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6 November 2023

Dear Richard Allen,

Planning Act 2008, E.On Climate and Renewables UK Ltd, Proposed Rampion 2 Offshore Wind Farm Order

This document comprises the Marine Management Organisation's ("MMO") initial comments in respect of the above Development Consent Order ("DCO") application ("DCO Application") in the form of a relevant representation.

This is without prejudice to any future representation MMO may make about the DCO Application throughout the examination process. This is also without prejudice to any decision 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's role in Nationally Significant Infrastructure Projects (NSIPs)

The MMO was established by the Marine and Coastal Access Act 2009 (the "2009 Act") to make a contribution to sustainable development in the marine area and to promote clean, healthy, safe, productive, and biologically diverse oceans and seas.

The responsibilities of the MMO include the licensing of construction works, deposits and removals in English inshore and offshore waters and for Northern Ireland offshore waters by way of a marine licence. Inshore waters include any area which is submerged at mean high water spring ("MHWS") tide. They also include the waters of every estuary, river or channel where the tide flows at MHWS tide. Waters in areas which are closed permanently or intermittently by a lock or other artificial means against the regular action of the tide are included, where seawater flows into or out from the area.

In the case of NSIPs, the Planning Act 2008 (the "2008 Act") enables DCOs for projects which affect the marine environment to include provisions which deem marine licences.

As a prescribed consultee under the 2008 Act, the MMO advises developers during pre-application on those aspects of a project that may have an impact on the marine area or those who use it. In addition to considering the impacts of any construction, deposit or removal within the marine area, this also includes assessing any risks to human health, other legitimate uses of the sea and any potential impacts on the marine environment from terrestrial works.

Where a marine licence is deemed within a DCO, the MMO is the delivery body responsible for post-consent monitoring, variation, enforcement, and revocation of provisions relating to the marine environment. As such, the MMO has a keen interest in ensuring that provisions drafted in a deemed marine licence ("DML") enable the MMO to fulfil these obligations.



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Further information on licensable activities can be found on the MMO's website [here](#). Further information on the interaction between the Planning Inspectorate and the MMO can be found in our joint advice note 11 Annex B [here](#).

Relevant Representation

On the 20 September 2023 the MMO received notice under Section 56 of the 2008 Act that the Planning Inspectorate ("PINS") had accepted an application made by E.On Climate and Renewables UK Ltd (the "Applicant") for a DCO Application (MMO ref: DCO/2019/00005; PINS ref: EN010117).

The DCO Application includes a draft DCO and an Environmental Statement (the "ES"). The DCO includes, at Schedule 11 and 12 a draft Deemed Consent under Part 4 (Marine Licensing) of the Marine and Coastal Access Act 2009 (the DML).

The DCO Application seeks authorisation for the construction, operation and maintenance of Rampion 2 Offshore Wind Farm ("Rampion 2"), comprising of up to 116 wind turbine generators together with associated onshore and offshore infrastructure and all associated development (the "Project").

Please find MMO comments below.

Yours sincerely



Harriet Tyley
Marine Licensing Case Officer

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1 The Proposed Development

1.1 Proposed Development Details

- 1.1.1 Rampion 2 Offshore Wind Farm will be adjacent to and form an extension to the existing Rampion Offshore Wind Farm, and all infrastructure required to transmit the power generated, to the Bolney National Grid Substation.
- 1.1.2 The proposed development includes an offshore generating station with an electrical export capacity of in excess of 100 Megawatts (MW) comprising up to 90 turbines, and array cables, in an area approximately 196 square kilometres (km²), located approximately 13 kilometres (km) south of the Sussex coast located to the west of the existing Rampion Offshore Windfarm.
- 1.1.3 The proposed development will comprise up to three offshore substations. Cables between the wind turbine generators (WTG) between the WTGs and the offshore substations, and between the offshore substations themselves and the landfall location at Climping, West Sussex. An underground cable connection between the landfall and a satellite substation known as Oakendene, and then onwards to connect into the existing National Grid substation at Bolney, together with an extension to the existing substation.
- 1.1.4 Two DMLs are included in the draft DCO, one in relation to the generation assets and the second in relation to the transmission assets.

2 General comments on the application

2.1 Marine Plans

- 2.1.1 The Applicant should demonstrate that they have considered whether the project adheres to all the relevant marine plans and policies in the area. 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 Marine Plans tool and policy information on the following website:

<https://www.gov.uk/guidance/explore-marine-plans>

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.

2.2 Fishing Community

- 2.2.1 The MMO has received the following Tier 1 complaint from commercial fisherman working along the Sussex Coast. The MMO views the complaint as a major issue, and resolution of the below is strongly recommended during examination, MMO has also advised the fisherman to register as an interested party and submit a representation.

"I'm a commercial fisherman from the Sussex coast and I would like to enlighten you about the devastation Rampion has caused to marine life.

I am talking about the Rampion wind farm 7 miles off the coast of Worthing Sussex that spans 7 miles long and 4miles wide and is soon to be extended west towards Littlehampton West Sussex. The reason why I am writing to you is, when all the trenches were dug on the sea bed for the cable routes also trenches and foundations dug within the windfarm it's self they told us fisherman in one of many meetings that we had with them that all the spoil I. E. rocks and boulders would be buried back down the trenches after the cables were laid and it would be large rocks, small rocks on top of that then sand and gravel to cover everything, well as we told them before they disturbed the sea bed it was compact and once they dug the trenches and put the cables down they realised that they were left with hundreds of thousands of tons of rocks that wouldn't go back down the hole. So obviously they needed somewhere to put these rocks and without asking anyone or even consulting us commercial fishermen who make our living from these grounds they dumped them in piles about every 50mtrs in a 7 mile radius!

The bay that we are in is renowned of shallow water so the first gale of wind all these piles were knocked over to leave loose boulders rolling around on what was already quite a hard seabed. Because the sea bed was already hard there is no way these rocks are going to bed in or take root so for the past 3 years it only takes a big tide or a little bit of wind and these rocks are rolling around, now this has absolutely ruined the area for us fishermen as we fish bottom nets we are ripping nets up quicker than

we can make them most of the time, also it has caused devastation on the sea bed for marine life.

If you look at a map and you draw a line from Beachy head to selsea bill everywhere to the north of that line is classed as a nursery area where young fish come in to the shallow waters to spawn, as fishermen we are at sea fishing every day and we have noticed that the young fish are not coming in to spawn anymore. The bream, cuttlefish, Dover sole, Brill, turbot, cod are not laying their eggs in this area simply because of all the rocks that are constantly moving around. We have noticed that mussel beds are not forming limpits are not attracting themselves to rocks also weed and kelp is not growing because of all the movement and this In its self if devastating to marine life. I understand that it's law that a polluter must clean up after itself, maybe they should be made to somehow remove these rocks.

Rampion have all information and charts on where all of this spoil was dumped it was shown to us at one of many meetings so I guess they have this on record. Please look into this and this cannot be allowed to happen again in phase two of the windfarm."

3 Development Consent Order (DCO) and Deemed Marine Licences (DMLs)

3.1 Draft Development Consent Order

3.1.1 MMO has reviewed the draft DCO and provided detailed comments below and in Table 1. The MMO considers that both DMLs (Schedule 11 and 12) are very similar in structure and therefore we have based our comments on Schedule 11, but at this stage these are equally applicable to Schedule 12.

3.2 Unexploded Ordnance (UXO)

3.2.1 The MMO would like clarity on if the investigation of and the detonation of UXO's are included within the licenced activities. These are not part of any of the Works order or set out within the activities of Schedule 11 & 12, however a draft UXO marine mammal mitigation plan is proposed.

3.3 Article 5 Benefit of the Order

3.3.1 MMO requests the word 'including' to 'excluding' is changed in the following text:

“(2) Subject to sub-paragraph (4), 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 (including the deemed marine licences) and such related statutory rights as may be agreed between the undertaker and the transferee; and 12

(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) and such related statutory rights as may be so agreed, except where sub-paragraph (7) applies, in which case no consent of the Secretary of State is required.”

3.3.2 MMO requests the following sections are removed:

[...]

(5) 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.

[...]

(12) Section 72(7) and (8) of the 2009 Act (Variation, suspension, revocation, and transfer) do not apply to a transfer or grant of the benefit of the provisions of any of the deemed marine licences to another person by the undertaker pursuant to this article.”

3.3.3 Explanation for the text amendments

Article 5(2)(a) allows for the permanent transfer of the DML with the consent of the Secretary of State (SoS), with Article 5(2)(b) allowing for a temporary grant to a lessee for an agreed period. Here the consent of the SoS is not required. Although this is not made explicit this is possibly intended because the transfers are temporary and there is a desire to avoid unnecessary delays.

There is, however, no mechanism either in the DCO or the MCAA 2009 for a marine licence to be 'leased', because there are no provisions for the licence 'reverting' to

the licence holder after the agreed lease period and the MMO does not recognise that this would create a more streamlined system. Rather it simply operates to create an additional administrative procedure for marine licences (and one not envisaged by Parliament) and with no clarity in how it will operate.

The proposed drafting represents a clear departure from the MCAA 2009, which would normally require the licence holder (here “*the undertaker*”) to make an application to the MMO for a licence to be transferred. Instead, this provision operates to make the decision that of the undertaker, with the SoS providing consent to the transfer, rather than the MMO as the regulatory authority for marine licences considering the merits of any application for a transfer.

Article 5(5) is also of concern because there is no obligation for the SoS to take into account the views of the MMO when providing its consent. Furthermore, there is no obligation for the MMO to be informed of the decision of the SoS, notwithstanding its impact on the MMO as the licencing authority. From a regulatory perspective it is highly irregular that a decision to transfer a licence should not be the decision of the regulatory authority in that area (the MMO) but instead should be subject to such a cursory process as is set out in Article 5(1)-(3).

3.3.4 Powers already existing to transfer.

Article 5(12) explicitly disapplies sections 72(7) and (8) of the 2009 Act, which would otherwise govern these procedures. This conflicts with MMO’s stated position that the DML granted under a DCO should be regulated by the provisions of 2009 Act, and specifically by all provisions of section 72. Section 72(7)(a) 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 licence accordingly (s. 72(7)(b)). This power should be retained and used in relation to the DML granted under the DCO.

3.3.5 Inconsistencies with PINS guidance

The wording is inconsistent with the PINS Guidance on how DMLs should operate within a DCO. [Advice Note Eleven, Annex B – Marine Management Organisation | National Infrastructure Planning \(planninginspectorate.gov.uk\)](#) provides that where the undertaker choses to have a marine licence deemed by a DCO, the MMO, “*will seek to ensure wherever possible that any deemed licence is generally consistent with those issued independently by the MMO*”.

3.3.6 Inconsistent with intention of the DCO regime

Under the DCO legislative regime, it remains possible for developers (undertakers) to seek consent for a marine licence directly with the MMO (rather than having a DML integrated into the DCO). This flexibility underlines the fact that the DCO process simply integrates the existing mechanism for granting a marine licence. It should not therefore be used as a vehicle to alter or distort established process and procedures, such as those for the transfer of a marine licence.

3.3.7 Undermining enforcement capabilities of the MMO

Piecemeal changes to aspects of the marine licence regime by way of the DCO can undermine the ability to enforce the marine licence. Under the DCO, it remains the MMO who will be responsible for enforcing marine licences (both deemed or granted independently). It is therefore vital that all marine licences are clear and enforceable.

Consistency is a key element in achieving this, and this is best achieved by ensuring that the MMO has full responsibility for the marine licence process.

