paragraphs 4.1.2-4.1.11).</p>	<p>The Applicant considers there to be sufficient information provided for a robust, appropriate and proportional assessment of the baseline environment allowing for conclusions to be made confirming the Applicant's stance of no significant effects.</p>	<p>Applicants position noted.</p>
MMO-RR49	OffS - Marine	<p>MMO raised previous concerns regarding the Preliminary Environmental</p>	<p>This is noted by the Applicant. As presented in Table 3.2 of 6.2.7</p>	<p>Noted.</p>

Water Quality	<p>Information Report (PEIR), which mostly related to the collection of sediment samples to support the ES, and the minor comments requiring attention or recommending action are quoted as follows:</p> <p>i. “The locations of contaminant sample stations appear to be tangentially representative of the North and South Arrays. It appears that only those stations which contained “fines” have been tested, which the MMO presumes to be sediment with $\leq 63\mu\text{m}$ diameter. However, the MMO note that both sites FE1_02 and FE2_06 – which were not tested for contaminants, also contain similar levels of fine material to site FE2_01 (which was tested for contaminants). The MMO do not see the rationale of not testing for contaminants at these sites and request further clarification from the Applicant.</p> <p>ii. Whilst the contaminant results presented indicate very low levels, the number of samples is less than adequate.</p> <p>iii. As with the Arrays and Interconnector, the MMO do not see the rationale of only testing eight sample stations for contaminants when more than eight samples along the export cable corridor (ECC) have a notable proportion of fine material. For example, sample stations prefixed “FE5” comprise ten sample</p>	<p>Marine Water and Sediment Quality [APP-072], discussions were held with Cefas following responses consultation on the PEIR to gain further guidance on the appropriateness of the number of samples given that it was considered unlikely that additional samples would provide further clarity or additional information in terms of contamination levels. Consistently low contaminants are seen across the region, as presented in Section 3.6 of 6.2.7 Marine Water and Sediment Quality [APP-072]. Following the discussion with Cefas, the Applicant did not receive the requested feedback prior to the submission of the Application.</p> <p>Further response, as requested by the MMO, is provided in MMO-RR 50 for 4.1.2 i and iii and MMO-RR51 for 4.1.2 ii below.</p>	
---------------	---	--	--

		<p>stations, of which only one was tested for contaminants, but all of which contain a not insignificant level of fine material.</p> <p>iv. The MMO cannot find any justification as to the apparent exclusion of polybrominated diphenyl ethers from the applicant's sampling regime. Whilst it may be the case that this contaminant group is unlikely to exhibit elevated levels in offshore sediments, the MMO would at least have expected some kind of scoping to justify its exclusion. As this is only the PEIR, the MMO do not consider this to be essential to resolve the PEIR consultation, but we would expect some detail in the Environmental Statement."</p>		
MMO-RR50	OffS - Marine Water Quality	<p>Comments 4.1.2 i and iii do not appear to have been actioned. The Array area contains two samples which contain fine material (FE1_02 and FE2_05) which were not analysed for contaminants (compared to three samples which were). The MMO cannot locate any justification as to why these samples were not tested for contaminants, and based on the contaminant sampling undertaken, the southern array area ("FE2") is not characterised for contaminants in any capacity. The cable corridor area contains 35 samples which contain fine material, of which only eight were tested for contaminants, and 27 which were not.</p>	<p>The survey strategy was designed to target those sediments with the greatest predicted mud content as detailed within Section 2.2 of 6.5.5.1, Main Array Benthic Ecology Monitoring Report [APP-119]. The Applicant notes that the array area is predominately sand/ gravel in composition with an absence of fine (mud) material.</p> <p>In reference to those array samples identified by the MMO to contain fine material (FE1_02 and FE2_05), the Applicant would like to offer the following explanation for not</p>	<p>The MMO welcomes the additional information and clarification provided by the Applicant. The MMO are currently reviewing the information provided and will provide a response for Deadline 3.</p>

analysing these samples for the absence/ presence of contaminants:

All samples analysed within the array area contained a mud fraction greater than 6% in composition. Sample FE1_02 contained a mud fraction of less than 6%, with gravel and sand components of 59.6% and 34.6%, respectively; Sample FE2_05 contains no mud fractions, with gravel and sand representing 1% and 98.9%, respectively; and Sample FE2_06, which has not been highlighted by the MMO, contains gravels, sands and muds of 59.2%, 35.8% and 4.9%, respectively.

Given that the array area can be characterised as having low contamination levels and that the samples analysed all returned contaminant levels less than the Cefas Action Level 1, with the exception of Arsenic which is typical for this offshore environment and as recognised by the MMO in the S42 responses (Table 3.2 of 6.2.7 Marine Water and Sediment Quality [APP-072]), it is considered that additional samples would not provide further clarity or additional

information in terms of contamination levels.

Within the ECC, the eight samples analysed for contaminants contained a fine fraction within the range 8.8% and 84.3% of the total sample. All contaminant samples returned for the ECC were below Cefas Action Level 2 with only four stations recording exceedances of Action Level 1:

- Sample FE4_02_50m contained a mud fraction of 14.82%, with AL1 exceedances for Arsenic and Nickel;
 - Sample FE4_05 contained a mud fraction of 8.53% with AL1 exceedances in Arsenic, Cadmium and Nickel.
 - Sample FE5_09 contained a mud fraction of 71.07% and recorded exceedances of AL1 in Arsenic, Chromium and Nickel
 - Sample FE7b_02 contained the largest fines percentage within the ECC of 84.15% and recorded exceedances of AL1 in Arsenic and Nickel.

The Applicant considers that additional samples would not provide further clarity or additional

			<p>information given the contamination levels in the region can be characterised as low even when high mud percentages are considered.</p>	
MMO-RR51	OffS - Marine Water Quality	<p>For comment 4.1.2 ii, the number of samples does not appear to have changed since the Section 42 response. The number of samples tested for remains low.</p> <p>As these comments appear to have been unactioned, the MMO considers the cable corridor is inconsistently and insufficiently characterised. Therefore, we ask for justification on comments 4.1.2 i-iii.</p>	<p>The Applicant confirms no additional sampling has occurred since the S42 response however, it is the position of the Applicant that a robust and proportionate characterisation of the baseline has been defined in the assessment.</p> <p>The contaminants sampling referred to in comment 4.1.2 ii is provided in further detail in Section 2.2 and Table 4.4 of 6.5.5.1 Main Array Benthic Ecology Monitoring Report [APP-119] and Sections 2.2.1, 2.2.2 and Tables 4.5 and 4.7 of 6.5.5.2, Export Cable Route and Intertidal Benthic Ecology Monitoring Report [APP-120].</p> <p>PSA results are also detailed within Section 3.6 of 6.2.7 Marine Water Sediment Quality [APP-072].</p> <p>Extensive consultation regarding the methodology and scope of the surveys was undertaken prior to commencement. Following this</p>	<p>Noted. The MMO welcome the additional clarification provided and aims to provide further comments for Deadline 3.</p>

			consultation, the agreed survey strategy was performed.	
MMO-RR52	OffS - Marine Water Quality	The MMO notes that comment 4.1.2 iv appears to have been actioned as Polybrominated Diphenyl Ethers (PBDE) data are available for both sediment datasets (array and cable corridor).	This statement is welcomed by the Applicant.	Noted.
MMO-RR53	OffS - Marine Water Quality	<p>Section 3.6.33 onwards (pp 51) of ES Volume 6.2.3, Chapter 7 Marine Water Sediment Quality, describes intertidal sediment sampling with samples taken at 23 locations, and then details the contaminant results which comprise a subset of three intertidal samples.</p> <p>The report does not detail the locations of these samples within the intertidal area, in the way that it does with the array and cable corridor. A lack of spatial information for these samples critically limits the utility of the data. Therefore, the MMO asks for further detail on these locations.</p>	<p>The co-ordinates of all the intertidal sampling transect locations (high, mid and low water) are provided in Easting and Northing format under the geodetic parameter WGS 84, UTM 31N, 3°E [m] within Table 4.1 and presented spatially in Figure 2.1 of 6.5.5.2 Export Cable Route and Intertidal Benthic Ecology Monitoring Report [APP-120].</p> <p>No exceedances of quality guidelines were identified within the contaminant samples for the intertidal region as stated in Section 3.7.33 and Table 3.11 of 6.2.7 Marine Water Sediment Quality [APP-072].</p>	Noted.
MMO-RR54	OffS - Marine Water Quality	It would also be useful if the Applicant would confirm why only three samples were tested for contaminants. The MMO presumes it was due to an absence of fine material from the Particle Size	The Applicant confirms the reasoning behind the chosen quantity of intertidal contaminant samples is due to the dominance of sand and gravel and absence of fines identified within the sediment	The MMO welcomes the reasoning provided by the Applicant.

		<p>Analysis (PSA) data, however, we would like confirmation on this.</p>	<p>characterisation across the intertidal region. All of the samples reported a fine portion of 0%, as presented in Table 4.4 of 6.5.5.2 Export Cable Route and Intertidal Benthic Ecology Monitoring Report [APP-120].</p> <p>The transect “I_TR05” was proposed to ensure targeting of finer sediments as described in Section 2.2.1 of 6.5.5.2, Export Cable Route and Intertidal Benthic Ecology Monitoring Report [APP-120].</p> <p>The Applicant considers this transect within the ECC to provide a robust characterisation of baseline contaminants of the intertidal region.</p>	
MMO-RR55	OffS - Marine Water Quality	<p>Furthermore, the MMO would like confirmation from the applicant on the laboratories contracted for all analyses</p>	<p>The Applicant has provided confirmation of the contracted MMO accredited laboratories as confirmed in Section 3.6.4 of ES Volume 6.2.3, Chapter 7 Marine Water Sediment Quality [APP-072], throughout Section 3.2 of 6.5.5.2, Export Cable Route and Intertidal Benthic Ecology Monitoring Report [APP-120] and Section 3.2 of 6.5.5.1, Main Array Benthic Ecology Monitoring Report [APP-119].</p>	<p>Noted. The MMO welcome the additional information provided by the Applicant and can confirm we have no further comments on this.</p>

			<p>For further clarification the analyses undertaken and associated laboratories are as follows:</p> <p>Particle Size Distribution was undertaken by Fugro; Sediment hydrocarbons (Total hydrocarbon content (THC) and PAHs) were analysed by SOCOTEC; Sediment Metals were analysed for trace and heavy metal content by SOCOTEC; Sediment PCBs were analysed by SOCOTEC; Sediment Organotins were analysed by SOCOTEC and; Organochlorine Pesticides were analysed by SOCOTEC.</p>	
MMO-RR56	OffS - Marine Water Quality	<p>The MMO also notes that raw data for sediment quality should be provided as an annex to the Marine Water Sediment Quality chapter. Otherwise, our assessment for contaminants other than trace metals, Polycyclic Aromatic Hydrocarbons (PAHs) and PBDEs will be based on a qualitative description of the results only.</p>	<p>The Applicant's position is that quantitative data is presented within the application and assessment of all sediment contaminants can therefore be based as such.</p> <p>Section 3.1.2 of 6.2.3 Marine Water Sediment Quality [APP-072] states the relevant chapters and annexes informing the chapter. These include 6.5.5.1 Main Array Benthic Ecology Monitoring Report [APP-119] and 6.5.5.2, Export Cable Route and</p>	<p>Noted. This is currently being reviewed by the MMO.</p>

			Intertidal Benthic Ecology Monitoring Report [APP-120].	
MMO-RR57	OffS - Marine Water Quality	Given the information gaps highlighted above in the MMO's response. The MMO defers comment on necessary mitigation until the information gaps have been adequately addressed.	The Applicant has not identified any information gaps and subsequently no additional mitigation The Applicant considers the assessment to be robust, appropriate and proportionate based upon an accurate and thorough characterisation of the baseline environment.	The Applicants comments have been noted. The MMO will continue to engage with the Applicants about this.
MMO-RR58	OffS - Benthic and Intertidal	<p>The MMO notes that Volume 6, Part 2, Chapter 1: Offshore Project Description states "At this stage in the VE development process, decisions on exact locations of infrastructure and the precise technologies and construction methods employed cannot be made. Therefore, the project description at this stage is indicative and the design envelope approach (often referred to as the 'Rochdale Envelope') has been used to provide certainty that the final project as built will not exceed these parameters, whilst providing the necessary flexibility to accommodate further project refinement during the detailed design phase post-consent".</p> <p>The project description is as clearly presented as could be reasonably expected at this stage. However,</p>	<p>The Application notes that though the projects are close in proximity, the WTG and OSP sizes and water depth are notably different. These differences may result in different foundations being necessary for the Project.</p> <p>Nonetheless the Applicant is planning to remove Gravity Based Structures (GBS) from the design envelope as set out in the Notification of Intention to Submit a Change Request submitted at pre-examination Deadline D.</p>	Noted.