3.3.8 Purpose of Secretary of State written consent is unclear.

Not only is this an unnecessary (given that Parliament has already created a statutory regime for such a process), but it is also unclear what purpose the written consent of the SoS actually serves here.

For example:

If the intention is for the undertaker to be able to transfer the benefits under the terms of the DCO outside the established procedures under 2009 Act (which the MMO opposes), why is it considered necessary or appropriate for the SoS to 'approve' the transfer of the DML (even going so far as to include an obligation to consult the MMO)?;

It is also unclear what criteria the SoS would be taking in determining whether to approve any transfer, and how this would differ from a consent granted by MMO under the existing 2009 Act regime?

3.3.9 Practical concerns

It is unclear how the wording would work in practice. It would be necessary to vary the 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.

The transfer of the licence would happen first, and then the licence would need to be varied. After the transfer of the licence, the new licensee would have a marine licence which would still be in the name of the licensee who had transferred the licence. The new licensee would have no authorisation to carry out any acts until the variation had taken place and until the variation had been affected the old licence holder would remain liable for any actions undertaken.

Once again this creates additional confusion and administrative layers in lieu of relying on the existing legislative provisions. The procedure under s. 72 MCAA avoids this issue, which is an additional reason why it is preferred.

Because of this confusion and potential duplication, it is the position of the MMO that these provisions should be removed, and that any transfer should be subject to the existing regime under the 2009 Act, with the decision maker remaining the MMO.

3.4 Schedule 11 & 12 DMLs

3.4.1 Determination dates

The MMO strongly considers that it is inappropriate to put timeframes on complex technical decisions of this nature. The time it takes the MMO to make such determinations depends on the quality of the application made, and the complexity of the issues and the amount of consultation the MMO is required to undertake with other organisations to seek resolutions. The MMO's position remains that it is inappropriate to apply a strict timeframe to the approvals the MMO is required to give under the conditions of the DML given this would create disparity between licences issued under the DCO process and those issued directly by the MMO, as marine licences issued by the MMO are not subject to set determination periods.

Whilst the MMO acknowledges that the Applicant may wish to create some certainty around when it can expect the MMO to determine any applications for an approval required under the conditions of a licence, and whilst the MMO acknowledges that delays can be problematic for developers and that they can have financial implications, the MMO stresses that it does not delay determining whether to grant or refuse such approvals unnecessarily. The MMO makes these determinations in as timely manner as it is able to do so. The MMO's view is that it is for the developer to ensure that it applies for any such approval in sufficient time as to allow the MMO to properly determine whether to grant or refuse the approval application.

The MMO believes that if time scales are included within the DML for plans then these should be 6 months not 4 months. However, without prejudice to this position the MMO is open to discussions on which documents should be 6 months and which documents could be 4 months to take into account the concerns that the Applicant may have.

3.5 Additional Conditions

3.5.1 MMO has set out comments on the draft DCO/DML in Table 1 in addition to these the MMO requests the following conditions are added to the DML.

3.5.2 Reporting of impact pile driving

To comply with UK requirements on noise reporting the MMO requests this condition is added to both Schedule 11 and 12.

“25.— (1) Only when driven or part-driven pile foundations are proposed to be used as part of the foundation installation the undertaker must provide the following information to the Marine Noise Registry—

(a) prior to the commencement of each stage of construction of the licensed activities, information on the expected location, start and end dates of impact pile driving to satisfy the Marine Noise Registry's Forward Look requirements:

(b) at six month intervals following the commencement of pile driving, information on the locations and dates of impact pile driving to satisfy the Marine Noise Registry's Close Out requirements; and

(c) within 12 weeks of completion of impact pile driving, information on the locations and dates of impact pile driving to satisfy the Marine Noise Registry's Close Out requirements.

(2) The undertaker must notify the MMO in writing of the successful submission of Forward Look or Close Out data pursuant to paragraph (1) above within seven days of the submission.

(3) For the purpose of this condition, “Forward Look” and “Close Out” mean the requirements as set out in the UK Marine Noise Registry Information Document Version 1 (July 2015) as amended, updated, or superseded from time to time.”

3.5.3 Maintenance reporting

To ensure the MMO is able to know the maintenance activities throughout the lifetime of the operation including understanding any impacts the MMO requests this condition is added to both Schedule 11 and 12.

“26.—(1) An annual maintenance report must be submitted to the MMO in writing within one month following the first anniversary of the date of commencement of operations, and every year thereafter until the permanent cessation of operation.

(2) The report must provide a record of the licensed activities as set out in condition 3 during the preceding year, the timing of activities and methodologies used.

(3) Every fifth year, the undertaker must submit to the MMO in writing, within one month of that date, a consolidated maintenance report, which will—

(a) include a review of licensed activities undertaken during the preceding five years with reference to the reports submitted in accordance with condition XX(1) of this licence;

(b) reconfirm the applicability of the methodologies and frequencies of the licensable activities permitted by this licence for the remaining duration of this licence.”

3.5.4 Stages of construction

To ensure the MMO has the full timetable for construction the MMO requests this condition is added to both Schedule 11 and 12.

“27.—(1) The licenced activities must not be commenced until a written scheme setting out the stages of construction of the authorised development seaward of MHWS has been submitted to and approved by the MMO in writing.

(2) The stages of construction referred to in sub-paragraph (1) will not permit the authorised development to be constructed in more than one overall phase.

(3) The scheme must be implemented as approved.

(4) The written scheme referred to in sub-paragraph (1) must be submitted to the MMO in writing six months prior to the planned commencement of the licenced activities.”

3.5.5 Mitigation – seasonal restrictions

To ensure it is clear to all involved the MMO requests any seasonal restrictions for any activities are clearly conditioned as a stand-alone condition and not within an additional plan.

3.6 **Schedule 15 – Documents to be Certified**

3.6.1 To ensure clarity across all areas the MMO recommends this Schedule being split into 3 Parts:

Part 1 documents forming the environmental statement to be certified

Part 2 examination documents forming part of the environmental Statement to be certified

Part 3 other documents to be certified.

Table 1. MMO comments on draft DCO/DML		
Main DCO		MMO Comments
<u>Part 2</u>	Principal Powers	
	Article 5 Benefits of the Order	See section 3.3 above.

		In summary, any reference to the MMO and DML should be removed from article for transfer of the benefit of the DCO. This also relates to Part 1 (7) of the DML, which also needs removing.
	Article 5(8)“ <i>prior to any transfer or grant under this article taking effect the undertaker must give notice in writing to the Secretary of State, and if such transfer or grant relates to the exercise of powers in their area, to the MMO and/or to the relevant planning authority.</i> ”	MMO suggests removing reference to the MMO in the rest of article 5 because this transfer process should exclude the DML. However, there may be transfers which relate to the exercise of MMO’s power beyond the deeming of the marine licence. If this is the case, please consult with the MMO. If there are no such likely scenarios then reference to the MMO in the rest of article 5 should be excluded, so that there is no confusion that this might apply to the DML.
Part 4	Supplemental Powers	
	Article 20 Public rights of navigation	MMO requests clarity on the inclusion of this article. MMO notes that the public rights of navigation where any permanent structures are located within territorial waters will be extinguished and will take effect 14 days after the undertaker has submitted a plan to the SoS, Martine Coastguard Agency and the MMO. However, there are no powers under the DCO for the MMO to comment or refuse.
Schedule 1		
Authorised Project		
Part Requirements	3 Detailed offshore design parameters	
	5(4) “ <i>The number of cable crossings comprising Works No.2 must not exceed four unless otherwise agreed with the MMO</i> ”	MMO acknowledges the reference of MMO involvement and would like clarity on what situations would require agreement for further cable crossings. If cable crossings are identified would the associated cable protection be within the maximum permitted area and volume?
Part Requirements	3 Programme of works 10(1) No part of the authorised project within the Order limits landward of MLWS is to commence until a written programme identifying the stages of those works has been submitted to and approved by the relevant planning authorities.	MMO notes that this sets out the programme of works for onshore activities but also Works No. 6, it would be beneficial to be consulted on the programme for this work or this could be included within the Stages of Condition requested above.
Part Requirements	3 Onshore constructions method statement	MMO notes that we will be consulted on the onshore construction method statement

	23(1) <i>“No stage of the authorised project within the Order limits landward of MLWS is to commence until an onshore construction method statement for the construction method statement has been submitted to and approved in writing by the relevant planning authority in consultation with Natural England and to the extent that it relates to works seaward of the mean high water springs comprising Work No. 6, the MMO.”</i>	insofar as it relates to works seaward of the mean highwater springs (Works 6). MMO would like clarity on what the timescale for this consultation would be.
Schedule 11 – Deemed Marine Licence		MMO comments
Part 1		
	<i>“array cable” means ... Works No.1</i>	A space needs to be inserted here “Works No. 1”
	<i>“draft UXO marine mammal mitigation plan”</i>	MMO requests this is removed if UXO activities are not part of the licenced activities.
	<i>“draft piling marine mammal mitigation plan”</i>	MMO requests an outline plan being included part of a certified documents.
	2.(b) <i>“the disposal of up to 2,568,500m³”</i>	MMO recommends this is amended to m ³ .
	2.(b) <i>“the disposal [...] comprising the array area [...]”</i>	MMO notes that at present, this is an extremely broad disposal area. MMO acknowledges that it is common for offshore wind farms to ask to designate the whole area as a disposal site to allow them to clear the substrate for construction without needing to lift the material and transport to another disposal site. MMO welcomes the site characterisation report and has requested further information in Section 4.4 before the MMO is able to provide disposal site references.
	7. <i>“The provisions of section 72 (variation, suspension, revocation and transfer) of the 2009 act apply to this licence except that the provisions of section 72(7) and (8) relating to the transfer of the licence only apply to a transfer not falling within article 5 (benefit of the Order) of the Order.”</i>	This provision needs to be removed, along with the other sections of Article 5. See above section 3.3.
	8. <i>“With respect to any condition which requires the licensed activities to be carried out in accordance with</i>	MMO requests that the following is added: <i>“subsequent to the first approval of those plans, protocols or statements provided it has been demonstrated to the satisfaction of the</i>

	<i>the plans, protocols or statements approved under this licence, the approved details, plan or scheme are taken to include any amendments that may subsequently be approved in writing by the MMO.”</i>	<i>MMO that the subject matter of the relevant amendments do not give rise to any materially new or materially different environmental effects to those assessed in the environmental information.”</i>
	9. <i>“...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.”</i>	MMO requests that this is updated to state: <i>“...satisfaction of the MMO that the subject matter of the relevant amendments do not give rise to any materially new or materially different environmental effects to those assessed in the environmental information.”</i>
Part 2 Conditions		
Design parameters	Condition 2. – (2) <i>“Work No 2”</i>	MMO recommends this is changed to <i>“Work No. 2”</i>
	Condition 2(6) <i>“Any cable protection authorised under the licence must be deployed within 15 years from the date of the Order unless otherwise agreed with the MMO.”</i>	MMO would like to understand the reason for the inclusion of this condition. MMO notes this is for 15 years when the lifetime of a licence could be longer. Does this include cable protection within the maintenance phase? This should be clear within the DML.
Maintenance of the authorised project	Condition 3(1) <i>“MMP”</i>	This is a typo and should be corrected to MMO.
	Condition 3(1) <i>“Not more than 3 months following the completion of construction of the authorised project the undertaker must provide the MMP with an operations and maintenance plan.”</i>	MMO requests that this is updated to refer to the outline operation and maintenance plan <i>“in accordance with the outline...”</i> . This is to ensure all parties and consultees are clear what activities will take place within the Operation and Maintenance phase and ensure all required sections within the plan have been highlighted at this stage.
	Condition 3(5) <i>“Where the MMO’s approval is required under paragraph (3), approval may be given only where it has been demonstrated to the satisfaction of the MMO that the approval sought is unlikely to give rise to any materially new or materially different” environmental effects from those assessed in the environmental statement.”</i>	MMO requests that this is updated to state: <i>“...satisfaction of the MMO that the subject matter of the relevant amendments do not give rise to any materially new or materially different environmental effects to those assessed in the environmental information.”</i>
Extension of time periods	Condition 4(1) <i>“Any time period given in this licence given to either the undertaker or the MMO may be extended with the agreement of the other party.”</i>	All agreements must be in writing and this should be clear throughout the DML.

Notifications and inspections	Condition 5(6) <i>“The undertaker must inform the MMO Coastal Office in writing at least five days prior to the commencement of the licensed activities or any part of them and within five days of the completion of each licenced activity.”</i>	MMO requests that this is updated to <i>“at least 14 days prior to the commencement of the licensed activities or any part of them”</i>
Aids to navigation	Condition 6(1)	This is a very long single sentence and the MMO recommends breaking into two or three sentences to provide clarity of meaning.
	Condition 6(3)	Reference to 11(1)(o) is incorrect, MMO requests that this is please checked.
Chemicals, drilling and debris	Condition 9 <i>“(1) Unless otherwise agreed in writing by the MMO all chemicals used in the construction of the authorised project must be selected from the List of Notified Chemicals approved for use by the offshore oil and gas industry under the Offshore Chemicals Regulations 2002(a) (as amended).”</i>	MMO suggests that this condition is changed to the wording below, as the offshore chemical regulations 2002(a) (as amended) do not apply to chemicals used by the offshore wind industry, and the regulations only pertain to chemicals used in the oil and gas industry. <i>“Unless otherwise agreed in writing by the MMO all chemicals, paints and coatings used in the construction and operation and maintenance of the authorised project (not subject to other regulations) with a pathway to the marine environment must be approved by the MMO. Chemicals should be submitted to the MMO at least eight weeks prior to the use of the chemical, unless otherwise agreed in writing by the MMO.”</i> Please also see section 4.4.19 - 4.4.23 within the ES below for more information about notifications to the MMO.
	Condition 9(5)	Please update <i>“District Marine Office”</i> to <i>“Local Marine Office”</i> .
	Condition 9(8) <i>“All dropped objects must be reported to the MMO using the Dropped Object Procedure Form as soon as reasonably practicable and in any event within five days of the undertaker becoming aware of an incident. On receipt of the Dropped Object Procedure Form, the MMO may require relevant surveys to be carried out on the undertaker (such as side scan sonar) if reasonable to do and the MMO may require</i>	MMO requests this wording is amended to be in line with current consents: <i>“(1) The undertaker must report all dropped objects to the MMO using the dropped object procedure form as soon as reasonably practicable and in any event within 24 hours of becoming aware of an incident. (2) On receipt of the dropped Object Procedure Form, the MMO may require, acting reasonably, the undertaker to carry out relevant surveys. The undertaker must carry out surveys in accordance with the MMO’s reasonable requirements and must report the results of such surveys to the MMO. (3) On receipt of such survey results, the MMO may, acting reasonably, require the</i>

	<i>obstructions which are hazardous to other marine users to be removed from the seabed at the undertaker's expense if reasonable to do so."</i>	<i>undertaker to remove specific obstructions from the seabed. The undertaker must carry out removals of specific obstructions from the seabed in accordance with the MMO's reasonable requirements and at its own expense."</i>
Force majeure	Condition 10 <i>"(1) If, due to stress of weather or any other cause the master of a vessel determines that it is necessary to deposit the authorised deposits within or outside of the Order limits because the safety of human life or if the vessel is threatened, within 48 hours full details of the circumstances of the deposit must be notified to the MMO. (2) The unauthorised deposits must be removed at the expense of the undertaker unless written approval is obtained from the MMO."</i>	The MMO recommends this clause is taken out as it duplicates s.86 of MCAA and causes confusion. Although s.86 of MCAA does not include timescales for submission to the MMO of the undertaking of these actions. The defence under Section 86 of MCAA has two limbs, and in the event that the undertaker fails to notify the appropriate licensing authority, in this case the MMO, within a reasonable time of their actions (Section 86(2) "matters") the defence cannot be relied upon in the event of any enforcement action. If the applicant maintains that the proposed provision does not duplicate Section 86 MCAA and instead introduces a reporting requirement which did not previously exist, the MMO advises that it should be made clear that this provision is in addition to Section 86 and its requirements.
Pre-construction plans and documentation	Condition 12(1-3)	All reference of timescales must be six months not four months. Please see further comments in 3.4.1 above.
	Condition 12(3)	MMO requests the condition is updated to the following wording: <i>"(3) Unless otherwise agreed in writing with the undertaker, the MMO must use reasonable endeavours to determine an application for approval made under condition 11 as soon as practicable and in any event within a period of 6 months commencing on the date the application is received by the MMO."</i> Please see further comments in 3.4.1 above.
Offshore safety management	Condition 14	MMO is currently discussing this wording with the MCA to confirm the most recent agreed wording.
Reporting of engaged agents, contractors and vessels	Condition 15 <i>"15.—(1) The undertaker must provide the following information to the MMO— (a) the name and function of any agent or contractor appointed to engage in the licensed activities within seven days of appointment; and (b) each week during the construction of the authorised project a</i>	The following suggestions are for changes to improve clarity, but note also change to 24 hours' notice before carrying out activity, rather than a week after appointment. <i>"(1) The undertaker must provide the name, address and function of any agent, contractor or subcontractor that will carry out any licenced activity listed in this license on behalf of the undertaker to the MMO in writing no less than 24 hours before the agent, contractor or subcontractor carries out any</i>

	<p>completed Hydrographic Note H102 listing the vessels currently and to be used in relation to the licensed activities. (2) Any changes to the supplied details must be notified to the MMO in writing prior to the agent, contractor or vessel engaging in the licensed activities.”</p>	<p>licensed activity; and (2) Any changes to the name and function of the specified agent, contractor or subcontractor that will carry out the specified licenced activities must be notified to the MMO in writing prior to the agent, contractor or subcontractor carrying out the licensed activity. (3) The undertaker must ensure that a copy of this licence and any subsequent revisions or amendments has been provided to any agents, contractors or subcontractors that will carry out the licensed activity on behalf of the undertaker prior to them carrying out any licensed activity.”</p>
Pre-construction monitoring and surveys	Condition 16(1)(b) “Postconstruction”	This wording should be consistent throughout the condition.
	Condition 16	MMO may have further requirements during Examination.
Construction monitoring	Condition 17	<p>MMO requests that the following information is included within this condition: “(2) Subject to receipt from the undertaker of specific proposals pursuant to this condition the construction monitoring plan must include, in outline— (b) where piled foundations are to be employed, unless otherwise agreed by the MMO in writing, details of proposed monitoring of the noise generated by the installation of the first six piled foundations of each piled foundation type to be constructed collectively under this licence and the licence granted under Schedule 12 of the Order. (3) The results of the initial noise measurements monitored in accordance with sub-paragraph 17(2)(b) must be provided in writing to the MMO within six weeks of the installation (unless otherwise agreed in writing) of the first six piled foundations of each piled foundation type. 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</p>

		<p>further monitoring requirements have been agreed.</p> <p>(4) The undertaker must carry out the surveys specified within the construction monitoring plan or plans in accordance with that plan or plans, including any further noise monitoring required in writing by the MMO under condition 17(3), unless otherwise agreed in writing.”</p>
Timing of monitoring report	Condition 19	Update to include “agreed in writing”
Updating of cable monitoring plan	Condition 20 “or as instructed by the MMO.”	Update to “or as instructed in writing by the MMO.”
Piling	Condition 21(1) “Sensitive Features Mitigation Plan”	MMO recommends that this is not capitalised.
Piling	Condition 21	Please include the following condition: <i>“In the event that driven or part-driven pile foundations are proposed to be used, the hammer energy used to drive or part-drive monopile foundations must not exceed 4,400kJ and the hammer energy used to drive or part-drive pin pile foundations must not exceed 2,500kJ.</i>
Reporting of cable protection	Condition 22	Please change “Natural England” to “relevant Statutory Nature Conservation Body”.
Decommissioning	Condition 23 “(1) Prior to any decommissioning activities being undertaken the undertaker must submit and secure the written approval of the MMO for a decommissioning mammal protection protocol (Decommissioning MPP). (2) The Decommissioning MPP must be implemented as approved.”	MMO requests clarity on the inclusion of this condition and whether decommissioning activities are included and if so, this should be made clear in the licenced activities.
Completion of construction	Condition 24	MMO requests the following is included in this condition: “25. The undertaker must submit a close out report to the MCA and the UK Hydrographic Office within three months of the date of completion of construction. The close out report must confirm the date of completion of construction and must include the following— (a) the final number of installed wind turbine generators; (b) a plan of the layout of installed wind turbine generators and offshore accommodation platform; and (c) latitude and longitude coordinates of the centre point of the location of each wind turbine generator and offshore

		<i>accommodation platform, provided as Geographical Information System data referenced to WGS84 datum."</i>
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4 Environmental Statement (ES)

4.1 General Comments

4.1.1 MMO is aware that several major points raised during the Preliminary Environmental Information Report (PEIR) process have not been addressed sufficiently, and this poses a major issue. Please see points 4.6.6, 4.6.33, 4.6.35, 4.6.59 - 4.6.61, 4.7.9 and 4.7.10.

4.1.2 MMO has focused its review on the following chapters of Volume 2 of the ES, however, has also reviewed the accompanying figures in Volume 1, and relevant appendices where required:

- Explanatory Memorandum
- Rampion 2 ES Volume 1 Non-technical summary
- Chapter 1: Introduction.
- Chapter 4: The Proposed Development.
- Chapter 5: Approach to the EIA.
- Chapter 6 Coastal Processes.
- Chapter 8: Fish and shellfish ecology.
- Chapter 9: Benthic, Subtidal and Intertidal ecology.
- Chapter 10: Commercial fisheries.
- Chapter 26 Water environment.
- Chapter 30: Inter-related effects.
- Volume 4, Appendix 11.3 Underwater noise assessment technical report.
- Volume 4, Appendix 8.3 Underwater noise study for sea bream disturbance, Revision A.
- Rampion 2 Site Characterisation Report

4.1.3 The DCO Part 3.1 Schedule 1 Article 3 Part 1 authorised development Work No. 2, states that Rampion 2 must comprise no more than 90 wind turbine generators. Part 14 of the DCO 3(a) then states that

“Notwithstanding article 3(1) no more than 116 wind turbine generators and 1 offshore substation may be constructed. Also, in the ES Chapter 1 Introduction section 1.2.3 the overview of the proposed development suggests “up to 90 offshore wind turbine generators”.

However, in the Non-Technical Summary -Volume 1 of the ES the project is described as being made up of as 116 wind turbine generators, before Chapter 4 (4.1.13) states that up to 90 wind turbine generators will be a key element, before it states in 4.1.17 that the area and number of WTG have been reduced from 116 to 90. The DCO and ES and different chapters in the ES should contain the same specifications for consistency and to ensure impacts are accurately described mitigated and monitored appropriately.