		<p>considering the proximity of the VE project to the Galloper OWF (and the Applicant stated benefit of using existing datasets when extending operational OWFs), the MMO queries the inclusion of gravity base jacket foundations as the engineering solution in the assessment (as worst-case scenario) rather than the pile foundations achieved at Galloper (and presented in Figure 1.3 of Volume 6, Part 2, Chapter 1 of the ES – also see Annex 1, Figure 2 below).</p>		
MMO-RR59	OffS - Benthic and Intertidal	<p>VE states that it is impossible to quantify the quantum of paint flakes released from Wind Turbine Generator (WTG) corrosion protection measures and that all paint will be confirmed as suitable for use in the marine environment. The Applicant also states, “the scale of material released will be extremely small in the context of such material that comes from general vessel traffic in the North Sea”.</p> <p>Recent research has shown that antifouling paint particles typically used in the marine environment fundamentally alter sediment microbial communities (Tagg et al. 2024) and the input of paint flakes from WTG is likely to be localised and persistent over the lifetime of the Project. Therefore, the MMO still advocates for the monitoring of a subset of WTGs to assess the</p>	<p>The Applicant maintains its position as stated during the Section 42 consultation. This is that the scale of any material i.e. paint flakes being released will be extremely small and is unlikely to show any clear trend of any impacts associated with the release of paint flakes compared to background levels.</p>	<p>Noted. This is currently under discussion, the MMO aim to provide a response by Deadline 3.</p>

		<p>prevalence/abundance of paint flakes in surrounding sediments. Although we agree that it is impossible to quantify the exact quantum of paint flakes released from any single WTG, we suggest that an assessment of surficial sediment bound paint flakes should be considered in pre- and post-construction monitoring (even if this solely involves the collection and storage/provision of samples to collaborators for this purpose) so that a robust assessment can be made of the sediment bound paint flakes before and after construction.</p>		
MMO-RR60	OffS - Benthic and Intertidal	<p>While the MMO believes the appropriate evidence base has been proposed for use in the assessment, we defer to the relevant Statutory Nature Conservation Body (SNCB) regarding the use of the Marine Life Information Network (MarLIN) MarESA in the sensitivity assessment and the classification of samples into EUNIS biotopes as they are best placed to comment with reference to these topics.</p>	Noted by the Applicant.	No further comments.
MMO-RR61	OffS - Benthic and Intertidal	<p>The appropriate data sources have been identified. Data from a site specific benthic subtidal survey campaign in November 2021 and historical data (e.g., from Galloper OWF pre- and post-</p>	Noted by the Applicant.	No further comments.

		construction surveys) have been used to characterise the area.		
MMO-RR62	OffS - Benthic and Intertidal	The MMO note that the Cefas OneBenthic dataset has also been used to demonstrate the macrofaunal assemblages across the VE array and offshore export cable corridor (ECC) in Section 5.7 of the Benthic and Intertidal Ecology Chapter of the ES.	Noted by the Applicant.	No further comments.
MMO-RR63	OffS - Benthic and Intertidal	Volume 6, Part 1, Chapter 3 of the ES includes the methodology used in the Environmental Impact Assessment and details the approach to cumulative effects. We note that the North Falls Development Consent Order (DCO) application is being applied for following the VE DCO application and that a coordinated approach to construction is being pursued in as far as is practicable.	Noted by the Applicant.	No further comments.
MMO-RR64	OffS - Benthic and Intertidal	The cumulative impact assessment for benthic ecology receptors includes a long list of projects to be considered, alongside the status (at the time of reporting) of each development, and an appropriate study area has been used in the assessment as shown in Figure 5.8 of the Benthic and Intertidal Ecology chapter (also see Annex 1, Figure 3 below).	Noted by the Applicant.	No further comments.
MMO-RR65	OffS - Benthic	While the exact location of the Project infrastructure is not yet known, Sabellaria	Noted by the Applicant.	No further comments.

	and Intertidal	spinulosa was not recorded in reef form within the offshore ECC or the WTG array area during the characterisation survey in 2021 and the Applicant has committed to micrositing to avoid adverse effects on sensitive/protected habitats, biogenic reefs, or protected species should they be encountered following analysis of the pre-construction survey data. The Applicant has confirmed that “Pre-construction surveys will be undertaken to determine the location, extent and composition of any habitats of principal importance and/or Annex I and impacts to the features will be avoided as far as reasonably practicable”.		
MMO-RR66	OffS - Benthic and Intertidal	The MMO agrees with the embedded mitigation of micro-siting infrastructure to avoid habitats of principle importance.	Noted by the Applicant.	No further comments.
MMO-RR67	OffS - Benthic and Intertidal	The Offshore Project Description chapter of the ES states that trial trenching may be undertaken up to two years prior to the commencement of the offshore construction phase. While the maximum burial depth is stated within the design envelop (3.5 m), the MMO seeks clarification from the Applicant what the minimum acceptable cable burial depth would be and if the cable will be removed	The Applicant notes that the target cable burial depth will be defined post-consent in a pre-construction Cable Burial Risk Assessment (CBRA), taking account of the ground conditions and other factors (9.12 Outline Cable Specification and Installation Plan [APP-242]).	Noted. No further comments.

		should the minimum burial depth not be achieved.		
MMO-RR68	OffS - Benthic and Intertidal	As stated in paragraph 4.2.5, the MMO defers to the relevant SNCB, regarding the cable burial hierarchy, mitigation strategy and potential use of cable protection within the Margate and Long Sands Special Area of Conservation (M & LS SAC) and any potential impacts on the protected features and conservation measures at this site.	Noted by the Applicant.	No further comments.
MMO-RR69	OffS - Fish and Shellfish	The MMO notes site-specific data collected from fisheries surveys undertaken for earlier OWF developments (e.g. Galloper, Greater Gabbard and Gunfleet Sands) have been used to provide the site characterisation. The survey data were collected between 2007 – 2014 and in our opinion are appropriate to identify the general fish assemblages typically found in the vicinity of VE. Other sources of publicly available information used to inform the assessment include MMO fisheries reports, spawning and nursery ground data (Coull et al. 1998 and Ellis et al. 2012), International Herring Larval Survey (IHLS) data, ICES beam trawl and bottom trawl data, and seabed sediment data from the British Geological Survey (BGS) and EUSEa Map. Collectively, the MMO considers that the evidence used to	This is welcomed by the Applicant.	No further comments.

		inform the fisheries and fish ecology assessment is appropriate.		
MMO-RR70	OffS - Fish and Shellfish	We, however, believe there may be some inaccuracies with the IHLS data used to inform the assessment as there appear to be some data missing. Please see paragraphs 4.3.19, 4.3.20, 4.3.22 and 4.3.23 for further details.	The Applicant directs the MMO to the Applicant's responses to references MMO-RR85, MMO-RR86, MMO-RR88 and MMO-RR89.	Noted. This is currently being reviewed by the MMO.
MMO-RR71	OffS - Fish and Shellfish	The potential impacts arising from the construction and operation of VE have been identified in Table 6.10 of the Fish and Shellfish Ecology ES Chapter. The impacts and effects identified are appropriate and that the evidence used to inform the ES is generally consistent with that submitted for operations of a similar nature.	This is welcomed by the Applicant.	No further comments.
MMO-RR72	OffS - Fish and Shellfish	The MMO still have some concerns related to the appropriateness of the mitigation measures presented by the Applicant (see paragraphs 4.3.15 – 4.3.16 and 4.3.26). This includes the methodology used to calculate 'peak' spawning, and thus the duration of the temporal restriction (see paragraphs 4.3.19 – 4.3.23).	The Applicant held a meeting with the MMO's advisors Cefas on the 8th August 2024, where these concerns were discussed in more detail. With regards the MMOs concerns relating to the appropriateness of the mitigation measures presented, the Applicant directs the MMO to the Applicant's responses to references MMO-RR83, MMO-RR84 and MMO-RR91. Regarding the MMO concerns regarding the methodology	Noted. This is currently being reviewed by the MMO.

			used to determine the peak herring spawning period, the Applicant directs the MMO to the Applicant's responses to references MMO-RR85 to MMO-RR89.	
MMO-RR73	OffS - Fish and Shellfish	VE has now carried out habitat suitability assessments following the MarineSpace et al. (2013a and 2013b) methods for herring and sandeel respectively. These are presented as Figure 3.9 for herring and Figure 3.15 for sandeel in the Fish and Shellfish Ecology Technical Baseline Report. The Applicant acknowledges that the array overlaps areas of 'high' potential herring spawning habitat and 'high' sandeel habitat suitability, as shown in the heatmaps presented. This is especially true for the southern array for herring, with the northern array and much of the cable corridor overlapping less suitable herring spawning habitat. For sandeel, both the northern and southern array overlap 'high' suitability habitat, along with some of the cable corridor.	This is noted by the Applicant.	No further comments.
MMO-RR74	OffS - Fish and Shellfish	The Applicant does highlight that there is poor correlation between site-specific Particle Size Analysis (PSA) data and the British Geological Survey (BGS) data in some areas. In addition to the large areas of suitable sandeel habitat in the vicinity of the array area (AA) and export cable corridor (ECC) which could call in to	As informed by the heatmapping exercise (detailed in 6.5.6.1: Fish and Shellfish Ecology Technical Baseline Report [APP-121]), the outputs of which are presented in Figures 3.15 of 6.5.6.1: Fish and Shellfish Ecology Technical Baseline Report [APP-121] and	The MMO welcome the additional information provided and is currently reviewing this with the aim of providing a response for Deadline 3.

question the importance of this habitat to sandeel at a regional scale. It should be noted that although there may be suitable habitat in the broader area, it may not be evenly distributed due to a number of biological and environmental factors, and therefore the EEC and AA may still represent an area of importance for sandeel. The Applicant should also note that the MarineSpace et al. (2013a and 2013b) methods have recently been revised to improve the seabed sediment data coverage used in the methods, see Kyle-Henney et al., 2023 (for herring) and Reach et al., 2023 (for sandeel). These represent the best available methods for assessing habitat suitability for herring and sandeel, however we recognise that these would not have been available at the time the VE ES was written.

Figure 6.9 of 6.2.5 Fish and Shellfish Ecology [APP-075]) undertaken in accordance with the MarineSpace (2013) methodology, the array areas were identified as having medium to high confidence that the seabed may be suitable for spawning, and the ECC as having low to medium confidence that the seabed may be suitable for spawning, with a discrete area of high confidence in the mid-section of the ECC. The Applicant, notes that as detailed in paragraph 6.11.248 of Volume 6, Part 2, Chapter 5: Fish and Shellfish Ecology, and paragraph 3.1.59 of Volume 6, Part 5, Annex 6.1: Fish and Shellfish Ecology Technical Baseline Report, sandeel spawning grounds are located across the southern North Sea (Coull et al., 1998), with potential sandeel habitats also present across the eastern English Channel and Dover Strait. This is supported by the heatmapping exercise, which classified the southern North Sea, and eastern English Channel and areas within the Dover Strait as having medium to high confidence that the seabed may be suitable for spawning.

			<p>The Applicant therefore maintains that, taking into consideration the broadscale nature of sandeel habitats, across the southern North Sea and English Channel, that the Five Estuaries array areas and ECC are</p> <p>not considered areas of key importance for sandeel inhabitation, or spawning activity.</p> <p>The Applicant also, reaffirms, that as raised by the MMO, the methodologies as detailed in Kyle-Henney et al., (2023) and Reach et al., (2023) were not available at the time of writing. Therefore, the heatmapping exercise was undertaken in accordance with the best available information and methodologies at the time.</p>	
MMO-RR75	OffS - Fish and Shellfish	<p>The MMO notes that the underwater noise assessment carried out by the Applicant now includes a section assessing the impacts of underwater noise (UWN) generated by the detonation of UXO. In addition, the Applicant has now included the requested UWN modelling using the 135 dB SELss threshold (as per Hawkins et al. 2014) to predict the impact range for behavioural effects in herring (see Figures 6.22 and 6.23 in the chapter Fish and Shellfish Ecology). The Applicant's use of this</p>	<p>Regarding the presentation of the 135 dB SELss threshold (as per Hawkins et al. 2014) (the use of which the Applicant does not support), the Applicant directs the MMO to the Applicant's response to reference MMO-RR77 below.</p> <p>With regard to the MMOs concerns about the proposed mitigation measures, the Applicant directs the MMO to the Applicants responses to</p>	<p>Noted. This is currently being reviewed by the MMO.</p>

		<p>threshold is an appropriate approach however please see paragraph 4.3.9. The plume modelling provided also seems broadly appropriate and shows that the impacts of elevated Suspended Sediment Concentration (SSC) and the potential smothering effects will likely extend up to a maximum of 500m. The SSC will decrease with distance from the source and will last for the duration of the disturbance plus a maximum of one tidal cycle. VE is now in agreement that the impacts of UWN due to piling and elevated SSC due to cable installation works and bed preparation have the potential to impact spawning herring due to the proximity of suitable herring spawning habitat (see paragraphs 4.3.15-4.3.16). These impacts have been assessed as not significant with the appropriate mitigation; and whilst the MMO agrees with this statement, we do not have sufficient confidence in the mitigation measures that the Applicant has presented at this stage (see paragraphs 4.3.19-4.3.23 and 4.3.26 for further comments).</p>	<p>references MMO-RR85 to MMO-RR89, and MMO-RR91 below.</p>	
MMO-RR76	OffS - Fish and Shellfish	<p>It would have aided the assessment if the Applicant had overlaid the UWN modelled noise contours over the herring potential spawning habitat heatmap provided in Figure 3.9 of the Fish and Shellfish</p>	<p>The Applicant confirms that these outputs will be provided at Deadline 1.</p>	<p>Noted. The MMO will review these once available for review.</p>