4.2 Coastal Processes

MMO considers that all potential impacts have been identified. However, specific comments about the assessment of significance have been set out below

4.2.1 ES Volume 2 Chapter 4 – Table 4-3 – please advise if the WTG structure have sufficient bunding to contain the 29,819 litres of fluids?

- 4.2.2 ES Volume 2 Chapter 4 – Table 4-3 – to note details from this table should be provided in the Outline Scour Protection and Cable Protection Plan when completed.
- 4.2.3 ES Volume 2 Chapter 4 Table 4-5 – please provide evidence to show that the sand wave clearance of 10 metres (m) will be sufficient to create and maintain a corridor for the plough or trenching device.
- 4.2.4 ES Volume 2 Chapter 4 section 4.3.31 – plastic fronds can introduce plastics into the marine environment as they degrade over time. If there is scope to minimise the use of plastic fronds and geotextile bags, this would be welcomed and should be set out within the Outline Scour Protection and Cable Protection Plan.
- 4.2.5 ES Volume 2 Chapter 4 section 4.3.76 – the impacts of “ground-out” area has not been assessed especially in the near shore environment and should be included.
- 4.2.6 ES Volume 2 Chapter 4 Table 4-17 – it is not clear if a “jetter” include the use of Continuous Flow Devices (CFD). These are very powerful devices and can move considerable volumes of sediment which should be assessed.
- 4.2.7 ES Chapter 6 Coastal Processes (executive summary) –sand banks and the shoreline are “*sensitive receptors*” and any impacts on them need to be assessed.
- 4.2.8 ES Volume 4 Appendix 6.3 Coastal Process Technical report – section 2.1.2 – clarity is sought if any dredge pits (for sourcing of materials) or borrow pits are proposed?
- 4.2.9 ES Volume 4 Appendix 6.3 Coastal Process Technical report – section 2.4.4– what lessons from Rampion 1 disposals can be applied to Rampion 2 if drill-drive operations are used?
- 4.2.10 ES Volume 4 Appendix 6.3 Coastal Process Technical report – section 2.4.6 – the equivalence in drill volumes and mound volumes is surprising as the 0.6 ratio (Soulsby, 1997) would imply an expanded volume to grains/particles overlapping etc. this should be explained.
- 4.2.11 ES Volume 4 Appendix 6.3 Coastal Process Technical report – section 2.4.8 – MMO suggests that samples from Vibro corers etc are used to fully characterise the chalk substrate in order to validate the assumptions made in this ES (in terms of particle size, consolidate and settling velocity).
- 4.2.12 ES Volume 4 Appendix 6.3 Coastal Process Technical report – section 2.5.19 MMO hoped to see diagrams of the Suspended Sediment Concentration (SSC) plume showing the concentrations orientations and depositions so that pathways to receptors could be established, please can these be provided.
- 4.2.13 ES Volume 4 Appendix 6.3 Coastal Process Technical report – section 5.4.3 – no maps of the changes in terms of tidal currents due to the structures – either for Rampion 1 or cumulative with Rampion 2 (analogously to waves shown in Annex A of the document) have been included, MMO would expect to see this and would request these are added to the document.
- 4.2.14 ES Volume 4 Appendix 6.3 Coastal Process Technical report – section 5.4.3 – no maps for changes in sediment transport have been provided, please can these be provided for full review.
- 4.2.15 A number of embedded mitigation measures are presented in Table 9-16 and appear to be realisable. No additional specific licence conditions are required, however upon

review of the Scour Protection and Cable Protection Plan further information may be required within the Plan.

- 4.2.16 MMO notes that the outcomes of the ES report indicated that no significant coastal processes were predicted, and thus, no monitoring is formally required.
- 4.2.17 The quality of the data is high and informative in terms of Coastal processes. MMO requires further information above before being fully satisfied with the in relation to coastal processes.

4.3 Benthic Ecology

4.3.1 The baseline features of the region have been adequately characterised using a wide range of desk-based data sources (listed in Table 9-9) and, to augment this, both intertidal and subtidal targeted surveys have been conducted (listed in Table 9-10). These data sources have together been suitably used to characterise the benthic ecological baseline for the project which is appropriate.

4.3.2 Overall MMO considers all potential impacts to have been identified. However, below are some comments about the assessment of significance which require action.

4.3.3 In Section 9.6.3.1, regarding valuable ecological receptors (“VERs”) the report states *“only a very small proportion of marine habitats and species are afforded protection under the existing legislative or policy framework. Therefore, evaluation must also assess value according to the functional role of the habitat or species. For example, some features may not have a specific conservation value in themselves but may be functionally linked to a feature of high conservation value”*.

MMO fully supports this notion and was expecting to see references to a suite of species which are considered to have important functional presence such as key prey species for bottom feeding fish, key drivers of benthic-pelagic coupling and/or bioturbators which are likely to play an important role in the ability of the seabed to affect nutrient flux and/or carbon sequestration. However, in the relevant Table (Table 9-14) no such species are listed, only those of conservation interest are identified (which seems to contradict the statement given above in Section 9.6.3.1), the MMO requests that this is updated, or justification is provided as to why the prey species are not included.

4.3.4 While the report follows the Marine Evidence based Sensitivity Assessment (MarESA) approach regarding the sensitivity of receptors (biotopes in this respect) to potential pressures resulting from the project, which is of course acceptable, the MMO has reservations regarding the **“temporary increase in SSC and sediment deposition”**. In Table 9-22, a number of biotopes are listed to be **“not sensitive”** to heavy smothering with which the MMO is not in agreement with. For example, the biotope **“sponges and anemones on circalittoral rock”** is considered as not sensitive to heavy smothering 5-30 centimetre (cm) of sediment overburden. Given the sessility and feeding methods of these taxonomic groups (i.e., sponges and anemones), the MMO argues that they must be rather sensitive to this degree of sediment overburden, unless it can be demonstrated that this overburden for this project will be experienced for very short timeframes. If there is no supporting information that the sediment overburden for this (and other biotopes where sensitivity to heavy smothering is either **“low”** or **“not sensitive”**) then the sensitivity ranking should be reconsidered.

- 4.3.5 On a similar note, MMO has noticed that the report combines increased SSC with smothering into a single pressure. MMO considers that these two pressures, and importantly the mechanism by which they affect benthic organisms, are rather different and they should be separated out as part of an impact assessment.
- 4.3.6 Section 9.4.9 states “**All likely significant effects identified will be considered at further stages of the assessment as more detail regarding the design becomes available and greater levels of baseline data are collected and analysed. No matters aspects are being scoped out at this stage**”. MMO considers that this is a logical and precautionary approach at this time.
- 4.3.7 The Applicant has responded to comments raised during the Evidence Plan Process and PEIR regarding the use and reliance on predicted habitat maps (Table 9-6), by informing stakeholders that subsequently acquired site-specific survey data will be used and prioritised over predictive maps.
- 4.3.8 The outcomes of the ES report indicated that no significance benthic ecological impacts were predicted and, thus, no monitoring is formally required. However, in line with Natural England advice, the applicant has committed to undertake monitoring of habitats/species of principal importance pursuant to section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Thus, the proposed monitoring approach to Sabellaria spinulosa reef and chalk habitat is presented in Table 4.3 of the report cited in 3.3.1 above. MMO considers this approach to be sensible.
- 4.3.9 MMO would welcome monitoring of the sedimentary benthic communities throughout the construction and operation to provide valuable data to fill a large gap in current understanding. While such monitoring is not a formal request, the MMO would consider its inclusion here as a benefit to the whole.

4.4 Dredge, Disposal and Chemical Use

- 4.4.1 The survey for Rampion 2 offshore export cable corridor and array areas was extended to provide adequate coverage to be able to provide characterisation for benthic ecology. Samples collected and analysed as part of this survey were to support the determination of impacts on benthos and not specifically for sediment quality for dredge and disposal. MMO provided advice on the PEIR that suggested 30 samples should be taken across the areas. Considering the coarse nature of most of the construction areas, which were dominated by sand (some stony reef and bedrock were also identified), with finer sediments closer to the nearshore cross the export cable area as would be expected, the limited samples collected for analysis is likely to be indicative of the site overall.
- 4.4.2 ES Volume 4 Appendix 9.3 section 3.2 sampling strategy - MMO notes that the applicant states in that the final sample stations were signed off by the MMO across the subtidal survey area (Figure 1) based on the rationale outlined in Section 3.1 and presented in Figure 3. In total eight samples were collected across the ES assessment boundary area which were analysed for particle size analysis (PSA) heavy trace metals (including arsenic) and seven for Polyaromatic Hydrocarbons (PAHs), total organic carbon and total organic matter.
- 4.4.3 MMO notes that the samples were collected for chemical analysis using a 0.1 square metre (m²) Day grab which is appropriate, however it is preferable for the samples for PSA to be from the same grab operation as the chemical analysis procedure. In this

instance a mini-hamon grab sample was taken for separate PSA sample. PSA was analysed by Ocean Ecology who are an MMO-validated laboratory for this procedure.

- 4.4.4 ES Volume 4 Appendix 9.3 section 6.3.2 sampling strategy - If these sediments have been sieved to less than 63 microns and hydrofluoric acid used, the comparison to Centre for Environment, Fisheries and Aquaculture Science (Cefas) Action Levels in the text in Table 11 should be removed. However, depending on the methods used the comparison to Canadian threshold effects levels and OSPAR Background Assessment Concentrations (BAC) (OSPAR *et al.*2009) may conversely be inappropriate. Therefore, only where methods of extraction match those of the preparation of the metric it is being compared to (OSPAR BACS, Canadian TELS, US Environmental Protection levels, Cefas Action Levels, etc) can the results actually be assessed.
- 4.4.5 It is of note that for the south coast of the UK dredge higher levels of Arsenic are naturally observed in sediments (Cefas report E5403 indicates for normalised sediments less than 63 microns that the regional background level for the Eastern Channel for Arsenic is proposed to be around 23 milligrams per kilograms (mg/kg) with levels of reference concentrations of 30 mg/kg and proposed levels of Chromium for background around 90 mg/kg where the OSAPR BAC is 80 mg/kg). Therefore Table 11 OSPAR BAC has a typo for Chromium as none of the sites fail this should be 80 mg/kg (if methods are comparable). The methods of preparation and extraction should be clarified.
- 4.4.6 Provided the methods of preparation and extraction are comparable MMO believes the levels observed do not pose a concern for release of contaminants in suspended sediments during dredging/relocation/disposal activities and will confirm upon review of the clarifications.
- 4.4.7 ES Volume 4 Appendix 9.3, Table 12 - Results of samples analysed for PAHs were compared to OSPAR BACs Effects Range Lows (ERLs), International Sediment Quality Guidelines (ISQG), Threshold Effects Levels (TELs) and Probable Effects Levels (PELs), in the absence of agreed UK Action levels for PAHs. The levels of PAHs observed other than Phenanthrene and Pyrene at two stations were below the limit of detection.
- 4.4.8 Appendix 26.3 WFD compliance assessment (page 29) - It was noted that the Sussex coastal water body is currently failing with regards to mercury and its compounds, and Polybrominated diphenyl ether therefore it would have been preferable to see levels of these polybrominated flame retardants as well as metals and PAHs to provide confidence that the levels of contaminants likely to be released from the dredging and relocation is acceptable. However, given the coarseness of the material further offshore in the array area (sands and gravels) and the levels observed, the risk to the marine environment from the release of contamination appears to be low.
- 4.4.9 ES v2 chapter 9 Benthic, Subtidal and Intertidal Ecology – pathways for likely significant effects were identified on benthic subtidal and intertidal ecology receptors as a result of release of pollutants from the construction and decommissioning activities. This should be amended for the release of pollutants during construction, operation, maintenance, and decommissioning, to ensure that consideration of the impacts of the use and discharge of chemicals are adequately addressed. The release of accidental pollutants could also transpire during maintenance and

operation as well as for construction and decommissioning therefore this statement in the non-technical summary and chapter 9 should be amended.

- 4.4.10 MMO notes the estimated deposits on the seabed as a result of disposal for the initial mounds are said to be in the order of tens of hundreds of metres in diameter and from 10s to a few metres in thickness, with potential overlap of consecutive disposal events on the seabed. Fine grained material is not anticipated to settle locally with measurable thickness.
- 4.4.11 Chapter 9 Benthic Subtidal and Intertidal Ecology. Figure 9.2 shows the location of Benthic survey samples tested for contaminants. The MMO has found no other reference to sampling to determine the quality of the material to be displaced to be able to determine sediment quality from the chapters provided, this should be made clear.
- 4.4.12 Previous advice from the MMO during the PEIR consultation commented that there was an absence of sufficient physical and chemical detail for the proposed dredge and disposal area and therefore it was not possible to say whether disposal activity was acceptable. There is now some chemical and physical data available, which appears to indicate that the release of contamination from the construction activity is likely to be low, although the provenance for chemical analysis requires confirmation to be confident of the results provided to support this assessment.
- 4.4.13 Whilst coarse sediments may not be appropriate for chemical analysis over the likely disposal area (most likely across the array area) from the characterisation figures 9 and 10 (Appendix 9.2) the MMO recommends not disposing of chalk arising from the export cable area to the array area and relocation of material other than side casting for such sediments should be further justified to ensure that impacts on sensitive receptors is minimised. The MMO welcomes discussions on how this can be captured as part of the consent.
- 4.4.14 ES chapter 6 appendix Table2-6 -MMO has previously raised concerns that there was a lack of explanation as to how “drilling protocols” would limit the deposits of arisings over a thickness over 4-5m thick. The Applicant’s response was such that the sediment volume would be managed through either selective placement or redistribution of sediments after, as part of the construction method statement a foundation installation methodology including a dredging protocol, drilling methods and disposals of drill arisings and material extracted (C-279) (chapter 6). MMO is now content with these comments provided that these documents show adequate justification of how this limit will be achieved. MMO would welcome a draft drilling protocol at this stage or specific reference to these documents within the DML.
- 4.4.15 The installation of the cables will require ploughing, trenching or jetting or a combination of any such techniques. ES V1 section 3.2 states that some form of seabed preparation and the addition of any required cable protection may be required. The need for cable protection for inter-array and export cables may be site-specific and require different methods however this statement suggests that any protection will be used. This sentence could be better worded to show that the regulator will have the opportunity for considered approval of the options and locations to ensure that impacts on protected features is minimised using best available practice and techniques. The MMO notes this could be covered within the outline scour protection and cable protection plan.

- 4.4.16 Options for scour protection (Section 4.3.31 of the ES) included gabion baskets and nets, it should be noted that this will result in the potential introduction of plastic particles and cement to the marine environment, and MMO would support efforts to minimise where possible and recommend the type of protection to be used including impact from plastics is provided. Please see comments in Section 5.2 of this document of how this can be managed.
- 4.4.17 Please note, at decommissioning, where excavation of piles and or suction buckets is needed to be undertaken prior to cutting and or removal, an evaluation of the contamination and potential from release of chemicals from this activity will be recommended to be included as a licence condition (Chapter 4 4.9.7, 4.9.8 of the ES). This is to minimise the potential of the release of chemicals into the marine environment as a result of chemical use on the structures over the lifetime of the project. Once clarity is provided on decommissioning activities within the deemed marine licence the MMO may have further comments.
- 4.4.18 ES Volume 2 Section 3.2 Explanatory Memorandum states that two types of foundation are provided for the WTG, however this omits the use of suction buckets and therefore should be amended for consistency.

Chemical approval

- 4.4.19 Chapter 4 section 4.8.12 references touch up and full paint jobs for the WTG and Substation(s). MMO requires the volume and quantity as well as the frequency of use as well as how they are applied, and function to be fully described. Although chemicals used in 'closed systems' (within gears etc.) do not require notification to the regulator to support signatory obligations under OSPAR, where there is a requirement for top up of potential for release to the marine environment the quantities and characteristics of these chemicals should be included in the notification to the regulator for approval. Please see comments on this condition in Table 1.
- 4.4.20 Table 6-11 (*Chapter 6, Coastal Processes*) describes the potential for chemicals (bentonite) to be expelled or lost to the marine environment as part of the Horizontal Directional Dredging (HDD). An estimate of the risk to the marine environment should be provided to the MMO for any chemical used and discharged either intentionally or potentially accidentally as per OSPAR guidelines (2008-3) unless used within a closed system, on vessels, grey water etc. (e.g., falls within other regulations). Please refer to 4.4.21 for further information.
- 4.4.21 Table 4-4 (*Chapter 9, Benthic subtidal and intertidal ecology*) discusses the release of Bentonite as a non-toxic inert natural clay mineral on the list of notified chemicals for use and discharge into the marine environment. This statement is incorrect as this is not a list of 'approved' chemicals. This is a list of products where their contents have been hazard assessed and ranked using generic modelling parameters for oil and gas platforms that are not appropriate for use for offshore wind farms.
- 4.4.22 Risk assessment at a site-specific level is undertaken when operators apply to use and discharge these chemicals providing adequate environmental justification to their regulator. Whilst Bentonite is listed as posing little or no risk (PLONOR) into the marine environment, this chemical would still require notification and approval for use by the MMO on offshore wind farms depending on quantities frequency and location as a minimum. Other chemicals added like dyes, cement, additives etc. would also require individual notification.

4.4.23 The notification for approval should include methodological information including chemical type, methodology for its use, quantity, and frequency of use. A further “Chemical Risk Assessment” should be provided for any chemical with a “pathway to the marine environment”, this includes chemicals used in both open systems and closed systems where “top-up” is required. A Chemical Risk Assessment should include information on the toxicity, persistence, and biodegradability of the chemical (please note that further information may be requested following the review of this Assessment). For chemicals used in closed systems without the need for “top-up” only the methodology information is required. Following a review of the information and/or in consultation with Cefas, the MMO will make a decision on its use. This will be done through condition 9(1) and the MMO is currently reviewing this condition wording.

Site Characterisation Report

4.4.24 **Alternative use:** Consideration is given (section 3) for alternative use including beneficial placement and relocation, and no viable uses were thought possible which is understandable given the constraints regarding the nature of the material and potential uses available in the area at this time.

4.4.25 The potential use of seven open disposal sites included that of Rampion 1 is also provided (3.3). MMO acknowledge that none of the open sites were considered of use as they were designated with respect to the site-specific applications. The applicant should note that this is not always true, and once designated they may be of use to other applicants, provided adequate characterisation for the site is undertaken considering the proposed activity. However, given the volume and the location and nature of these works, MMO agrees that these sites would likely be unsuitable.

4.4.26 **Physical and Chemical Contamination:** MMO has been unable to find the name of the laboratory undertaking the analysis for trace heavy metals and PAHs in the reports and therefore have major concerns in the confidence of the levels indicated. The levels of hydrocarbons are said to be below the limit of detection (LOD), however the reported LOD value (1mg/kg) appears to be higher than would usually be expected from an MMO-validated laboratory. In addition, the table appears to state that all the determinands have an Action Level 1 (AL1) of 100 mg/kg, this is incorrect. This AL1 is for the total hydrocarbons analysis only (fluorescence method) and not individual determinands (MMO 2015).

Therefore, additional information is required regarding the methods of extraction for sample analysis to be appropriately compared to action levels cited.

4.4.27 Each of the four cables may require excavation at the punch outside (30m long x 4m wide x 2m deep) between 800 and 1,500m offshore at 2.5m LAT. These pits are anticipated to be in use for up to four months with the resulting volume excavated (720 metres cubed (m³)) potentially stored at the array (section 6.9.61) as well as material trenched from trenches or in the export cable area. If this material was to comprise chalk, they might cause mounds on the seabed. The impact of chalk rather than silt sand and gravel must also be considered as part of the discussion in the impact assessment, as chalk can have a toothpaste like consistency. This should be considered within the ES and the document should be updated.

4.5 Shellfish ecology

- 4.5.1 MMO considers the potential impacts on shellfisheries and shellfish receptors to have been accurately identified and no receptors have been scoped out. The appropriate evidence has been proposed for the assessments and the Applicant has made use of several relevant data sources. The MMO agrees that no species-specific surveys need to be conducted to characterise the baseline environment for shellfisheries and shellfish receptors.
- 4.5.2 Additionally, there is an adequate description of the potential cumulative and inter-related impacts and effect on the physical and biological environment in relation shellfish and shellfisheries receptors.
- 4.5.3 2.4.3 In table 8-7 Receptors requiring assessment for fish and shellfish ecology (Chapter 8, p50), cuttlefish (*Sepia officinalis*) is put under the mobile fish species. The MMO recommends including cuttlefish under shellfish rather than mobile fish species.

4.6 Fisheries and Fish Ecology

- 4.6.1 A number of comments and concerns raised by the MMO have not been addressed within the ES. Additionally, it appears that a number of concerns and recommendations made subsequently have not been taken forward by the Applicant. The MMO is very disappointed in this approach as further information and discussions will be required within the Examination period. The MMO notes that pre-application should be used to minimise the engagement within the Examination period and as the information requested has not been provided at this stage, this will cause more resource to be utilised during the short period of Examination. The MMO urges the Examining Authority to request the required information at the earliest opportunity to allow all evidence to be assessed and discussions to take place, to enable a robust decision to be made on fish ecology.
- 4.6.2 During the pre-application stage the MMO has raised major concerns regarding:
- the likelihood of significant impacts to black seabream during the construction, operation and maintenance;
 - the disturbance of black seabream from sedimentation and noise generated during export cable laying activities and the mitigation and surveys required;
 - to disturbance of black seabream from underwater noise (UWN) as a result of piling, concerns and uncertainty around the modelling behavioural effects; and
 - impacts to herring from UWN including modelling
- 4.6.3 Comments have been set out below, if anything requires further clarification the MMO recommends specific questions being asked as part of the Examination.
- 4.6.4 The MMO is still reviewing the cumulative impacts assessment and will provide further comments in due course.

Project description and study area

- 4.6.5 MMO notes a project description has been provided within Chapter 4 of the ES, a detailed description of each element of the marine works, and a construction programme has been provided for the construction phase of the works. In Table 8.12 of Chapter 8, the Applicant has presented the maximum design scenario (MDS) relating to each project phase activity and the potential impacts to fish associated with each activity have been identified. MMO is content the MDS presented is consistent with the parameters outlined in the project description.

4.6.6 There are discrepancies between the maximum duration of piling per day stated in the UWN Impact Assessment and throughout Chapter 8. In Chapter 8, the maximum duration to install a monopile is stated as 4 hours. However, in Appendix 11.3 (the Underwater Noise Impact Assessment), the worst-case duration for monopile and jacket foundation installation is stated as 4.5 hours. It is also noted in Section 3.3.8 that

“In a 24-hour period it is expected that either a maximum of two monopile foundations or four jacket foundations can be installed. This is included as part of the modelling assuming that the foundations are installed consecutively. This increases the overall upper limit of piling durations in a 24-hour period for monopile foundations to 9 hours and 5 hours 50 minutes for worst-case and most likely scenarios, respectively. For jacket foundations this is 18 hours and 11 hours 40 minutes for worst-case and most likely scenarios, respectively”.