		Ecology Technical Baseline Report, rather than overlay the noise contours over IHLS data and Coull et al. (1998) data. This would have provided a more robust demonstration of where noise contours overlap areas of suitable spawning habitat, as opposed to just showing noise overlap with those areas where larvae are caught.		
MMO-RR77	OffS - Fish and Shellfish	VE considers the 135 dB behavioural impact threshold for herring (based on Hawkins et al. (2014) to be too precautionary due to the environment in which the study was undertaken (a quiet lough). The Applicant suggests that the environment is not comparable to the study area where fish receptors are likely acclimated to higher background UWN. Whilst the MMO agrees with the Applicant that there are environmental differences between Hawkins et al. (2014) and the present study area, it should be noted that the use of the 135 dB threshold constitutes the best available evidence in lieu of an appropriate alternative. The use of the 135 dB threshold is considered best practice by Cefas and its use in UWN modelling is consistent with other projects of a similar nature. We note that the Applicant has presented the 135 dB threshold noise contour in Figures 6.22 and 6.23 of the ES chapter Fish and	The Applicant confirms that the underwater noise contours, as defined using the 135dB SELss threshold (based on a study by Hawkins et al., (2014)) have been presented as 5dB increments in Figures 6.22 and 6.23 in 6.2.5 Fish and Shellfish Ecology [APP-075]. The presentation of these contours as 5 dB increments has been undertaken to reflect the range of potential behavioural responses to underwater noise stimuli, and the influence of factors such as the type of fish/shellfish, sex, age and condition, as well as other stressors to which the fish/shellfish have been exposed. The presentation of these contours has been further supported by a literature review in paragraph 6.11.180 <i>et seq.</i> of 6.2.5 Fish and Shellfish Ecology [APP-075]. The Applicant would also like to	The MMO welcome the clarification and justification provided. This is currently under review by the MMO

Shellfish Ecology, these figures would be much clearer if only the relevant noise contours were presented (186 dB, 203 dB, 207 dB, 210 dB (SELcum) as per Popper et al. 2014) and 135 dB SELss, as per Hawkins et al. 2014), rather than showing contours at 5dB intervals, most of which are not relevant to the assessment and results in overcrowded figures that are difficult to interpret.

highlight, that the 135dB SELss threshold (Hawkins et al., 2014), has been presented separately to the injurious and temporary threshold shifts (TTS) (Popper et al., 2014) due to the different noise metrics being presented. The Applicant does not consider it appropriate to present these metrics together in the same figures. Furthermore, the Applicant, maintains their position, that they do not support the application of the 135 dB SEL contour to establish behavioural impact ranges for sensitive receptors. The use of this threshold for noise impact assessments is expressly advised against by the authors of the paper. Specifically, this threshold is based on a study undertaken within a quiet loch on fish not involved in any particular activity (i.e. not spawning), and it is therefore not considered appropriate to use this threshold within a much noisier area such as the English Channel (which is subject to high levels of anthropogenic activity and consequently noise) as the fish within this area will be acclimated to the noise and would be expected to

			have a correspondingly lower sensitivity to noise levels	
MMO-RR78	OffS - Fish and Shellfish	<p>The Applicant has presented a brief assessment of UXO clearance as part of the UWN assessment, it should be noted that UXO clearance will be consented under a separate Marine Licence (post-consent) and therefore not under the DCO. Please also note that two marine licences may be required: one for determining the number of UXOs and a second for the clearance of the UXOs found. Based on the information provided at this stage, it is anticipated that there will be up to 2000 UXO targets with up to 60 requiring clearance in the pre-construction phase. Clearances will occur either by high-order or low-order (deflagration) methods and will be limited to two in a 24-hour period. The maximum expected UXO weight is 698 kg a 0.5kg donor charge will be used of both low and high order clearance. The preliminary results show that mortality and potential mortal injury will likely occur up to 890 metres away from the source given the worst-case scenario. VE has identified potential suitable mitigation measures</p>	<p>The Applicant confirms that, as noted by the MMO, the potential for impacts on fish and shellfish receptors from UXO clearance are detailed in paragraph 6.11.221 et seq. of 6.2.5 Fish and Shellfish Ecology [APP-075], however the UXO clearance will be consented under a separate Marine Licence (post DCO-consent).</p> <p>The Applicant confirms that, as detailed paragraph 4.1.1 et seq. of 9.14.2, Marine Mammal Mitigation Protocol – UXO [APP-245], the Applicant has highlighted a suite of mitigation measures that the Applicant could implement for VE UXO clearance. However, the Applicant reasserts that, as stated in paragraph 4.1.2, the UXO clearance mitigation measures for VE will be determined in consultation with relevant SNCBs once charge weights, survey data, noise data, and information on maturation of emerging technologies are</p>	Noted.

		<p>such as micro siting, preference for low order clearance and use of bubble-curtains as noise abatement measures. Given the proximity of suitable herring spawning habitat to the AA and ECC, the MMO note that suitable mitigation and/or noise abatement measures should be further explored.</p>	<p>confirmed. The additional data and information will inform noise modelling to be fed into the Final UXO Clearance Marine Mammal Mitigation Protocol (MMMP).</p> <p>The Applicant acknowledges that two marine licences may be required: one for determining the number of UXOs and a second for the clearance of the UXOs found.</p>	
MMO-RR79	OffS - Fish and Shellfish	<p>The Applicant states that cables will be buried below the seabed wherever possible, with a target burial depth to be defined post-consent, using a Cable Burial Risk Assessment (CBRA) to take account of the ground conditions and other factors. In line the with the National Policy Statement EN3 (Department of Energy & Climate Change, 2011), the MMO recommends that, where possible, cables are buried to a minimum depth of 1.5m (subject to local geology or seabed obstructions). Burying cables to the minimum depth will reduce the risk of snagging and damage to cables by other marine vessels e.g. anchors, bottom-towed gear. It will also increase the distance between electro-sensitive fish receptors and electro-magnetic fields (EMF).</p>	<p>This is noted by the Applicant. The Applicant reiterates that a target burial depth will be informed by post-consent 9.9 Outline Cable Burial Risk Assessment [APP-239], and the CSIP (in accordance with the Outline Cable Specification and Installation Plan [APP-242]) which will also identify what (if any) cable protection is required to address both technical and ecological requirements. As noted by the MMO it is in the Applicant's interest to ensure, as far as reasonably possible, that cables are either sufficiently buried or otherwise protected to reduce risk of snagging or damage.</p>	Noted.

MMO-RR80	OffS - Fish and Shellfish	<p>The MMO raised concerns in our Section 42 response regarding quantifying the impacts to spawning grounds and habitat as a percentage of area affected. For ease this information has been provided again below:</p> <p>The MMO do not support the calculation of total spawning habitat, as this approach can over, or underrepresent spawning grounds and is solely based on substrate suitability. The MMO have provided a summary of the reasons below why we do not support the calculation of total spawning habitat:</p> <p>(i) Spawning areas can change over time or become recolonised.</p> <p>(ii) Whilst spawning and nursery ground maps are used to provide the most recent and appropriate information to identify spawning areas, they do not fully define/consider/identify the following:</p> <p>All potential areas of spawning, Any habituation that may occur i.e., identify areas where higher densities of spawning are present, Specific substrate requirements e.g., substrates which are most suitable within the wider broadscale sediments, More suitable topography e.g., ridges/edges of sandbanks where</p>	<p>The Applicant agrees with the points raised by the MMO with regards to the interchangeable nature of spawning and nursery ground extents. The spawning and nursery grounds and spawning seasons are defined by Ellis et al., (2012) and Coull et al., (1998). The extents of the grounds and the durations of spawning periods are considered highly precautionary, on the basis that Coull et al., (1998) specifically states that the spawning and nursery grounds should be seen as representing the widest known distribution given current knowledge and should not be seen as rigid. This is also the case with the duration of spawning seasons, with the seasons tabulated in Coull et al., (1998) described as the generally accepted maximum duration of spawning.</p> <p>Furthermore, the Applicant would like to highlight that the EIA, in line with PINS Advice Note Nine: Rochdale Envelope (PINS, 2018a), is based on identifying the Maximum Design Scenario (MDS) for each impact assessed. This approach ensures that the scenario that would result in the greatest impact (e.g.,</p>	<p>The MMO welcome the additional information provided with regards to the concerns raised. We are currently reviewing the additional information provided and will provide a response for Deadline 3</p>
----------	---------------------------------	--	--	---

sandeel may spawn or furrows where herring may spawn,
Environmental factors that may influence spawning intensity such as temperature, oxygenation, natural disturbance, anthropogenic disturbance etc.,
Calculations of specific spawning areas are based on peak spawning times i.e., the number of days of a spawning period rather than considering the entire spawning season.

largest footprint, longest exposure, or largest dimensions) is considered. The MDS for fish and shellfish receptors is provided in Table 6.10 of 6.2.5 Fish and Shellfish Ecology [APP-075] and provides parameters which are judged to give rise to the maximum levels of effect for the assessment undertaken, as set out in 6.2.1 Offshore Project Description [APP-069]. As such, the habitat disturbance percentages as presented in 6.2.5 Fish and Shellfish Ecology [APP-075] are derived from a worst-case scenario and is considered inherently precautionary.

In addition, the Applicant highlights, that when considering the temporal MDS, relative to spawning periods, an assumption is made that entirety of the proposed works (for example piling activities) will occur within the spawning periods, and therefore the actual temporal impact on the receptors will be considerably less.

Lastly, the Applicant would like to highlight that the quantification of impacts, to contextualise the assessment, is a standard approach that is adopted by a multitude of offshore wind farm applications

			<p>(Hornsea Four OWF (Orsted, 2021); Rampion 2 OWF (RED, 2023); Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects (Equinor, 2022)).</p> <p>Therefore, the Applicant considers that quantifying the percentage overlap of spawning grounds and the percentage temporal interaction with spawning periods is suitably precautionary for the assessment presented in 6.2.5 Fish and Shellfish Ecology [APP-075].</p>	
MMO-RR81	OffS - Fish and Shellfish	<p>The MMO notes that VE has attempted to justify the use of percentages to quantify the amount of habitat and the amount (duration) of the spawning season impacted. These have been used throughout the ES chapter Fish and Shellfish Ecology despite concerns raised in the Section 42 response. The Applicant argues “that the spawning grounds and the duration of spawning periods are considered highly precautionary; this is on the basis that Coull et al., (1998) specifically states that the spawning and nursery grounds should be seen as representing the widest known distribution given current knowledge and should not be seen as rigid. This is also the case with the duration of spawning seasons, with the seasons tabulated in</p>	<p>The Applicant directs the MMO to the Applicant’s response to MMO-RR80 above. The Applicant confirms that the raw figures (and their appropriate units) are also provided in Table 6.10 of Fish and Shellfish Ecology [APP-075].</p>	As above.

		<p>Coull et al., (1998) described as the generally accepted maximum duration of spawning.” The MMO disagrees with these statements, and for the reasons stated in the paragraph 4.3.12. The high uncertainty associated with exact quantification of these areas/periods as a percentage is not an appropriate approach. We recommend the Applicant presents these as raw figures in appropriate units such as m2 or days-1.</p>		
MMO-RR82	OffS - Fish and Shellfish	<p>The MMO notes that the Applicant has cited Geffen (1986) in the Herring Seasonal Restriction Note, but this study is not included in the reference list.</p>	<p>This is noted by the Applicant and the reference will be provided in an updated Herring Seasonal Restriction Note, which the Applicant will aim to provide at Deadline 1.</p>	<p>Noted. The MMO will review this once available.</p>
MMO-RR83	OffS - Fish and Shellfish	<p>The Applicant has proposed the following mitigation measures in addition to those presented at the PEIR stage:</p> <ul style="list-style-type: none"> i. To avoid population impacts to Downs herring from UWN during their spawning season, no piling will be undertaken within the array areas during the ‘peak’ Downs herring spawning period, defined by the Applicant as 6th November until 1st January. ii. To avoid population impacts to Downs herring spawning habitat and herring eggs and larvae from increased SSC due to cable installation and bed preparation 	<p>The Applicant directs the MMO to the Applicant’s responses to references MMO-RR85 to MMO-RR90, and MMO-RR91.</p>	<p>Noted. This is currently being reviewed by the MMO.</p>

		<p>works, dredged material from the northern array area will not be disposed of within the southern array area, to ensure sediment characteristics of the southern array area are maintained.</p> <p>The MMO considers these mitigation measures (paragraphs 4.3.15 i and ii) are not appropriate in their current form, please see below for further details.</p>		
MMO-RR84	OffS - Fish and Shellfish	<p>To inform measure 4.3.15 i and identify a suitable temporal piling restriction, VE has carried out a back-calculation method to identify the 'peak' spawning period for the Downs herring stock. The data have been used to calculate the start and end of the 'peak' spawning period based on the earliest/latest survey start date, less the number of days from hatch length to catch length, less the yolk absorption and egg development periods. This involves the use of IHLS data for 2007-2022 and the following parameters:</p> <ul style="list-style-type: none"> i. IHLS survey timings and bottom sea temperature data. ii. Larval length in survey sample data. iii. Laval length at hatching. iv. Egg development period. v. Yolk absorption period. 	This is welcomed by the Applicant.	No further comments.