This was also raised in advice provided during PEIR, and the MMO requests clarity as to why this has not been amended.

4.6.7 The Applicant has defined the fish and shellfish ecology study area as a 16km zone of influence encompassing the proposed DCO Order Limits, this has been determined from the full potential maximum sediment plume excursion distance during spring tides. The MMO considers this to be a very small study area in relation to the size and scale of the project, particularly when accounting for the mobility of fish receptors. The Rampion 2 study area is also small in comparison to other Offshore Wind Farm (OWF) projects of a similar scale, size and significance where the respective study areas have been defined as the surrounding wider region, rather than limited to the area influenced by the anticipated sediment plume excursion. The MMO notes that for impacts of UWN, the area of search has been increased to 100km, which is appropriate, given the greater area of effect of UWN.

4.6.8 The spawning and nursery grounds of multiple commercially important fish species, and species of significant conservation importance are detailed within Section 8.6 of Chapter 8, and figures indicating the presence of spawning and nursery grounds (as per Coull *et al.*, (1998) and Ellis *et al.*, (2012)) have also been provided in the volume of figures for Chapter 8. As far as the MMO can reasonably determine, these have been accurately reported. For ease of interpretation, given the volume of information provided, it would be useful to have a table presented alongside this text, which presents a list of species as per Ellis *et al.*, (2012), and indicates via tick boxes whether the spawning and/or nursery grounds of each species overlaps with the Fish and Shellfish Ecology Study Area.

Habitat Suitability Assessments general comments

4.6.9 The Applicant has completed a herring potential spawning habitat and Sandeel potential habitat suitability assessment. Site-specific sediment grab samples have been collected from within and around the array, with PSA of samples used to classify sediment composition as ‘preferred’, ‘marginal’ or ‘unsuitable’ for herring spawning and sandeel habitat, according to the methodologies described in Reach *et al.*, (2013) and Latto *et al.*, (2013) respectively.

4.6.10 Whilst this is appropriate, the Applicant has not followed the recommended MarineSpace (2013a) and (2013b) methodologies for herring and sandeel, respectively. These methods use a suite of data including PSA data, British Geological Survey (BGS) data, Regional Seabed Monitoring Plan (RSMP) data,

herring larval survey data (for herring assessments), as well as fishing fleet data and scientific publications, to determine potential herring spawning habitat and potential sandeel habitat. This data is methodically layered to generate a single 'heatmap' output. Simply put, areas of higher 'heat' are representative of areas with higher potential herring spawning habitat, or potential sandeel habitat, respectively. Areas of 'heat' are assigned a score based on confidence of the data. The MarineSpace methods were developed in consultation with Cefas and are considered appropriate for use for other offshore activities and have been widely used in EIAs for OWF.

- 4.6.11 The MMO requests that the Applicant revises their habitat suitability assessments by following the MarineSpace (2013a and 2013b) methods and provides 'heat' maps of herring potential spawning habitat, and sandeel potential habitat, for the fish ecology study area as an addendum to the ES.
- 4.6.12 Further to the above, both habitat suitability assessments presented within Volume 3, Chapter 8 (Fish and Shellfish Ecology Chapter Figures 8.9 and 8.10), use UK Sea Map 2021 seabed data to characterise seabed habitats inside the project boundary and across the wider study area. The UK Sea Map 2021 seabed data presents sediments classified as '*hard substrata, coarse substrate, sand, mixed sediment and undefined*' seabed types. These categories are far too broad and do not present the necessary resolution for identifying sediments which are preferentially selected by herring and sandeel.
- 4.6.13 In the methodologies of Reach *et al.*, (2013) and Latto *et al.*, (2013), habitat suitability is determined according to sediment type as classified according to the Folk Sediment classification units (Folk, 1954). For herring, 'preferred' potential spawning habitats are those classified as gravel and sandy gravel sediments, and 'marginal' potential spawning habitats are those classified as gravelly sand, as per Reach *et al.*, (2013). Potential sandeel habitats are classified similarly, into 'preferred' (gravelly sand, slightly gravelly sand and sand sediments) and 'marginal' (sandy gravel) habitats as per Latto *et al.*, (2013) based on Folk (1954). The broadscale UK Sea Map habitat data presented in Figures 8.9 and 8.10 do not align with the methodologies of Reach *et al.*, (2013) and Latto *et al.*, (2013) which makes the habitat suitability assessments presented difficult to interpret, with much of the nuance of determining areas of higher or lower suitability being lost.
- 4.6.14 The Applicant should redo their habitat suitability assessments following the methodologies of MarineSpace (2013a) and (2013b) for herring and sandeel respectively. Broadscale seabed sediment data should be sourced from either the BGS 1:250,000 scale seabed sediment maps, or EMODnet seabed sediment data, both of which are underpinned by the Folk Sediment classification scheme (Folk, 1954). Ideally, PSA samples overlain onto the broadscale sediment map should also be classified according to Folk, (1954) for increased compatibility with the broadscale sediment map.
- 4.6.15 In comparing the symbology of Figures 8.9 and 8.10 in Chapter 8 of the ES, it is not clear why the UK Sea Map data is presented differently in each figure. The legend indicates that the colours selected for the categories of substrate is the same for both plots, however in Figure 8.9 (sandeel), seabed habitats surrounding and to the south of the Rampion array are predominantly 'coarse substrates' (pink), whereas in Figure 8.10 (herring), the same area of seabed habitat is classified as 'hard substrata' (grey). The MMO recommends that the Applicant addresses this inconsistency.

Atlantic herring potential spawning habitat suitability assessment

- 4.6.16 Herring are reliant on specific seabed substrates in order to undertake spawning, and therefore do not have the ability to spawn successfully in unsuitable habitats when gravel is unavailable. In relation to their herring habitat suitability assessment, the Applicant concludes that “*whilst preferred habitat is illustrated in Figure 8.10, there is no evidence of herring spawning in the area*”. At present, this conclusion is not supported by the Applicant’s herring habitat suitability assessment (within Chapter 8).
- 4.6.17 Whilst the MMO recognises that the highest intensity herring spawning occurs over grounds located more towards the centre of the English Channel than the array (as shown in Figure 8.8), Figure 8.10 clearly indicates that sediments within and surrounding the Rampion array are a mixture of “prime, sub-prime and suitable” potential spawning habitat, and therefore have sufficient composition to support herring spawning. In addition to this, Figure 8.8 shows herring larval densities amalgamated into a ‘heat’ map for the years 2007 – 2020, the map indicates that herring larval abundance within and surrounding the Rampion 2 array falls between 0.1 – 2,500 larvae per m². Supplementary figures are presented in Appendix 8.1 Herring Annual Heatmaps, to illustrate the interannual variability in herring larval density across the Downs herring spawning grounds. These figures show a scale of larval abundance per m² from 0.1 – 750. Both figures represent an incredibly large range for the lowest larval abundances, and this does not seem to support the Applicant’s conclusion considering that 2,500, or 750, larvae per m² still represents a significant larval density, particularly at a more localised scale. In order to evidence their assertion that there is no evidence of herring spawning in the vicinity of the array, the Applicant should produce a heatmap following the methodology of MarineSpace (2013a), as outlined in points 4.6.10 and 4.6.11.

Short Snouted Seahorse

- 4.6.18 Short snouted seahorse has been appropriately identified as a sensitive feature of the Beachy Head East and West Marine Conservation Zone (MCZ) and of the Selsey Bill and the Hounds MCZ. Seahorses are generally slow moving and are categorised as having high hearing sensitivity according to the Popper *et al.*, (2014) criteria. Figures 8.22 and 8.23 indicate the likely range of impact from UWN from both sequential and simultaneous monopiling in relation to these MCZs, however it has been recognised by the Applicant that the species may spend periods of the year outside of MCZ site boundaries and potentially in the vicinity of Rampion 2. Within the In Principle Sensitive Features Mitigation Plan, the Applicant has recognised this and considered that there is potential for UWN from impact piling to propagate out towards the MCZs. The MMO welcomes this and defers to natural England as the Statutory Nature Conservation Body (SNCB) in relation to the MCZ assessment.

Black Seabream

- 4.6.19 Black seabream have been included in the assessment as a species of concern which is appropriate. The presence and density of nest sites have been characterised throughout Chapter 8, and the sources used appear to be largely appropriate for this purpose. Monitoring data from marine aggregate dredging sites (2002-2020) have also been included to indicate the location and relative density of black seabream nests across the years of data. Whilst nests appear to occur in the same approximate locations, within the Kingmere MCZ and within a discrete area of the export cable

corridor (ECC), each year, the Applicant should note there is usually some interannual variability in the density and position of nesting sites between years (Figures 8.14a and 14b). The Applicant has also noted a relative increase in nest density in data collected during surveys undertaken for marine aggregates Areas 453 and 488 from 2017 onwards.

- 4.6.20 MMO highlights the limitations of the aggregate monitoring data. To the best of our knowledge, to date, there have been inconsistencies in the timing of the post-June aggregate monitoring surveys. The 2017 surveys were undertaken on the 31 May and 7 & 25 August. Thereafter, the surveys undertaken in 2018, 2019 and 2020 were completed between May and July, thus making comparisons between the 2017 data and the July 2018-2020 data is not appropriate. This should be discussed within the documents.
- 4.6.21 The MMO notes in paragraph 8.9.267 in Chapter 8, that the assessment of behavioural effects of black seabream to UWN disturbance has been based on a threshold of 141 decibel (dB) re 1 micropascal (μPa) Sound Exposure Level, single strike (SELs) as defined by Kastelein *et al.*, (2017).
- 4.6.22 This goes against the advice from the MMO throughout the pre-application stage. In the Kastelein *et al.*, (2017) study, a 50% initial response threshold occurred at an SELs of 141 dB re 1 $\text{mPa}^2 \text{ s}$ for 44 centimetre (cm), captive-bred seabass. The study used piling playback and was conducted under laboratory conditions. However, under the same conditions, smaller seabass (31 cm) responded to a lower SELs than the large fish, with a 50% initial response threshold occurring at 131 dB re 1 $\text{mPa}^2 \text{ s}$. As black seabream attain reproductive maturity at 30cm it is more appropriate to draw comparisons to the smaller seabass in the Kastelein *et al.*, (2017) study. Furthermore, we do not consider a SELs of 141 dB re 1 $\text{mPa}^2 \text{ s}$ used for a 44cm captive seabass to be an appropriate or conservative threshold, as adult black seabream usually only attain a size of 35-40cm (Ruiz, 2008).
- 4.6.23 It should also be noted that, whilst seabass and black seabream have some physiological and anatomical similarity, seabass are broadcast spawners with pelagic eggs, so do not exhibit the same spawning, nesting and nest guarding behaviours. Given that the biological drivers and spawning behaviours in seabass are significantly different to those of black seabream, it is not possible to confidently infer whether wild black seabream will be affected in the same way that captive-bred seabass were in the Kastelein *et al.*, (2017) study.
- 4.6.24 The threshold of 135 dB SELs, as per Hawkins *et al.*, (2014), could be considered a precautionary approach to modelling. However, this is still making inferences from a proxy species, the 135 dB threshold was based on a study of wild sprats i.e., clupeids with greater hearing sensitivity than seabass and black seabream.
- 4.6.25 The MMO understands there was no agreement between MMO, Natural England (NE) and the Applicant on a noise threshold or proxy species for black seabream prior to submission of the Application. If the Applicant wants to pursue a noise threshold route the MMO would expect to see more noise modelling based on the 135 dB threshold. However, even if this is provided the MMO is unlikely to agree a threshold approach for black seabream.
- 4.6.26 Please note in relation to advice on black sea bream the roles of MMO and NE differ and there may be a difference between advice from Natural England, as they provide advice on black seabream as a feature of Kingmere MCZ in the context of the

conservation objectives, to ensure that the site fulfils its function and makes its due contribution to the Marine Protected Areas network, and advice from the MMO is on how the development might interact with fish species as a whole.