		<p>vi. Growth rate.</p> <p>The Applicant has used a larval length of 11 millimetres (mm) on which to base the calculation of a conservative estimate of the start and end of peak spawning as most of the larvae within the survey will have been spawned later than the calculated start date as 89.9% of all larvae recorded were ≤ 11 mm. The length at hatch has been estimated at 5 mm this is considered to be a conservative estimate however this size is occasionally reported for the Downs stock (0.5% of the recorded larvae). The justification for, and the choice of 11mm length at catch and 5mm length at hatch is appropriate.</p>		
MMO-RR85	OffS - Fish and Shellfish	<p>The egg development period used in the calculation is based on Russell (1976). Data for the temperature at the maximum sampling depth for each trawl is recorded as part of the IHLS data (2007- 2022) and these temperature data have been used to determine the average temperature at the maximum sampling depth. This represents the average seafloor temperature for the egg development period. A temperature of 8.5°C has been used as a conservative temperature, which is the average temperature of the IHLS dataset covering the (coolest) northeastern extent of the English Channel. This is 1.4°C cooler than the</p>	<p>The Applicant acknowledges that the note makes references to the English Channel and not the Southern North Sea. This will be amended in the Deadline 1 Submission.</p> <p>The Applicant confirms that the mean seafloor temperature used to inform the back calculation (8.5°C) was based on all the sample temperatures recorded within the full 15-year dataset across the extent of the Southern North Sea (noting that temperatures in the Southern North Sea were 1.4°C cooler than the</p>	<p>The MMO welcome the additional information provided by the Applicant. The MMO will provide further comments at Deadline 3.</p>

average temperature for the entire English Channel. Based on this, a 14-day egg development duration has been used to inform the start date. The egg development duration calculation based on Russell (1976) is appropriate, however it is not clear at this stage whether 8.5°C is an appropriate temperature for the calculation. VE compares the temperature chosen with the average for the English Channel, stating that it is 1.4°C cooler. It should be noted that the project is not located in the English Channel but the Southern North Sea. Therefore, comparing temperatures with the English Channel is not appropriate. Furthermore, it is not clear if the temperature used by the Applicant to inform the back-calculation is appropriate. The Applicant has chosen the average temperature, however this cannot be considered a precautionary approach, as the temperature in the IHLS data ranged from 6.3°C to 10.1°C. The minimum temperature values should be used in the calculation to ensure that there is no scope for underestimating the time from peak spawning; and therefore, potentially allowing piling works to occur during this sensitive period.

average temperature for the English Channel).

The Applicant appreciates that while temperatures lower than 8.5°C were identified in the Southern North Sea, these temperatures are evident outside of any larval hotspots (see Figure 2.2 of 6.5.6.4 Herring Seasonal Restriction Note [APP-125]). The Applicant also notes, that as evident in Figures 6.1 to 6.11, herring larval hotspots are generally associated with areas of warmer water, with the lowest temperature recorded in the hotspots in any year being 10 °C.

The Applicant notes that the MMO proposes the use of the minimum temperature values to inform the back calculations. The Applicant would like to highlight, that the Russell et al. (1976) paper does not provide values for yolk absorption and egg development at such a resolution to enable the use of a 6.3°C value, the 8.5°C temperature remains the most appropriate value to use.

Specifically, this value can still be considered a precautionary temperature to determine the

			<p>durations for egg development and yolk absorption as in all other years the temperature within areas of peak herring larval densities (i.e. the region of greatest importance) was above this value and so the durations would be faster than those used within the calculations.</p> <p>As such, the Applicant considers that to use a lower temperature than the already conservative 8.5°C, particularly as low as 6.3°C proposed by the MMO, would be excessively conservative as to be meaningless when considering the temperature values associated with the hotspot (i.e. the primary area of spawning).</p>	
MMO-RR86	OffS - Fish and Shellfish	<p>The Applicant has presented data showing the average temperature at the maximum sampling depth for each IHLS sampling station for the years 2007 – 2022 in Figure 2.2 in the document Herring Seasonal Restriction Note. The temperatures at the maximum depth for each sampling station for each of these years has then been presented in Figures 6.1 - 6.14 (in Appendix B of the Herring Seasonal Restriction Note). However, the legend for Figures 6.1 - 6.14 states that the data show 'Average Temperature (degrees)', rather than the site and year</p>	<p>The Applicant confirms that the temperatures presented in Figures 6.1 - 6.14 show the temperatures recorded at the maximum sampling depth at each sampling station. The Applicant also confirms that the hauls and their associated temperatures within the vicinity of an allocated station ID (a grid of master station locations was created, as stations are not assigned to each year of data) are averaged at each allocated point based on the surveyed samples that were present</p>	<p>Noted. The MMO welcome the clarification and aim to provide further comments for Deadline 3.</p>

		<p>specific bottom temperature for that particular year. The MMO asks for VE to clarify if these are average values or single values for each year.</p>	<p>that year. Figure 2.2 of Herring Seasonal Restriction Note, shows the mean temperatures recorded at the maximum sampling depths, from 2007-2022.</p>	
MMO-RR87	OffS - Fish and Shellfish	<p>The yolk absorption duration and the growth rate chosen for the back calculation are also not appropriate. Kiorboe et al., (1985) and Geffen (2002) have been used to inform the yolk absorption period and Oeberst et al. (2009) has been used to inform the growth rate. It should be noted that these studies use herring from the west coast of Scotland (the Clyde stock), Baltic and Limfjord, Denmark (the Dogger stock). None of these herring stocks exhibit the same spawning period as the Downs stock (November – January). A comparison of growth rates between stocks which have different spawning characteristics and are therefore physiologically different is not appropriate. VE should use the yolk absorption periods from Russell (1976) (see Table 2 below), and the growth rates from Heath (1993) which focus on the Downs stock and are therefore appropriate sources.</p>	<p>The Applicant notes the MMO's request to adopt a slower growth rate in line with that proposed by Heath (1993). The Applicant however is confident that the equation presented by Oeberst et al. (2008) to calculate growth rates is appropriate to estimate the growth rate for the Downs herring stock. The growth rate presented by Heath (1993) is based on herring stocks distributed across the northeast Atlantic, which would equate for significant variations in temperature, with the temperatures within the more northerly stocks much lower than those within the Downs stock region. The calculation as presented in Heath (1993) does not account for temperature as a variable, whilst it is widely accepted that sea temperature affects herring larvae growth rates (Stevenson 1962; Keegen et al. 1986; McGurk 1984; Ottersen and Loeng 2000). On this basis, that the Applicant does not</p>	<p>The MMO welcome the additional information provided by the Applicant. The MMO will provide further comments at Deadline 3.</p>

Table 1 Egg development periods

Average temperature	Days
12 - 13° C	7-9
10 - 11° C	10-12
7 - 8° C	14-18
3 -4° C	49

From Russell 1976.

Table 2 Yolk absorption periods

Average temperature	Days
12.8° C	3 & 9
12.0° C	5 & 14
10.7° C	7 & 16
10.3° C	7 & 20

consider Heath (1993) to be a reliable source for the determination of growth rates. The Applicant is therefore confident that the calculation presented in Oeberst et al. (2008), which accounts for temperature as a variable, is appropriate to determine the growth rate of the Downs stock herring.

The Applicant also notes the MMOs request to adopt the yolk absorption periods from Russell (1976). The Applicant confirms that the yolk absorption durations adopted by Kiorboe et al., (1985) and Geffen (2002) have been deemed most appropriate, due to the temperatures recorded within the studies. The average temperatures for yolk absorption periods recorded by Russell (1976) ranged from 10.3°C to 12.8°C, which are not comparable to the bottom temperatures of the southern North Sea (in the IHLS data). The Applicant therefore deemed the yolk absorption durations from Kiorboe et al., (1985) and Geffen (2002) are more suitable, as they are based on herring larvae reared at temperatures of 7°C and 8 °C respectively.

MMO-RR88	OffS - Fish and Shellfish	<p>The IHLS data used to inform the back-calculations also appears to be incomplete. VE states that IHLS data from 2007-2022 have been used to inform the calculations, some limitations in the data have been acknowledged such as the lack of any surveys of the Downs stock in 2018 and the lack of a December survey in 2014. However there appears to be some additional dates and even surveys missing from Table 2.1 of the Underwater Noise Report which shows the survey years and the start and end dates of the IHLS data for each year. A quick cross reference with the IHLS data from ICES data portal (see https://www.ices.dk/data/data-portals/Pages/Eggs-and-larvae.aspx) shows that the data presented in the table do not match. For example, from 2019 - 2022 the table appears to show that no January surveys took place, however ICES reports that in 2021 there was a survey from January 6th- 9th and in 2022 there was a survey from January 8th - 11th. In addition, there appear to be inconsistencies between the start and end dates of surveys shown in Table 2.1 compared to the data on the ICES portal, for example for 2019, Table 2.1 states that the survey occurred from December 18th – 19th, when ICES reports the dates as December 16th – 20th. This is not an</p>	<p>The Applicant confirms that a revised Herring Seasonal Restriction Note will be provided at Deadline 1, with the latest IHLS data incorporated.</p>	<p>The MMO will continue to engage with the Applicant over this issue but welcome the confirmation that a revised Herring Seasonal Restriction Note will be provided. The MMO will review this once available.</p>
----------	---------------------------------	--	--	--

		<p>exhaustive list and a number of other similar inconsistencies were also identified, the Applicant should revisit the ICES portal and obtain the correct and complete IHLS data set for the Q12 and Q1 surveys. It should be noted that until 2018, the Southern North Sea and eastern English Channel (SNS) Downs IHLS surveys were conducted as three separate sampling events; one in the 3rd quarter of each year undertaken by the Netherlands between 16th - 31st December, and two in the 1st quarter of each year; between 1st - 15th January undertaken by Germany, and between 16th – 31st January undertaken by the Netherlands. From 2018 onwards, the latter survey (between 16th – 31st January) was discontinued, however, the spatial coverage for all surveys remains the same and it is only the temporal coverage which has changed.</p>		
MMO-RR89	OffS - Fish and Shellfish	<p>In the MMO’s response at the PEIR stage we mentioned that herring spawning typically occurs later in the season in the area of the Downs spawning ground where VE is located, compared to the areas of spawning ground in the English Channel. With this in mind, our suggestion that a ‘peak’ of spawning activity could potentially be established, was on the basis of breaking down the</p>	<p>A meeting was also held with the MMO’s advisors, Cefas on the 8th August 2024, where this was detailed further.</p> <p>The Applicant confirms that a revised Herring Seasonal Restriction Note will be provided at Deadline 1, with consideration of the larval</p>	As above for comment MMO-RR88

		<p>IHLS survey data by each of the three survey periods (two survey periods for 2018 onwards), this would allow for better interrogation of the data to identify when larval abundances were at their highest in the Southern North Sea spawning ground. This important step needs to be considered in order to better explore the refinement of the spawning restriction. The MMO are content to arrange a meeting between the Applicant, the MMO and our technical advisers Cefas to discuss this matter, prior to the Applicant carrying out further back calculations.</p>	<p>densities recorded within the individual surveys.</p>	
MMO-RR90	OffS - Fish and Shellfish	<p>The MMO would like to highlight that once a peak spawning period has been agreed, a suitable buffer period should also be implemented to allow for settlement of seabed habitats and allow migration of herring to their spawning grounds. This buffer period has been set at eight days for other projects of a similar nature.</p>	<p>The Applicant confirms that multiple measures of conservatism are already incorporated into the definition of a peak spawning period for down stock herring. These include:</p> <p>The consideration of a four hatch sizes, from 5mm (the most conservative hatch size to determine the start date) to 11mm (the most conservative hatch size to determine the end date) as informed IHLS survey data;</p> <p>The inclusion of a 14 day egg development duration, a 7 day yolk absorption period and slower growth rate (0.34 mm d-1);</p>	<p>The Applicants comments have been noted and the additional information provided is being reviewed by the MMO.</p>

			<p>The use of the earliest survey start date and latest survey end dates across all four hatch sizes as a precautionary measure, extending the seasonal restriction period from 38 days to 56 days.</p> <p>VE lies within the migration pathway for herring, however, is positioned on the northeastern return leg of the herring migration pathway. Therefore, it is not considered that piling would have any impacts on herring migration to the spawning grounds. Notwithstanding this, the Applicant is confident that that it has implemented a sufficiently precautionary approach in defining the Downs stock herring spawning period to accommodate the migration of herring from the spawning grounds.</p>	
MMO-RR91	OffS - Fish and Shellfish	<p>Sediment Disposal Restriction</p> <p>As far as the MMO can tell, the mitigation measure proposed by the applicant, 4.3.15 ii, has been informed by the sediment suitability maps for herring (and sandeel) and is aimed at maintaining the sediment characteristics in each array and therefore their potential suitability to herring (and sandeel). Although we agree that sediment collected during cable</p>	<p>The Applicant assumes that the MMO are recommending a temporal restriction to restrict dredging and disposal of material from the southern array area and not the northern array area.</p> <p>As informed by the IHLS surveys, areas of high densities of herring eggs and larvae for the Downs herring stock occur consistently in</p>	<p>The MMO welcomes the additional information provided by the Applicant. This will be reviewed by the MMO and a response provided by Deadline 3.</p>

installation and bed preparation works should be returned to broadly the same location from where it originated this mitigation measure is not sufficient in isolation to reduce other impacts to herring associated with increased SSC such as potential smothering of eggs and larvae.

The sediment disposal restriction does not provide adequate protection to spawning herring and resultant eggs and larvae. Herring are benthic spawners attaching their demersal eggs to coarse sediments such as gravel and sandy gravels. Cable burial and bed preparation is estimated to disturb approximately 42 million cubic metres (m³) of sediment over the whole construction period. If these activities are to be carried out during the herring spawning season there is a potential for smothering of herring eggs due to the resulting sediment deposition. Given that the southern array overlaps areas of 'high' herring spawning potential (Figure 3.9 of chapter Fish and Shellfish Ecology Technical Baseline Report) and that the impacts of elevated SSC may extend up to 500m from the source, there may be potential for significant impacts to herring spawning success at a population level. Therefore, a temporal restriction on bed preparation

the English Channel. The presence of eggs and larvae within the array areas and across the wider southern North Sea are comparatively much lower.

Considering the overlap of the southern array area with a historic spawning ground (as defined by Coull et al., 1998) and the presence of suitable spawning substrates for herring, the Applicant has therefore taken a precautionary approach to ensure herring spawning habitat characteristics are maintained in the southern array area. The Applicant therefore maintains that further mitigation to minimise the potential for impacts to herring eggs and larvae in the southern array area is not necessary, due to the significantly lower densities of herring eggs and larvae present in the area.

		<p>and cable laying works in the southern array area will be necessary. It should be noted that the cable corridor and northern array overlap areas of lower herring spawning potential and therefore are of less concern. The MMO recommends that a temporal restriction is conditioned on the deemed marine licence (DML) to restrict dredging and disposal of material from the northern array area during the Downs herring spawning season in order to minimise the potential for impacts to herring eggs and larvae from activities likely to generate high SSC.</p>		
MMO-RR92	OffS - Fish and Shellfish	<p>Whilst the MMO agrees with some of the results of the cumulative assessment, we do not support the Applicant's conclusions of no significant cumulative effects for the impacts of UWN and elevated SSC. The mitigation measures that the Applicant has currently presented to reduce impacts to herring from these two sources are not appropriate in their current form, please see paragraphs 4.3.15-4.3.16, 4.3.19-4.3.23 and 4.3.26 for details.</p>	<p>The Applicant maintains that with the implementation of the proposed mitigation measures, which include a seasonal piling ban to mitigate against impacts to spawning herring from underwater noise, and a sediment disposal restriction to mitigate against impacts to spawning herring from smothering effects from sediment, there will be</p>	<p>The MMO notes the Applicants position and additional justification. This is currently being reviewed by the MMO and we will aim to provide further comments by Deadline 3.</p>

MMO-RR93	OffS - Fish and Shellfish	<p>In the Fish and Shellfish Ecology Technical Baseline, VE states the following; ‘until recently, fish were assumed to flee the noise stimulus at a rate of 1.5 m/s, however recent projects (RWE, 2022; Equinor, 2022; Ørsted, 2021; Vattenfall, 2019) have been advised to also consider stationary receptor modelling for some species groups’. Please note that the MMO’s position on the use of a fleeing receptor has not changed and is as follows: The MMO do not support the use of a fleeing fish receptor when modelling the range of effect for UWN because there is no empirical evidence that fish will flee from a source of disturbance. The ‘generic’ fish swimming speed of 1.5m/s is based on Hirata K (1999). However, this does not comprise empirical evidence that fish will flee from the source of noise, and its use in this way may be considered speculative. It should also be recognised that swimming speeds are not the same as fleeing speeds. In studies which have sought to quantify swimming speed in fish, swimming performance is categorised into sustained, burst and prolonged swimming (Beamish, 1978; Cano-Barbacil et al., 2020), which are defined in the literature as follows:</p>	<p>The Applicant considers that the fleeing receptor approach is relevant where mobile species are not spatially restricted (due to breeding activity for example). Where species are restricted in such ways, the assessment has been undertaken using the static receptor modelling outputs. The Applicant confirms that spawning herring, sandeel, and seahorses have all been assessed as stationary receptors when regarding impacts from underwater noise.</p> <p>The Applicant would also note however that the assumption that fish would remain exposed to noise for the entire duration of piling with no response reaction represents a highly precautionary position.</p>	
----------	---------------------------------	---	---	--

		<p>i. Sustained swimming is aerobically generated and can be maintained for periods of time without muscular fatigue (excess of 200 minutes).</p> <p>ii. Burst swimming is the maximum achievable swimming speed, this type of swimming is anaerobically generated and can only be sustained over short periods (20-30 seconds).</p> <p>iii. Prolonged swimming is a transitional speed between burst and sustained swimming which can be maintained for intermediate lengths of time (1-200 minutes).</p>		
MMO-RR94	OffS - Fish and Shellfish	<p>We know that fish will respond to loud noise and vibration, through observed reactions including schooling more closely; moving to the bottom of the water column; swimming away, and burying in substrate (Popper et al., 2014). However, this is not the same as fleeing, which would require a fish to flee directly away from the source over the distance shown in the modelling. We are not aware of scientific or empirical evidence to support the assumption that fish will flee in this manner. The assumption that a fish will flee from the source of noise is overly simplistic as it overlooks factors such as fish size and mobility, philopatric behaviours (foraging, reproductive or</p>	<p>As noted previously, the Applicant acknowledges the MMO's position and confirms the inclusion of UWN modelling for a stationary receptor, which is highly precautionary.</p>	<p>Noted. No further comments</p>

		<p>migratory) which may cause an animal to remain/return to the area of impact. Ultimately, the use of a fleeing fish model relies too heavily on an assumption, rather than being supported by an adequate evidentiary standard befitting of an Environmental Impact Assessment. If the Applicant is aware of new, empirical evidence characterising fish fleeing behaviour which may be of use, the MMO would be happy to review it</p>		
MMO-RR95	OffS - Fish and Shellfish	<p>The MMO emphasises that the authors of the Fish and Shellfish Ecology Technical Baseline have been made aware of the MMO's and Cefas' position on the use of a fleeing receptor in modelling and the lack of evidence to support a 'fleeing' speed of 1.5m/s on various occasions as part of other Offshore Wind Farm applications, and so we presume the inclusion of this within the report to be an error.</p>	<p>The Applicant directs the MMO to the Applicants response to reference MMO-RR93.</p>	<p>Noted.</p>
MMO-RR96	OffS - Marine Mammal	<p>The MMO defers to Natural England for comments on whether all relevant marine mammal receptors have been scoped in for assessment. For marine mammals, the primary species considered in the assessment are grey seal, harbour seal, and harbour porpoise. We believe this was agreed through the Evidence Plan Process.</p>	<p>This is noted by the Applicant.</p>	<p>No further comments.</p>

MMO-RR97	OffS - Marine Mammal	<p>Previous Comments on Annex 6.2 Underwater Noise Technical Report:</p> <p>4.4.3 The MMO note that sections 1.3.9 to 1.3.10 of the report state that “The current version of INSPIRE (version 5.1) is the product of re-analysing all the impact piling noise measurements in Subacoustech Environmental’s measurement database and cross-referencing it with blow energy data from piling logs.... This analysis showed that, based on the most up-to-date measurement data for large piles at high blow energies, the previous iterations of INSPIRE tended to overestimate the predicted noise levels at these blow energies. With this in mind, the current version of INSPIRE attempts to calculate closer to the average fit of the measured noise levels at all ranges”. The MMO welcome this clarification, and acknowledge the drive for reducing unnecessary conservatism in modelling. Allegedly, the current version of INSPIRE should produce more realistic predictions. However, the MMO consider that in light of these, the various claims throughout the PEIR (especially in the Marine Mammal Ecology chapter) that the noise modelling and predictions are ‘highly precautionary’ seem unjustified.”</p>	<p>The Applicant acknowledges the MMO’s concerns regarding the use of the term ‘highly precautionary’. The Applicant’s position is that although the revisions in modelling attempt to reduce conservatism to attempt to be more realistic in its predictions, these are still highly precautionary inasmuch as the more realistic predictions are still based on layers of worst case parameters in piling.</p>	<p>The MMO note the Applicant’s position.</p>
----------	----------------------	---	--	---

		<p>The MMO note that this comment has not been addressed, although it is similar to paragraph 4.4.19 which has been responded to.</p>		
MMO-RR98	OffS - Marine Mammal	<p>“The MMO advise that more caution should be warranted given the lack of measured data for larger piles (in the region of 15 m diameter). The MMO note that previous source level estimates for lower hammer energies (i.e., 5,500 kJ for up to 16 m diameter piles proposed for Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects) were 242.9 dB SPL_{peak} and 224.1 SEL_{ss}, compared to 243.2 dB SPL_{peak} and 224.4 dB SEL_{ss} for VE.”</p> <p>The MMO want to highlight that whilst this point was an observation, it does not appear to be addressed.</p>	<p>The Applicant acknowledges the MMO’s observation. A crude calculation would estimate the difference in acoustic output between 5500 kJ and 7000 kJ in an otherwise like-for-like condition to be approximately 1 dB. The modelling used by the Applicant, based on considerable empirical data, has shown that increases in noise output at high blow energies to be less than this assumption.</p>	<p>The MMO welcome the additional information provided by the Applicant.</p>
MMO-RR99	OffS - Marine Mammal	<p>The MMO can confirm that the caption of Figure 1.3 has been updated for the ES to include the hammer energies for the different piles. As expected, the largest hammer energy considered in the report is 1,600 kJ (for the 9.5 m pile in the North Sea) (which is much smaller than the proposed 7,000 kJ). A new figure – Figure 1.4 has also been added to the report showing a comparison between the</p>	<p>This is noted by the Applicant.</p>	<p>No further comments.</p>

		unweighted SELss measured impact piling data and modelled data using INSPIRE (for the same piles presented in Figure 1.3).		
MMO-RR100	OffS - Marine Mammal	<p>The MMO have previously commented in our Section 42 response that: “The purpose of the noise monitoring is to determine the actual underwater noise levels on site for comparison with the modelled levels presented in Annex 6.2 and used as the basis for the impacts predicted in the EIA, which are themselves intended to be worst-case. The MMO largely agree with sections 1.3.13 – 1.3.14 of Annex 6.2 that the measurements taken during installation will be constrained by the piling plan and site limitations and a direct (like-for-like) comparison with a modelled scenario is unlikely to be possible. Nevertheless, even if the piling locations and choice of transects would not be matched precisely, both modelling and monitoring should provide enough information to deduce some envelope of received level (RL) curves in each case. Thus, some sort of comparison/s in the form of ‘level vs range’ plots (for comparable hammer strike energies), with the associated envelopes of variability, should be possible and would be expected.”</p>	<p>The Applicant is not aware of this being included at any other projects. GIS shapefiles covering 5dB increments have been produced as part of the modelling, which can be used to aid with comparisons with measured data.</p>	<p>The Applicants comments on this point have been noted.</p>

		<p>Level vs range plots are mentioned in section 1.3.13 of the report but from what the MMO can see, the text in this section is the same as that provided at PEIR (no updates or further information provided). We have further addressed this point under comments 4.4.22-4.4.37. In summary, the Received Level curves would not only facilitate sense-checking analysis but could also provide more context for comparing with future monitoring measurements (we acknowledge though that the inclusion of predictions at 750 m is a valuable addition in this direction, although for the scope of checking the cumulative exposure impacts and other potentially longer range results, the model predictions in the further far-field regions also play a very important role).</p>		
MMO-RR101	OffS - Marine Mammal	<p>Piling predictions (single pile):</p> <p>The MMO have reviewed the predictions for piling (of single and consecutive monopiles). Maximum Permanent Threshold Shift (PTS) injury ranges in marine mammals of 7.3 km for very-high frequency (VHF) cetaceans (i.e., harbour porpoise) and < 100 m for phocid pinnipeds (i.e., seals) were predicted using the impulsive SELcum (cumulative sound exposure) criteria (Southall et al., 2019). TTS ranges of 30 km and 14 km</p>	<p>The Applicant acknowledges the MMO's note on low impact ranges for seals. Modelling is quite sensitive down at the very short ranges and small changes in the piling sequence can have noticeable effects on impact ranges. It is expected that the slow start at 10bl/min assisted the cumulative ranges to drop below 100 m. It should be remembered that the practical implication of a difference in impact range of 100 m and, say, a</p>	Noted.

	<p>were predicted for VHF cetaceans and phocids respectively. For fish, a maximum range of 36 km (stationary receptor) was predicted for TTS using the Popper et al. (2014) criteria, as well as potential mortal injury (7.1 km) and recoverable injury (11 km). The MMO consider that the predictions look plausible for VHF cetaceans (and low- and mid-frequency cetaceans) and fish, under the modelling assumptions provided in the report, more specifically the source levels, piling profiles and marine mammal fleeing speeds.</p> <p>For phocids (seals) however, the PTS and TTS predictions look smaller than the MMO would expect. For example, under the modelling assumption that led to the predictions mentioned under paragraph 7.2.6 above, we would expect some modest PTS ranges for phocids (typically a few hundred meters, perhaps up to 1 km). The MMO request that the applicant confirms if the predictions for phocid pinnipeds are correct, or if some particular assumptions have been made regarding the fleeing behaviour and/or noise exposure of the phocids fleeing receptors?"</p> <p>There are some changes to the predicted ranges presented in the ES (compared to PEIR). Please see Annex 2 of this</p>	few hundred metres, would be negligible.	
--	--	--	--

		response for a summary of the predictions.		
MMO-RR102	OffS - Marine Mammal	<p>The MMO notes that the ES report has been updated. In summary, in a 24-hour period there is the potential that up to four pin piles can be driven at a single WTG foundation location per piling vessel (4 piles would take 16 hours duration in total, see Table 1.12 in Annex 6.4). Further scenarios exploring piling at multiple locations have been considered, at the Southern Array – SW corner location and the Northern Array – N edge location to give a wide geographical spread as well as a worst case for water depths. Two different protocols have been investigated. Firstly, a sequential condition was run where pile installations are staggered as an experiment to avoid concurrent piling at multiple locations. Secondly, the concurrent condition had the piles at the north and south of the site installed simultaneously. See paragraphs 4.4.22-4.4.37 for further comments.</p>	This is noted by the Applicant.	Noted.