4.6.27 In addition, the MMO would expect that noise modelling based on the 135 dB threshold is carried out as a standard practice to determine potential effects upon herring and herring spawning, given the location of Rampion 2 within the Eastern Channel region of the Downs herring spawning grounds.

Impacts to fish ecology receptors

4.6.28 The Applicant has outlined the potential impacts to fish ecology receptors which may arise during each phase of project activity in relation to the MDS. These are summarised in Table 2.

Table 2: Impacts to fish ecology receptors			
Potential Impacts	Construction	Operational	Decommissioning
Mortality, injury, behavioural changes and auditory masking arising from noise and vibration	✓	X	✓
Direct habitat loss/ disturbance in relation to installation and removal of the export cable, and maintenance within the export cable corridor	✓	✓	✓
Direct habitat loss/ disturbance within the array	✓	✓	✓
Long-term loss of habitat and increased hard substrate and structural complexity due to the presence of turbine foundations, scour protection and cable protection	X	✓	X
Temporary and localised increases in suspended sediment concentrations (SSC) and smothering	✓	X	X
Direct and indirect seabed disturbances leading to the release of sediment contaminants	✓	X	X
Electromagnetic field (EMF) impacts arising from cables	X	✓	X

4.6.29 Temporary and localised increases in SSC and smothering should be scoped into all phases of the project as both planned and unplanned maintenance activities, including but not limited to the repair, replacement, or reburial of sections of inter array cable, are anticipated to be required routinely throughout the project lifecycle. Similarly, removal of infrastructure during the decommissioning stage will likely create disturbances to the seabed, thus suspending fine sediments. Therefore, there is potential for temporary and localised increases in SSC and smothering to affect fish receptors during the operation and decommissioning stages, as well as during construction.

4.6.30 Impacts from accidental pollution during the construction phase, underwater noise as a result of operational turbines and displacement of fishing pressure in relation to the array have been scoped out of further assessment. The MMO agrees this is appropriate.

Baseline Evidence

4.6.31 The characterisation of fisheries and fish ecology has largely been informed by desk-based resources and past fisheries survey data that were collected for the Rampion 1 development. A summary of evidence sources used to characterise the baseline

environment has been provided in Chapter 8 (Table 8.10). Several site-specific benthic and subtidal surveys within the Rampion 2 study area have been carried out and, whilst these are not fisheries specific surveys, the sediment grab samples acquired will help to inform the fish ecology impact assessment. The MMO is generally content that these sources are appropriate for this purpose (including the data used) are consistent with sources typically used to inform for other OWF applications and will provide suitable characterisation of the fish and habitats present in the eastern English Channel region.

- 4.6.32 Sources identified include a number of fish characterisation reports, technical surveys and environmental statement chapters from OWFs in the region (Rampion 1). The Applicant has also referenced a number of monitoring reports which specifically relate to black seabream and their nesting and spawning grounds. Whilst the MMO is content that these sources are generally appropriate for this purpose, we recommend the Applicant exercise a suitable degree of caution when reviewing, and making reference to these reports, particularly with regard to the age of the reports and underlying data, and the appropriateness of the survey methodologies used for species targeted. Caution should be shown in the reports and clarity is provided to show this.
- 4.6.33 A site-specific geophysical survey was undertaken ahead of the PEIR. This study was carried out between July and August 2020 across the offshore PEIR Assessment Boundary. The results of the survey have been used to supplement existing data on likely black seabream nesting locations in areas relevant to the Proposed Development, but outside of areas previously subject to targeted survey (Kingmere MCZ). In the ES, Geophysical Survey (part 6 of 7), Figure 3.18 outlines “*Biogenic structure – possible black bream nest aggregations*”, but caveats this by stating that “*ground truthing is required to confirm the presence of these nesting areas*”. In the MMO’s response to the PEIR consultation, it was requested that the relevant seabed images and maps from the geophysical survey report be compared to data from aggregate industry nest site monitoring to improve the level of confidence in the data as to the location and density of nests present. As it stands, the MMO does not believe that the geophysical survey increases confidence in the baseline characterisation for black seabream nesting locations.

Underwater Noise Conclusions

- 4.6.34 The Applicant has acknowledged that the installation of foundations within the Rampion 2 Array Area has the potential to lead to significant injury and/or disturbance to fish species due to underwater noise generated during pile driving. UWN modelling is based on worst-case scenarios of a 13.5m diameter monopile installed with a maximum hammer energy of 4,400kJ, and for a 4.5m diameter pin pile installed with maximum hammer energy of up to 2,500kJ. Tables 8.20 and 8.21 outline the likely impact ranges for mono- and pin-piling at the south location, carried out as a single piling scenario and sequential piling scenario. Likely impact ranges for mortality and potential mortal injury (207 Sound Exposure Level, cumulative (SELcum)), recoverable injury (203 SELcum), and temporary threshold shift (TTS) (186 SELcum) for stationary fish receptor, as per the pile driving threshold guidelines described by Popper *et al.* (2014) have been presented.
- 4.6.35 The MMO recommends the UWN contours for simultaneous mono-piling are included within the figures for Chapter 8. The Applicant has made repeated reference to the

“the simultaneous installation of single monopiles at the East and West modelling locations” throughout Chapter 8, and modelling presented in the UWN Impact Assessment include simultaneous piling scenarios. Simultaneous piling (of pin and monopiles) represents a significant source of UWN, and the UWN contours for the worst-case scenarios for a stationary fish receptor should be presented clearly in a discrete subsection within the fish ecology chapter. In addition, modelled noise contours should also be presented for the unweighted SELSS 135dB as per Hawkins et al. (2014), for simultaneous piling scenarios of pin and monopiles. There have been lengthy discussions, prior to submission of the environmental statement, in an effort to determine a suitable threshold for modelling the likely range of behavioural impact for fish, in particular for herring and black seabream. As set out in section 4.6.27 above the MMO has requested modelling for the 135dB as per Hawkins et al., (2014) as the most appropriate, and sufficiently precautionary, threshold for modelling behavioural responses in black seabream, noting the threshold approach has not been agreed.

Herring and Black Seabream UWN Conclusions

- 4.6.36 The MMO disagrees with the Applicant’s assessment of potential impacts to herring from UWN. The MMO notes from the Underwater Noise Impact Assessment that the Applicant has calculated that the range of effect of behavioural responses in herring, based on the recommended modelled threshold of 135dB (Hawkins et al., 2014) may occur as far as 67km from the source of piling. Figure 8.20 presents the SELss contours for sequential mono-piling in the four modelling locations of Rampion Array, with noise contours presented based on the unweighted SELSS 135dB as per Hawkins et al. (2014). This is appropriate, and Figure 8.20 indicates significant overlap with the Downs herring spawning ground, as indicated by IHLS larval abundance data.
- 4.6.37 However, the Applicant has concluded in paragraph 8.9.195 that, as the UWN contours do not directly overlap with the spawning grounds as indicated by the Coull et al. (1998) shapefile, the magnitude of a behavioural impact to spawning herring from UWN is considered to be negligible. Whilst the Coull et al. (1998) spawning maps are valuable for providing an indication of the location of herring spawning grounds based on historic data, it is more appropriate for the Applicant to draw their conclusions from overlap with areas of higher IHLS larval abundance as this is a more recent, direct measure of herring spawning intensity for this region. Further to this, Figures 8.18, 8.19 and 8.21, which present UWN for sequential pin-piling, sequential mono-piling, and simultaneous pin-piling, all indicate that the likely range of impact of TTS in fish is also anticipated to overlap the herring spawning grounds. Given the proximity of the Rampion Array to the active Downs herring spawning ground, the MMO has serious concerns as to the level of impact that piling within the Rampion Array will have on spawning herring unless suitable mitigation is implemented.
- 4.6.38 The MMO disagrees with the Applicant’s assessment of the potential impact to black seabream from UWN as being of *“minor adverse significance, which is Not Significant in EIA terms”*. As outlined in 4.6.21 - 4.6.24 above, black seabream exhibits highly specific spawning and nest guarding behaviour and as a result are a designated feature of conservation importance within the Kingmere MCZ, along with the geological seabed features and sediments which provide suitable spawning and nesting habitat within the MCZ. There has not been any conclusive agreement as to a threshold where an effect/no effect boundary can be determined for black

seabream. As a result, several thresholds have been proposed. The Applicant also asserts that “*black seabream spawning and nesting grounds are located outside the noise contours of piling within the Rampion 2 array area.*” This is in contradiction to UWN noise contours presented in Figure 8.18 – 8.21 which show clear overlap with both the Kingmere MCZ, and the nesting sites identified within the ECC. In addition, it can be inferred from Figure 8.20 that the impact range for behavioural responses in black seabream, based on the threshold of 135 dB, as per Hawkins *et al.*, (2014), will also cover the nesting sites which have been identified.

- 4.6.39 The MMO agrees with the Applicants recognition that the ECC is located in close proximity to the Kingmere MCZ where there are important chalk habitats and sediments for black seabream nesting, and that nests have been identified within the proposed ECC area of search. The Applicant has also noted that black seabream are sensitive to seabed disturbances and that cable trenching has the potential to directly damage nesting areas as well as undermine the integrity of the seabed for future nest building. With this in mind, black seabream have been noted as having ‘high’ sensitivity to direct disturbance resulting from the installation of the export cable, which the MMO supports.
- 4.6.40 The MMO has some concerns regarding construction activities causing damage and disturbance to black bream nesting habitat during their spawning and nesting season. There will be direct disturbance to seabed habitat resulting from the installation of the export cable during the four months of offshore export cable installation activity. However, the Applicant has categorised the magnitude of this impact as negligible, based on the implementation of embedded mitigation (measures C-269 – 273 in Annex 1). Whilst the MMO is supportive of measures to minimise disturbance caused through trenching activities, and associated increases in SSC, the MMO believes it is premature to determine the magnitude of the impact as ‘negligible’ given these measures need some further refinement. For example, measures C-269 (micro-siting of the cable route) and C-270 (separation buffer between cable laying activities and sensitive features) may need further refining before the export cable route is finalised. The MMO is supportive of the Applicant’s assertion that cable installation activities within the ECC area are to be undertaken outside of the identified black seabream spawning and nesting season (point 4.6.49).