MMO-RR103	OffS - Marine Mammal	<p>Continuous (non-piling sources):</p> <p>In the MMO's Section 42 response we advised that "Small effect ranges (largely < 100m) have been predicted for other sources of noise including the operational noise from wind turbines, and various construction activities (i.e., cable laying, suction dredging, trenching, rock placement and vessel noise). A fleeing animal receptor has been assumed for all marine mammals, and therefore the predicted effect ranges are minimal." This was more a general observation than a comment requiring action. From the MMO's review of Annex 6.2 presented in the ES, there has been no change to the continuous (non-piling sources) assessment since the PEIR.</p>	This is noted by the Applicant.	Noted.
MMO-RR104	OffS - Marine Mammal	<p>Unexploded Ordnance (UXO) clearance:</p> <p>"The maximum equivalent charge weight for the potential UXO devices that could be present within the VE site boundary has been estimated as 698 kg; this has been modelled alongside a range of smaller devices: 25, 55, 120, 120, and 525 kg. In addition, low-order deflagration has been assessed, which assumes that the donor or shaped-charge (charge weight 0.5 kg) detonates fully but without the follow-up detonation of the UXO.</p>	This is noted by the Applicant.	No further comments

To estimate the potential impact from UXO detonation, an attenuation correction has been added to the Soloway and Dahl (2014) equations for the absorption over long ranges (i.e., of the order of thousands of metres), based on measurements of high intensity noise propagation taken in the North Sea and Irish Sea in similar depths to VE. This uses standard frequency-based absorption coefficients for the seawater conditions expected in the region. The MMO consider the predictions look reasonable. The assessment concludes that the maximum PTS range calculated for UXO is 13 km for the VHF cetacean category, based on the unweighted SPL_{peak} criteria and largest UXO device of 698 kg (we get a PTS prediction of 14.2 km for VHF cetaceans assuming the methodology from Soloway and Dahl and no attenuation correction).”

This was more a general observation than a comment requiring action. From the MMO’s review of Annex 6.2 presented in the ES, there has been no change to the UXO assessment since the PEIR.

MMO-RR105	OffS - Marine Mammal	<p>“With regard to Table 7.2. (Summary of consultation relating to marine mammals). The MMO do not agree that it would be inappropriate to assess the significance of TTS, and believe an assessment of TTS should be included in underwater noise impact assessments, in addition to the assessment of the risk of PTS and disturbance. However, it was agreed that, as a minimum, the predicted TTS effect ranges along with the number of animals at risk should be present in the ES.”</p> <p>The Applicant has addressed this point within Table 7.2 of Chapter 7 Marine Mammals. The Applicant notes that the TTS impact ranges have been presented in Section 7.10, but there has been no assessment of magnitude, sensitivity or significance as previously agreed.</p>	This is noted by the Applicant. As agreed, TTS effects ranges and number of animals have been presented in 6.2.7 Marine Mammal Ecology [APP-076].	Noted, this will be reviewed by the MMO and a response provided by Deadline 3.
MMO-RR106	OffS - Marine Mammal	<p>“With regard to Section 7.5.18: A 5 km Effective Deterrence Range (EDR) for low-order detonations has been assumed, which was suggested by Sofia Offshore Wind Farm. The MMO requested further evidence to support this EDR, and it was noted that Sofia Offshore Wind Farm would be undertaking underwater noise monitoring for low order clearance to provide empirical data to evidence the 5 km EDR. The MMO are</p>	This is noted by the Applicant. The 5 km EDR aligns with the recommended EDR for low-order clearance in the JNCC (2023) Marine Noise Registry. This is the best estimate to be used in the absence of specific data.	Noted.

yet to see empirical evidence to support the 5 km EDR.”

The Applicant has addressed the point for further evidence to support this Evidence Deterrence Range (EDR) within Table 7.2 of Chapter 7 Marine Mammals: “The Applicant recognises that the Sofia Offshore Wind Farm UXO clearance campaign (MLA/2020/00489) had unsuccessful low order clearance attempts and therefore there is no empirical data to support the 5 km EDR (SOWFL, 2023). However, the Applicant is also aware that Moray West Offshore Wind Farm UXO (MS- 00010483) were cleared using EODEX method with 100% success rate. Underwater noise monitoring was conducted for the first 30 detonations, the data has not been analysed as of the time of ES submission, but indications show that low order resulted in noise levels lower than what was modelled. Additionally, the JNCC (2023) Marine Noise Registry recognises the 5 km EDR for low order clearance. The Applicant therefore has presented the following assessment: a 26 km EDR for high order clearance, a 5 km EDR for low order clearance, and TTS as a proxy for both high and low order clearance. See Section 7.1 for methodology approach and Section 7.10 for UXO clearance impact assessment”. The MMO is aware that the JNCC MNR applies a 5 km EDR for low order clearance.

		Hopefully further monitoring data for UXO clearance, including low order, will become available in due course.		
MMO-RR107	OffS - Marine Mammal	<p>“The MMO consider that the claims made throughout the report, particularly in section 7.7.11 of Chapter 7 (that the SELcum PTS predictions are ‘highly precautionary’ and ‘very unlikely to be realised’) are unsubstantiated. “As a result of these and the uncertainties on animal movement, model parameters, such as swim speed, are generally highly conservative and, when considered across multiple parameters, this precaution is compounded therefore the resulting predictions are very precautionary and very unlikely to be realised”. The MMO would argue how ‘uncertainties’ can be ‘highly conservative’. Although it is reasonable to assume that a marine mammal will swim away from the source, the actual concept of fleeing, specifically swimming away from the pile at a constant speed for a sustained period of time (over several hours), is not precautionary. The primary aim of the underwater noise modelling is to present the realistic worst-case scenario. While the MMO acknowledge</p>	<p>The Applicant maintains at that, at present, the estimation of SELcum PTS onset ranges is highly over-precautionary. The current underwater noise modelling for SELcum PTS onset using the Southall et al. (2019) criteria assumes the following:</p> <p>the amount of sound energy an animal is exposed to within 24 hours will have the same effect on its auditory system, regardless of whether it is received all at once (i.e. within a single bout of sound) or in several smaller doses spread over a longer period; and, the sound retains its impulsive character, regardless of the distance to the sound source.</p> <p>However, in practice:</p> <p>there is recovery of a threshold shift if the dose is applied in several smaller doses (e.g. between pulses during pile driving or in piling breaks) leading to an onset of PTS at a higher energy level than</p>	<p>The MMO are currently reviewing the additional information provided by the Applicant and will aim to provide any further comments by Deadline 3</p>

that there may be conservative assumptions made (for instance, that pulsed sound does not lose its impulsive characteristics while propagating away from the source), these conservatisms may be offset by uncertainties surrounding the predicted source levels and fleeing speeds.”

The Applicant has addressed this point within Table 7.2 of Chapter 7 Marine Mammals: “The Applicant maintains that the assessment of cumulative PTS (SELcum) is highly precautionary given the information presented in Section 7.6. The modelling does not account for recovery in threshold shift in between pulses or the loss of impulsive characteristics with distance. With regards to the fleeing model, the model uses typical swimming speeds rather than fleeing speeds which is considered to be conservative”.

This point is not agreed. While the Applicant is correct that the modelling does not account for recovery in threshold shift in between pulses or the loss of impulsive characteristics with distance, as we explained previously, these conservatisms may be offset by the assessment uncertainties, especially regarding the scaling of piling noise and assessment parameters. Furthermore,

assumed with the given SELcum threshold; and, impulsive sound loses its impulsive characteristics while propagating away from the sound source, resulting in a slower shift of an animal’s hearing threshold than would be predicted for an impulsive sound.

Both assumptions therefore lead to a conservative determination of the impact ranges.

While the INSPIRE model attempts to calculate closer to the average fit of the measured noise levels at all ranges (to reduce unnecessary conservatism in the modelling), this still does not take into consideration the impulsiveness of the sound or recovery of the hearing threshold between pulses.

		<p>the Underwater Noise Report in Annex 6.4 specifically states that the current version of INSPIRE attempts to calculate closer to the average fit of the measured noise levels at all ranges (to reduce unnecessary conservatism in the modelling). This is therefore at odds with the (various) claims that the assessment is 'highly precautionary'.</p>		
MMO-RR108	OffS - Marine Mammal	<p>The MMO would be happy to review any updated mitigation plans the Applicant submits (i.e., Marine Mammal Mitigation Plans).</p>	<p>This is noted by the Applicant.</p>	<p>No further comments.</p>
MMO-RR109	OffS - Marine Mammal	<p>Transboundary effects are considered in section 7.16 of Chapter 7 Marine Mammal Ecology. The report appropriately recognises that there may be behavioural disturbance or displacement of marine mammals from the VE site as a result of underwater noise. Behavioural disturbance resulting from underwater noise during construction could occur over large ranges (tens of kilometres) and therefore there is the potential for transboundary effects to occur where subsea noise arising from VE could extend into waters of other European Economic Area (EEA) states. VE OWF is located in close proximity to other states (e.g., French, German waters) and therefore there is</p>	<p>This is noted by the Applicant.</p>	<p>No further comments.</p>

		<p>the potential for transit of certain species between areas. The mobile nature of marine mammals also results in the potential for transboundary effects to occur.</p>		
MMO-RR110	OffS - Marine Mammal	<p>Annex 6.2 Underwater Noise Report details the underwater noise modelling undertaken to support the ES. A summary of the approach to the noise modelling assessment and the results is provided in Annex 2 of this response for reference.</p> <p>There is no change in the report (from the PEIR to ES) from section 1.5 (Other noise sources) onwards. Therefore, our comments are primarily in relation to the installation of monopiles and pin piles at VE.</p> <p>We note the sizable scale of piling parameters considered for the foundation scenarios included in this assessment. In particular, the worst-case monopile scenario assumes the installation of a 15 m diameter pile, with a maximum hammer energy of 7,000 kJ. Furthermore, the maximum hammer energy is applied and sustained over a period of almost 7 hours, which is preceded by a relatively short and steep ramp-up (lasting only 35 minutes).</p>	<p>This is noted by the Applicant.</p> <p>Regarding hammer energies, please see the Applicant's response to MMO-RR111 below.</p>	No further comments.

		<p>The local environmental conditions surrounding the construction site, namely water depths of 40-50 m and above, and seabed sediments made up of gravel and sand combinations, seem, in general, favourable for good sound propagation. Together with the above observations on piling parameters, the overall conditions seem conducive to generate high noise levels both in the near and in the far field.</p>		
MMO-RR111	OffS - Marine Mammal	<p>Comments on the source levels (page 32), predicted noise levels at 750 m (page 42), and the difference between monopile and pin pile level predictions:</p> <p>We appreciate the inclusion of the information about noise level predictions at the distance of 750 m from the source (Table 1.15 of the Underwater Noise Report), in addition to the source level values (Table 1.13). While the source levels are essentially a modelling concept and are in general best understood only within the particular context of the chosen propagation model and modelling setup, the predictions at 750 m have the particular advantage (as acknowledged in the report) of being comparable with other modelling predictions or, indeed, with measurements (either from similar environments or from future monitoring at the current site).</p>	<p>The Applicant does not agree that the variation in parameters leads to as great a difference in underwater noise levels (“source”, or at any position) as would be suggested by the MMO, following von Pein et al. (2022). Following their methodology would lead to predictions of noise, noise impacts and impact ranges that would be vastly greater than have been monitored in real situations.</p> <p>The intentions of the paper represent a welcome contribution to the literature, but we would urge caution in the application of their conclusions. The authors apply a relatively simplistic calculation methodology, stating effectively that the effect of a doubling in energy leads to a 3 dB increase in noise level for any doubling of energy e.g.</p>	<p>The MMO notes the Applicants comments and we are currently reviewing the information provided with our scientific advisors at Cefas. Any additional comments will be provided by Deadline 3.</p>

Having said the above, we observe that the predicted noise level values do not seem particularly high, especially when considering the piling parameters assumed for monopiles (namely, 7000 kJ blow energy and 15 m diameter pile) which are considerably larger than the corresponding pin pile parameters (4000 kJ and 3.5 m diameter pile). However, the SPL_{peak} and SEL_{ss} values are only about 1.5–2 dB higher when comparing the monopile predictions with the corresponding pin pile predictions. The increase in blow energy alone could plausibly account for this relatively modest increase in predicted noise levels; however, this is at odds with the emerging evidence from literature, which suggests that the pile diameter is also a very important factor in the scaling of the piling noise (von Pein et al., 2022). In particular, the increase of pile diameter by a factor of 4 (as in the present case) could add some additional 9–10 dB to the SEL_{ss} values at 750 m (cf. Fig 10, eq. 10-12 from von Pein et al., 2022). In this context, we also note that the report acknowledges that the INSPIRE model is based on existing empirical data, which allegedly does not exist for the parameters relevant for the foundations assessed herein, and thus needed to be extrapolated, based on the existing trends, up to the scale of piling anticipated for the current application.

500 kJ to 1000 kJ, or 3000 kJ to 6000 kJ. In practice it is much more complex than this, and the increases at higher energies lead to an increase much lower than 3 dB.

They also appear to greatly overestimate the effect of diameter. Their validation data in section 5.2 for pile diameter, although fitting in wide bounds of 7.5 dB, also show empirical noise levels that appear to be trending down at the largest pile diameters, and are almost identical at 3.5 m diameter as at 7.8 m.

Subacoustech's research indicates that pile diameter, although contributory, has a relatively small effect on noise emission. As above a scaling law leading to an increase of 9-10 dB (we assume the MMO means Fig 7, there is no Fig 10) as a result of a changing pile diameter (pin pile vs monopile at Five Estuaries) alone would produce noise level predictions that would be much greater than have been seen in direct measurements and lead to a greatly over-conservative assessment.

MMO-RR112	OffS - Marine Mammal	<p>Comments on the worst-case SPLpeak predicted levels at 750 m, compared to the worst-case PTS predictions for VHF cetaceans (202 dB peak pressure threshold):</p> <p>We note that when considering the maximum blow energy of 7000 kJ for monopiles, the worst case unweighted SPLpeak prediction at 750 m is 202.8 dB (Table 1.15) at all three modelling locations, which actually slightly exceeds the PTS threshold value of 202 dB SPLpeak for VHF cetaceans under the Southall et al. (2019) impulsive criteria. This indicates that the maximum PTS ranges for VHF cetaceans would be slightly larger than 750 m (approximately 800–820 m in our estimates). However, the summary results in Tables 1.16, 1.21 and 1.26 predict maximum ranges of only 730m, 730m and 740m at the three modelling locations, respectively for VHF cetaceans.</p> <p>Notwithstanding the above observation, following our sense checking of modelling</p>	<p>The Applicant welcomes the MMO’s broad agreement with the results of the underwater noise modelling, and their effort in checking to confirm modelling.</p> <p>The MMO is correct in relation to the comments for the 202 dB SPLpeak prediction at 750 m and the VHF cetacean criterion. This occurred because of different transect step resolutions that can be used in the modelling. The model can calculate the noise level at different steps away from the source, which depending on the use are generally between 1 m and 100 m; smaller steps are suitable for shorter range calculations. Where different step sizes are used in different calculations, as is the case for the noise level calculations at ‘source’ and for 750 m, and for calculation of impact ranges, then there can be discrepancies, akin to rounding errors; the more detailed modelling (smaller steps) tend to be more</p>	<p>The MMO welcome the clarification and additional information provided by the Applicant. We are currently reviewing the information provided along with our scientific advisors at Cefas. Any additional comments will be provided by Deadline 3.</p>

outputs presented throughout the report, we have been able to reasonably match the Subacoustech predictions for marine mammals and fish, based on the modelling parameters and assumptions as provided in the report, such as the source levels (note however the previous comment on source level and predicted levels at 750 m), piling profiles and marine mammal fleeing speeds. It should be noted that our internal sense checking process follows a streamlined approach (for example, using generic textbook-like values for parametrising the environmental properties, such as those of the seabed and of the water column, or the use of coarser numerical grids and bathymetric discretisation, and generic source spectra), and thus is not intended to match exactly the outputs of a fully-customised model (which could include, for example, validation/calibration of the transmission loss, refining of source spectra, etc.), but rather to explore the envelope of variability for the main modelling outputs and thus check the plausibility of the predictions presented in the report.

Some of the predictions (e.g., the predictions for fish species) compare favourably with our estimates, while others seem to sit closer to the lower end

accurate and typically result in slightly smaller ranges. In this case the calculation of impact ranges, rather than the level at 750 m, was undertaken with greater detail.

The addition of noise levels at 750 m are relatively repeatable and consistent before there is significant environmental effects with transmission losses. The inclusion of a nominal Receive Level curve necessarily follows a specific transect, and the monitoring of this specific transect for validation in the future would almost certainly not be possible. We would suggest that for site validation, the use of predicted noise levels at 750 m will be of the greatest usefulness.

It should be noted that Outline Marine Mammal Mitigation Protocols for Piling and UXO [APP-244 and APP-245 respectively] have been submitted with the application.

of the envelope of plausible outcomes (e.g., the PTS ranges for cumulative exposure for marine mammals). This could be explained by a number of factors, including the propagation loss and source spectra assumption, as mentioned above, although this remains somewhat speculative lacking explicit evidence that would facilitate a more in-depth comparison and analysis (e.g., curves of the received level (RL) versus range (unweighted and/or weighted), source spectra). As mentioned in our previous Section 42 response, the RL curves would not only facilitate such sense-checking analysis but could also provide more context for comparing with future monitoring measurements. We do acknowledge though that the inclusion of predictions at 750 m is a valuable addition in this direction, although for the scope of checking the cumulative exposure impacts and other potentially longer range results, the model predictions in the further far-field regions also play a very important role.

Given the assessment uncertainties as outlined above, the focus should be on ensuring that appropriate mitigation measures are secured to reduce the risk of potential impacts. The MMO would be

		happy to review any marine mammal mitigation plans.		
MMO-RR113	OffS - Marine Mammal	The MMO welcomes that additional noise modelling has been undertaken to assess impact piling for the construction of a sheet piled enclosure at the landfall location on the Essex coast between Holland-on-Sea and Frinton-on-Sea. Although it is expected that vibro-piling will be used for these activities, impact piling has been presented to represent a worst case with regards to noise as this has not been ruled out. The MMO considers this to be appropriate.	Noted by the Applicant	No further comments.
MMO-RR114	OffS - Marine Mammal	<p>In summary, a single scenario has been modelled, considering the installation of 750 mm wide Larssen sheet piles, measuring 20 m in length using the assumed ramp up given in Table 1-1. It is possible that eight piles could be sequentially installed in a 24- hour period; this has been considered in the modelling.</p> <p>The modelling results show that noise levels and ranges for potential impacts will be greater during high tide conditions. The report concludes that “all ranges at</p>	The Applicant can clarify that sea area around the landfall area location as modelled, at least within 1 km, is reasonably flat. The depth at the landfall location is 0.8 m at MLWS and 5.3 m at MHWS.	The MMO welcome the additional information provided by the Applicant and is currently reviewing the information provided along with our scientific advisors at Cefas. Any additional comments will be provided by Deadline 3.

		<p>which PTS and TTS impacts could occur for marine mammals are expected to be less than 100 m. For fish, the maximum TTS range (186 dB SELcum threshold) is predicted to be 160 m for a single pile, increasing to 460 m when 8 sequentially installed piles are considered” (for a stationary receptor).</p> <p>Nevertheless, the modelling report lacks information on the environment where piling will occur. Figure 1-1 for example, shows the landfall area as well as the representative modelling location used for this study. It would be helpful if this figure could also show the bathymetry of the domain. There is no indication of the water depths at the piling source. The report simply states: “as the furthest from land and therefore deepest location, this represents the location likely to lead to the largest potential impact ranges”.</p>		
MMO-RR115	OffS - Marine Mammal	<p>Furthermore, the report provides the unweighted SPLpeak and SELss source levels in Table 1-2 (below for reference). Both high and low tides have been considered for this modelling using tidal data from the Walton-on-the-Naze:</p> <ul style="list-style-type: none"> • Mean High Water Springs (MHWS): 4.6 m above lowest astronomical tide (LAT); and 	<p>The source levels and its transmission are strongly influenced by the shallow water in this location. Subacoustech has found that deeper water leads to a greater apparent source level, which, where the depths are in the region of 30-40m, will not make a substantial difference, but when the depths are very shallow (<10m, LAT is 0.7m) as here, the reduction is significant and</p>	<p>The MMO welcome the additional information provided by the Applicant and is currently reviewing the information provided along with our scientific advisors at Cefas. Any additional comments will be provided by Deadline 3.</p>

- Mean Low Water Springs (MLWS): 0.1 m above LAT.

Table 1-2 Summary of the unweighted source levels used for modelling.

Source levels	Sheet pile (MHWS) 750 mm wide, 300 kJ blow energy	Sheet pile (MLWS) 750 mm wide, 300 kJ blow ene
Unweighted SPL _{peak}	224.0 dB re 1 µPa @ 1 m	216.7 dB re 1 µPa @ 1 m
Unweighted SEL _{5s}	194.2 dB re 1 µPa ² s @ 1 m	171.0 dB re 1 µPa ² s @ 1 m

We request further evidence to justify the source levels assumed in the modelling. We note for previous/other assessments, typical impact piling source levels for a similar hammer energy (i.e., 350 kJ) were higher than what is assumed here. The (low) source levels assumed in this assessment explains the modelled outputs (predicted impact ranges) presented.

Given the assessment uncertainties as outlined above, the focus should be on ensuring that appropriate mitigation measures are secured to reduce the risk of potential impacts. The MMO would be happy to review any marine mammal mitigation plans that the Applicant submits.

the sound will also attenuate rapidly. For these reasons the Applicant is confident the source levels are appropriate.

MMO-RR116

OffS - Fisheries

MMO defers to the National Federation of Fishermen's Organisations and Sussex Inshore Fisheries and Conservation Authorities, along with standalone representatives on matters of

Noted by the Applicant.

No further comments.

MMO-RR117	OffS - Shipping and Navigation	The MMO defers to the Maritime and Coastguard Agency and Trinity House on matters of shipping and navigation. The MMO will continue to be part of the discussions relating to securing any mitigation, monitoring or other conditions.	Noted by the Applicant.	No further comments.
MMO-RR118	OffS - Aviation	The MMO defers to the Civil Aviation Authority, Ministry of Defence and Maritime and Coastguard Agency on matters of Civil and military aviation and supports any comments raised. The MMO will continue to be part of the discussions relating to securing any mitigation and monitoring or other conditions required within the DMLs.	Noted by the Applicant.	No further comments.
MMO-RR119	OffS - SLVIA	The MMO defers to Natural England as the SNCB on matters of Seascape, Landscape and Visual Resources. The MMO will continue to be part of the discussions relating to securing any mitigation and monitoring or development of any plans/conditions on this matter.	Noted by the Applicant.	No further comments.
MMO-RR120	OffS - Archaeology	The MMO defers to the Historic England on matters of shipping and navigation. The MMO will continue to be part of the discussions relating to securing any mitigation, monitoring or other conditions.	Noted by the Applicant.	No further comments.

MMO-RR121	Gen - Other	<p>The MMO has multiple concerns in relation to both the details within the ES and the conditions within the DMLs.</p> <p>We strongly recommend that the Applicant engage with the MMO throughout the process in order to ensure the assessment is as smooth as possible and agreements can be reached through a Statement of Common Grounds (SoCG).</p>	<p>Noted by the Applicant. The Project is developing a SoCG with the MMO and hopes to address these concerns.</p>	<p>The MMO can confirm that it is working with the Applicant to develop a SoCG.</p>
-----------	-------------	--	---	---

1.2 Benefit of the Order

- 1.2.1 The MMO note the Applicants comments regarding the Benefit of the Order but disagrees with the rational provided. The MMO objects to the provisions relating to the process of transferring and/or granting the deemed marine licences set out in the draft DCO at Article 5 and our position on the matter, in response to the Applicants comments in MMO-RR01 to MMO-RR14 of PD4-006 Five Estuaries Offshore Wind Farm Ltd 10.4 Applicant’s Response to Relevant Representations.
- 1.2.2 If the application for the DCO is granted, the MMO will be the regulatory authority responsible for the enforcement of the provisions of the DMLs. As a result, it has to retain a record of the DML and who holds the benefit of that license in order to be able to fulfil its statutory responsibilities as it does in respect of any other Marine Licence.
- 1.2.3 The Marine and Coastal Access Act (“the 2009 Act”) addresses the procedure for transfer of a Marine Licence as follows:
- “(7) On an application made by a licensee, the licensing authority which granted the licence—*
(a) may transfer the licence from the licensee to another person, and
(b) if it does so, must vary the licence accordingly.
(8) A licence may not be transferred except in accordance with subsection (7).”
- 1.2.4 The purpose of these provisions is to ensure that there is at all times a record of the person who has the benefit of the licence. That is because pursuant to the Marine and Coastal Access Act 2009 section 65(1), no person may carry on a licensable marine activity, or cause or permit any other person to carry on such an activity, except in accordance with a marine licence granted by the appropriate



licensing authority. A person who contravenes section 65(1), or fails to comply with any condition of a marine licence, commits an offence (see section 85(1) of the 2009 Act).

- 1.2.5 Thus, it is a key part of the enforcement provisions of the 2009 Act, that the MMO maintains a record of the person who has the benefit of a marine licence at all times.
- 1.2.6 In practice, the process of obtaining a transfer is relatively quick. Whilst the MMO officially indicates that this can take up to 13 weeks, it is an administrative task and in practice often much quicker and around 6 weeks. The MMO is not required to consult with any other body. As far as it is aware, the MMO has never refused a request to transfer a Marine Licence.

The current draft DCO Article 5 Procedure

- 1.2.7 As presently drafted, dDCO Article 7(2) creates a power whereby the undertaker can:
- a) transfer to another person (“the transferee”) any or all of the benefit of the provisions of this Order (including the deemed marine licences); or
 - b) grant to another person (“the lessee”) for a period agreed between the undertaker and the lessee any or all of the benefit of the provisions of the Order (including the deemed marine licences).
- 1.2.8 These provisions are also duplicated in large part by Article 7(3) which provides a power to the undertaker to:
- a) where an agreement has been made in accordance with sub-paragraph (2)(a), transfer to the transferee the whole of any of the deemed marine licences and such related statutory rights as may be agreed between the undertaker and the transferee; or
 - b) where an agreement has been made in accordance with sub-paragraph (2)(b), grant to the lessee, for the duration of the period mentioned in sub-paragraph (2)(b), the whole of any of the deemed marine licences and such related statutory rights as may be so agreed.
- 1.2.9 The consent of the Secretary of State to a transfer/grant pursuant to Article 7(2) or 7(3) is required except where Article 7(8) applies. Where the Secretary of States consent is required, the dDCO provides that:
- a) The undertaker must consult the Secretary of State before making an application for consent under this article by giving notice in writing of the proposed application (see dDCO Article 7(5)); and



- b) The Secretary of State must consult the MMO before giving consent to the transfer or grant to another person of the benefit of the provisions of the deemed marine licences (see dDCO Article 7(6)).

1.2.10 The Secretary of State's consent to the transfer or grant of a DML is not required and thus there is no requirement for consultation with the MMO prior to the undertaker making that transfer or grant where:

- a) the transferee or lessee is the holder of a licence under section 6 of the 1989 Act (licences authorising supply etc.); or
- b) the transferee or lessee is a holding company or subsidiary of the undertaker; or
- c) the time limits for claims for compensation in respect of the acquisition of land or effects upon land under this Order have elapsed and—
 - i. no such claims have been made,
 - ii. any such claim has been made and has been compromised or withdrawn,
 - iii. compensation has been paid in final settlement of any such claim,
 - iv. payment of compensation into court has taken place in lieu of settlement of any such claim, or
 - v. it has been determined by a tribunal or court of competent jurisdiction in respect of any such claim that no compensation is payable.

1.2.11 The dDCO also provides for 14 days written notice to be provided to the MMO prior to a transfer or grant taking effect and for certain details to be provided (dDCO Article 7(11)). These include a copy of the document effecting the transfer or grant signed by the undertaker and the person to whom the benefit of the powers will be transferred or granted (dDCO Article 7(10)(b)).

The Basis for Objection

1.2.12 The MMO raises objection to Article 7 in relation to:

- a) The procedure seeking to duplicate the existing statutory regime set out in s72 of the 2009 Act
- b) The proposed procedure being cumbersome, more administratively burdensome, slower and less reliable than the existing statutory regime set out in s72 of the 2009 Act;
- c) The overlap in relation to DMLs as between Article 7(2) and 7(3);
- d) The power for an undertaker to grant a DML;
- e) The power to grant a DML for a period of time;
- f) The basis for disapplication of the need for Secretary of State's consent to a transfer/grant for DML is unrelated to any matters relating to marine licensing.
- g) The absence of any power provided to the MMO to change the DML held in its records to reflect any transfer.



h) The overall effect on the ability of the MMO to enforce the marine licensing regime in respect of any transferred or granted DML.

Previous DCOs

- 1.2.13 It is acknowledged that DCO's previously granted have removed the effect of s72 of the 2009 Act and made provision for the transfer of DMLs including by way of example, Sheringham Shoal and Dudgeon Extensions Offshore Wind Farm, Times Tideway Tunnel DCO and Sizewell C DCO. The MMO has consistently challenged provisions of this nature in draft DCOs as the existing statutory procedure is to be preferred to mitigate risk on all parties by using established mechanisms. For instance the MMO has contested this in the recent Sheringham Shoal and Dudgeon Extensions Offshore Wind Farm (OWF) DCO, Rampion 2 OWF DCO, Immingham Green Energy Terminal DCO and the Immingham Eastern Ro-Ro Terminal.
- 1.2.14 The MMO note that very few if any of the relevant Examining Authorities ("ExAs") of these projects explain the rationale for the approach adopted. The same is true of the relevant decision letters. The MMO requests that the Applicant provides the MMO with any ExA Report or Decision letter which explains why the approach it seems to adopt in the dDCO is appropriate or indeed to be preferred to the existing statutory procedures.
- 1.2.19 The MMO, of course, accept that there is a need for consistency in decision making. However, a decision maker is not bound by previous decisions and can depart from them where there is good reason to do so.
- 1.2.20 If the Secretary of State in the present case determined that on balance, the existing statutory mechanisms relating to transfer of marine licenses is to be preferred to the mechanism proposed in the dDCO, then it is open to him to so determine provided he gives reasons for so doing. The absence of any reasoned decision which determines the point previously and which provides a rationale for departing the existing statutory mechanism is a reason to look at this issue again.

Materially Inferior Procedure

- 1.2.21 As explained above, the statutory system for transfer requires an application to the MMO. There is no further consultation, and the transfer is given effect by amendment to the licence holder section of the Marine Licence. The MMO does not have any relevant statutory or non-statutory policy relating to the transfer of a licence – it is essentially a purely administrative act to ensure that the licence contains the name of the person with the benefit of the licence. As explained, as far as the MMO is concerned it has never refused an application for a transfer.
- 1.2.22 In contrast, the dDCO Article 7 procedure requires:
1. Pre-application consultation with the Secretary of State
 2. An application to the Secretary of State;
 3. Consultation with the MMO;
 4. A decision by the Secretary of State;
 5. Notification of the decision;



- 1.2.23 Given the contrast between the two procedures, the MMO does not consider that the dDCO procedure has any material procedural or administrative advantages over the existing statutory process. Indeed, the dDCO procedure is decidedly more complex, is more administratively burdensome for all parties, and will take longer to give effect to a transfer. The MMO believes that as a result the dDCO should be amended to remove the mechanisms to enable transfer of the DMLs and to remove the exclusion of the existing s72 process; the statutory regime which already exists is a much better option for all and should remain applicable.

The Overlap

- 1.2.24 There is an overlap in the powers set out in the dDCO Article 7(2) and Article 7(3) in that the DMLs can be transferred under both. It is entirely unclear why this is required.
- 1.2.25 The equivalent provision in the Sheringham Dudgeon scheme to dDCO Article 7(2) is at Appendix A. It provides:
7(2) Subject to paragraphs (6), (7) and (8) the undertaker may with the written consent of the Secretary of State—
- (a) transfer to another person (“the transferee”) any or all of the benefit of the provisions of this Order (**excluding the deemed marine licences** referred to in paragraph (3) below) and such related statutory rights as may be agreed between the undertaker and the transferee; and
 - (b) grant to another person (“the lessee”) for a period agreed between the undertaker and the lessee any or all of the benefit of the provisions of the Order (**excluding the deemed marine licences** referred to in paragraph (3) below) and such related statutory rights as may be so agreed. except where paragraph (8) applies, in which case no consent of the Secretary of State is required.”
(emphasis added)
- 1.2.26 Thus, in the Sheringham case, Article 5(2) did not address the transfer of a DML at all nor did it provide for the grant of a DML by the undertaker; rather the powers in relation to DMLs were addressed in Article 5(3) of the Sheringham DCO:
“5(3) Subject to paragraph (6), the undertaker may with the written consent of the Secretary of State and where an agreement has been made in accordance with paragraph (2)(a), transfer to the transferee the whole of any deemed marine licences and such related statutory rights as may be agreed between the undertaker and the transferee, except where paragraph (8) applies, in which case no consent of the Secretary of State is required.”
- 1.2.27 Thus, the Sheringham DCO provided only for the transfer of a DML to another party. **It did not provide the ability to grant a DML for a period agreed by the undertaker.**
- 1.2.28 The wording which has been changed in the dDCO in the present case to include marine licences within Article 7(2) has no precedent which the MMO has been able to identify and has not been justified by the Applicant.
- 1.2.29 The Sheringham DCO addressed the powers relating to the transfer of DMLs separately from the transfer of other rights i.e., the DML related powers were addressed in Article 7(3) and not 7(2).



- 1.2.30 The drafting of dDCO in the present case for Article 7(3) continues to relate to DMLs. But that has given rise to an unnecessary and confusing duplication of powers as between dDCO Articles 7(2) and 7(3).
- 1.2.31 If the dDCO is to contain provisions relating to the transfer of a DML, it is much better to amend dDCO Article 7(2) to exclude DMLs and to have transfer addressed in a separate provision i.e. 7(3) as was done in Sheringham. The overlap of powers must be addressed by further changes to the draft.

The Grant of a DML

- 1.2.32 dDCO Articles 7(2)(b) and 7(3)(b) seek to make provision for the undertaker to “grant” another person the “benefit of the provisions of the Order (including the deemed marine licences) and such related statutory rights as may be so agreed” or “the whole of any of the deemed marine licences and such related statutory rights as may be so agreed”.
- 1.2.33 This appears to be drawn from Article 9(1)(b) of the Sizewell C DCO, although it is unclear from the wording of that provision whether the power to grant “the benefit of the provisions of this Order and such related statutory rights” includes the power to grant a new DML to a third party. Further, the rationale for the inclusion of such a power or the basis upon which it is to be exercised is not explained in the DCO, the ExA Report or the Decision Letter for the Sizewell C project.
- 1.2.34 The Applicant has not justified or explained:
Why it is necessary for it to have the power to **grant** a DML;
Why it is necessary for it to have the power to **grant** a DML when it would have a power to transfer a DML;
The basis on which such a power to grant will be exercised;
The basis on which it will determine whether or not grant a DML
The basis on which it will determine the conditions to be imposed on the grant of a DML;
Why it is appropriate for it to be able to grant DMLs without the consent of the Secretary of State or the MMO
- 1.2.35 The MMO considers that the power sought for the undertaker to grant a DML would confuse and usurp its statutory function. It would allow licences to be granted on terms wholly different from those accepted as part of the DCO process. The power to grant a DML should therefore be removed from the dDCO.
- 1.2.36 In the event that its primary position that the existing statutory mechanism should remain applicable is rejected, the MMO considers that, at most, the power to transfer the benefit of an existing DML to another person is all that is required.

A Time Limited DML

- 1.2.37 dDCO Articles 5(2)(b) and 5(3)(b) also seek to make provision for a DML to be granted by the undertaker to another person for a limited period of time.
- 1.2.38 The only precedent for this provision which the MMO has found is Article 9(1)(b) of the Sizewell C DCO, to the extent that that power applies to DMLs (which is unclear). The Sheringham DCO does not provide a power for the undertaker to grant a DML for a



limited period of time.

- 1.2.39 The Applicant has not explained why these provisions are necessary or why a departure from the statutory provisions within the 2009 Act is justified.
- 1.2.40 In the event that its primary position that the existing statutory mechanism should remain applicable is rejected, the MMO considers that, if the intention is to enable the transfer of the benefit of a DML to a third party for a defined period of time, with the benefit of that DML then reverting to the undertaker at the end of that period, a provision can be drafted to give effect to this.

Disapplication of the Secretary of State's Consent

- 1.2.41 As explained above, Article 7(8) disapplies the need for the consent of the Secretary of State to be obtained and the need for any consultation with the MMO where:
- (a) the transferee or lessee is the holder of a licence under section 6 of the 1989 Act (licences authorising supply etc.); or
 - (b) the transferee or lessee is a holding company or subsidiary of the undertaker; or
 - (c) all claims for compensation in respect of the acquisition of land or effects upon land under this Order have elapsed or been resolved
- 1.2.42 Whilst it is recognised that the drafting here reflects earlier DCOs, the rationale for the removal of the need for consent or consultation when any of these criteria are met has not been explained. The Applicant has not explained why the fact that the transferee holds a s6 licence should mean that the consent of the Secretary of State is not required nor that consultation with the MMO is unnecessary. The Applicant has not explained why a transfer of a DML to a holding company or subsidiary of the undertaker should mean that the consent of the Secretary of State is not required nor that consultation with the MMO is unnecessary.
- 1.2.43 Lastly, it is entirely unclear to the MMO why there should be a need for consultation with the Secretary of State (and consultation with the MMO) relating to a transfer of a DML prior to the resolution of claims for compensation for land acquisition but not afterwards. The rationale for this provision has not been explained by the Applicant.
- 1.2.44 In the absence of any clear justification for excluding a consent process, consent should be required to reflect the process in section 72 of the 2009 Act. In other words, a transfer of a DML should not be given effect unless it has been approved by a decision maker. The MMO's primary position is that the statutory mechanism should remain applicable and that it should remain the relevant decision maker. If that is rejected then the next best option would be for the Secretary of State to be the relevant decision maker but unable to consent to the transfer without the approval of the MMO. If that is rejected, then the next best option would be for the Secretary of State to be the relevant decision maker in consultation with the MMO. It is not acceptable, however, for the Applicant (or any successor) to be able to transfer a DML to whomever they wish whenever they wish which is eventually the effect of the provisions in the dDCO.



Power to Amend DMLs to Reflect a Transfer

- 1.2.45 The MMO is a statutory body. As a result, it can only act where it has statutory power to do so. The dDCO provides for the transfer of a DML, however it does not give the MMO the power to amend the DML it holds in its records upon notification that a transfer is to occur. This has the potential to cause real difficulties going forward since, in the absence of such a power, the MMO records will not be changed. This is likely to cause significant administrative difficulties and could result in obstacles to enforcement.
- 1.2.46 Such a confusion is but one symptom of the complications which result from the dDCO's proposed transfer mechanism. This reinforces the MMO's primary position that the existing statutory mechanism is to be preferred and to remain applicable.

Overall Effect on Ability to Enforce

- 1.2.47 As drafted, the ability to transfer licences, grant licences for a limited time, to transfer/grant without consultation and without providing a power for the MMO to amend its records, will give rise to significant enforcement difficulties for the MMO and has the potential to prejudice the operation of the system of marine regulatory control in relation to the proposed development. Further, the dDCO procedure is administratively burdensome and time consuming.
- 1.2.48 All of these difficulties can be avoided by retaining the existing statutory regime which is simple to operate and relatively speedy. The best way forward for all concerned is to retain the statutory procedure for transfer as set out in s72 of the 2009 Act. This will also require changes to Part 1 Paragraph 7 of each dDML.
- 1.3 PD4-009 Five Estuaries Offshore Wind Farm Ltd 10.7 Notification of Intention to Submit a Change Request

- 1.3.1 The MMO note the Applicant has submitted a change request to the Planning Inspectorate. The following changes are of interest to the MMO are:
1. The reduction of the maximum Wind Turbine height from 399m to 370m above lowest astronomical tide
 2. The removal of Gravity Base Structures as a foundation option (this is following comments from the MMO and NE)
 3. Reduction of offshore array boundary.
- 1.3.2 Should the change request be accepted by the Planning Inspectorate, the MMO will provide comments at the most suitable deadline.



1.4 PD-009 Rule 8 Notification of timetable for the examination

- 1.4.1 The MMO note that the date for Deadline 7 in Annex A is the 03 March 2025, however, in Annex B it is noted that the date for Deadline 7 is the 04 March 2025. Please could the deadline date be clarified.

Yours Faithfully

Nicola Wilkinson
Marine Licensing Case Manager

████████████████████
████████████████████@marinemanagement.org.uk