Mitigation

- 4.6.41 The Applicant has outlined a number of proposed environmental measures under table 8.13 in Chapter 8, which are intended to minimise significant disturbance to sensitive receptors (identified principally as black seabream, herring and seahorse). These are outlined in Annex 2. It is noted that the Applicant has asserted that these measures will be secured either through inclusion in the DCO requirements, or through conditioning onto the DML. The MMO is supportive of the Applicant implementing targeted mitigation however, the MMO considers that some of these measures need further refinement, to be agreed and secured through focussed and targeted consultations in which the relevant evidence can be carefully examined, and each issue can be adequately addressed.
- 4.6.42 Further detail of mitigation for sensitive features has been provided in the following documents and comments have been provided below:
- In Principle Sensitive Features Mitigation Plan: and

- Offshore In Principle Monitoring Plan

Mitigation measures for export cable installation within the offshore export cable corridor

- 4.6.43 Further to point 4.6.41, above, the Applicant has provided further details of the mitigation measures relating to the export cable. These are addressed individually below but are generally appropriate.
- 4.6.44 **Cable route design and micrositing:** Pre-construction surveys will be undertaken ahead of installation works and the results of these, along with the export cable specifications and installation equipment parameters, will inform the final routing/micro-siting of cables. A preliminary routing design exercise has been included within the In Principle Sensitive Features Mitigation Plan. The approach to micro-siting and refining offshore export cable corridor route, as outlined in paragraphs 5.2.8 – 5.2.9, is appropriate. Nonetheless, the Applicant asserts that the refined offshore export cable route will be based on the final project parameters and pre-construction data. At this stage, the MMO is content with this as a means of minimising the risk to black seabream nesting habitat.
- 4.6.45 **Developing appropriate buffer distances for sensitive receptors:** Avoidance by routing design reduces the potential for direct disturbance to black seabream from export cable installation works, however, the Applicant has indicated that they will utilise appropriate buffering between works and sensitive receptor locations to similarly reduce the potential for indirect impacts to arise. Buffering distances will be informed by the findings of the physical processes assessment, as set out within Chapter 6 of the ES. For gravelly sediments, a maximum average deposition thickness of 30 to 60cm, over an area up to 5 to 10m downstream of the trenching as the work proceeds along the length of the trench is predicted. For sandy sediments, the depositional area is greater, comprising a depositional depth range of 3- 6cm over an area up to 100 to 200m downstream of the active trenching location as installation proceeds along the length of the trench.
- 4.6.46 The Applicant has outlined that the target distance for laying cables will be set at around 250m inside the refined offshore export cable corridor, and that an additional 50m buffer will be implemented surrounding sensitive features (black seabream nests). This will provide for a separation distance between cable installation activity and the edge of any black bream nesting area of circa 300m. Notwithstanding the comment in point 4.6.61 - 4.6.62 below, at this stage, the MMO is content with this as a means of minimising the risk to black seabream nesting habitat.
- 4.6.47 At this stage, the MMO is content with the proposed separation buffer as this distance will reduce the likely volume of sand and gravelly sediments which may be deposited over nesting sites. The separation buffer may not offer the same protection in relation to finer sediments. Figure 5.1 (In Principle Sensitive Features Mitigation Plan) outlines an example output from a routing study showing bream nest areas and the separation distance. It would be helpful to have this figure presented in a higher resolution as the label is not entirely clear, and to have the distances in meters between the cable lay route and the nest areas indicated for completeness.
- 4.6.48 **Use of specialist cable laying and installation techniques:** The Applicant suggests two trenching solutions which may reduce the temporal and spatial area of impact during cable laying operations. As far as the MMO can reasonably determine,

these suggestions seem appropriate, and the MMO agrees that details of the specific equipment and methods should be presented for review in the Final Plan.

- 4.6.49 **Seasonal restriction for cable installation works:** The Applicant has stated that “*all cable installation activities within the offshore export cable corridor area are undertaken outside of the identified [black seabream] breeding season of March to July*”. The MMO is in support of this measure to minimise disturbance to individuals actively engaged in spawning and nest guarding, as there is potential for noise and vibration caused by machinery to disturb spawning and nesting individuals, and for increased suspended sediments arising from cable installation work to settle/smother nesting sites. The MMO would highlight that for the purpose of capturing this mitigation in the DML, the specific dates for the black seabream breeding season should be specified as follows 1 March to 31 July (inclusive) and be a stand-alone condition and not part of a mitigation plan for clarity during the activities.

Mitigation of noise generated by WTG foundation installation (relevant to black seabream and herring)

- 4.6.50 The Applicant has stated that the impact ranges for mortality or injurious effects resulting from impulsive UWN are predicted to be relatively localised, and not found to represent an impact at a population scale on any receptor. Mitigation measures relating to UWN are therefore focused on the lower noise levels likely to elicit TTS and behavioural responses in fish, particularly during sensitive periods. The noise mitigation plan has been designed on the principles that noise abatement will be in place for the entirety of the piling operations with additional measures put in place during the breeding season, assumptions on attenuation performance of the noise mitigation techniques are based on demonstrable performance of the technology, noise abatement is focused on reducing noise emission levels below the level at which a meaningful behavioural response might be expected to occur at the locations of sensitive receptors.
- 4.6.51 A series of mitigated piling scenarios have been presented using various noise abatement techniques in Figures 5.4 – 5.9. Some of these scenarios present multiple noise abatement techniques (low noise hammer technology and double bubble curtains (DBBC)) which appear to produce significant noise reductions (up to 25dB), however, the MMO notes from previous advice that the likely achievable noise reduction in dB will depend on the site conditions at Rampion 2. This should be taken into account and presented within the documents.
- 4.6.52 The UWN modelling upon which the UWN mitigation plan is based has used a received noise threshold of 141 dB in relation to black seabream. The MMO does not consider this to be sufficiently precautionary and has maintained that modelling should be done based on 135 dB SELss, as per Hawkins *et al.*, (2014), noting the threshold approach has not been agreed.
- 4.6.53 135 dB SELss, as per Hawkins *et al.*, (2014) is also relevant for modelling impact ranges for likely behavioural effect herring and should have been modelled in this mitigation plan. Additionally, the noise abatement options have not been modelled in the context of the Downs herring spawning ground, based on the Applicant’s conclusion that “*there is a low risk of any adverse effects arising even without mitigation as set out within Chapter 8: Fish and shellfish ecology*”. Please refer to points 4.6.38 - 4.6.39 as to why the MMO disagrees with this conclusion.

4.6.54 Based on the UWN contours presented in Figure 8.20 of Chapter 8 which present the 135 dB contour, UWN from piling undertaken at the Rampion 2 array, particularly from piling activities at the west and south modelling locations, will overlap the Downs herring spawning ground. Given that the UWN abatement scenarios in the mitigation plan have been presented based on a threshold of 141 dB, the range of behavioural impact for herring will likely be higher than has been presented. The Applicant should repeat the modelling exercise and present UWN modelling for the noise abatement reduction scenarios using a behavioural response threshold of 135 dB SELss. The MMO also requests to see the unmitigated UWN contours provided alongside each noise abatement scenario for comparison.

Piling restriction, March to June and July (black seabream):

4.6.55 In relation to mitigating the effects of UWN on black seabream, the Applicant has proposed a zoning plan for the periods of March to June, inclusive, which is then adjusted during July. The Applicant has outlined the following approach:

4.6.56 **During 1st March to 30th June:** The piling exclusion area will encompass the western part of the Array area, and no piling will therefore be undertaken in the western part of the Array (Figure 1, below). Piling in the eastern part of the Array area will be subject to mitigation using the combination of a low noise hammer technology and double bubble curtain (DBBC). Piling in eastern part will commence in the part of the array furthest from the Kingmere MCZ (in the southeast corner), and detailed scheduling of piling locations will be determined once the layout of WTGs and substations has been finalised.

4.6.57 **During July:** Piling may be undertaken in the western part of the Array. If piling is to be undertaken in the western part of the Array, installation will be still subject to a combination of a low noise hammer technology and DBBC. Piling in the western part of the array will be subject to a sequencing plan such that piling will commence at locations furthest from the Kingmere MCZ (in the southwest corner). Again, detailed scheduling of piling locations will be determined once the layout of WTGs and substations has been finalised.

4.6.58 **During 1st August through to 28th February:** The Applicant has stated that

“whilst there is no requirement for a spatial zoning plan for the remainder of the year, the Applicant will continue to mitigate piling noise. Therefore, for the purpose of this Plan, from 1st August through to 28th February during the construction period, the Applicant will propose to utilise at least one offshore piling noise mitigation technology”.

4.6.59 Zoning of piling works within the array needs further discussion along with the additional modelling requested. The MMO supports the Applicant’s assertion that noise abatement will be in place for the entirety of the piling operations. However, it is not clear why July has been treated separately within the Applicant’s proposed zoning plan. Black seabream are at their most sensitive when undertaking spawning and guarding their nests, and as a result, the conservation objectives of the Kingmere MCZ are of heightened importance during the spawning period. As we have clear evidence that black seabream continues to spawn and maintain their nests into and during July, we must consider that July is part of the spawning period. Therefore, it is necessary that any mitigation applied to Rampion 2 must include July.

- 4.6.60 During the previous Expert Topic Groups (ETGs), the Applicant indicated that they would not have sufficient reactivity during construction to undertake monitoring to determine the presence or absence of black seabream nests during July, and so would not be able to confidently determine whether the nests are abandoned or not. Given this context, we restate our position that any defined mitigation period must include the whole spawning period of March – July, inclusive. Acceptance of any zoning plan which permits piling to take place during the black seabream spawning and nesting season must be based on appropriate modelling and agreement with the SNCB.
- 4.6.61 MMO recommends a seasonal piling restriction during the black seabream spawning and nesting period of 1 March – 31 July (inclusive).
- 4.6.62 MMO also considers it necessary for a seasonal piling restriction to be implemented in order to prevent disturbance to spawning herring and their eggs and larvae at the Downs spawning ground during the spawning period of 1st November to 31st January (inclusive).

Monitoring

- 4.6.63 Pre- and post-construction surveys should be implemented to enhance the baseline data and to validate any predictions made in the ES on nesting habitat recoverability. These surveys should be suitably timed and use appropriate methods. Therefore, MMO recommends that a requirement for pre- and post-construction monitoring of black bream nesting habitat be included in the DML to ensure that the habitat recovers and continues to support black bream nesting, and that comparisons of nest location and density pre- and post-construction can be made. This should be clearly referred to within conditions 16-18.
- 4.6.64 MMO would welcome further engagement to develop suitable monitoring methods to ensure the data collected are robust and meaningful. This should be done as soon as possible to ensure the data is collected at the appropriate times and not delayed.
- 4.6.65 To summarise MMO has major concerns outstanding and considers further information is required on modelling along with further discussions on mitigation.

4.7 Underwater Noise

- 4.7.1 MMO considers that the appropriate receptors have been scoped in for assessment, and no activities or impacts relating to underwater noise have been scoped out of assessment for marine mammals. MMO defers to Natural England for comments on the Marine Mammal baseline.
- 4.7.2 Overall, the key potential impacts with regard to underwater noise have been accurately identified. MMO is largely of the opinion that the appropriate evidence base has generally been used throughout the assessment. However, aspects which the MMO does not agree with or believe requires further clarification are included below.
- 4.7.3 Following finalisation of the project design and pre-construction surveys, if construction activities are expected to cause significant disturbance or injury to a European Protected Species (EPS) (cetaceans), an EPS licence(s) will be applied for where applicable. MMO would encourage early engagement with the MMO conservation team.

- 4.7.4 MMO believes that the mitigation options are adequately captured within the relevant plans. Noting that a Construction Method Statement (as required under the DML) Condition 11 in Schedules 11 and 12 of the DCO) will be produced, post-consent, prior to construction which will include details of the procedures for soft start and ramp up of piling activity.
- 4.7.5 Further, two draft Marine Mammal Mitigation Protocols (MMMPs) have been submitted as part of the DCO Application: one for Unexploded Ordnance (UXO) Clearance and one for piling. The draft MMMPs detail the proposed environmental measures to reduce the risk of any physical or permanent auditory injury to marine mammals during all piling and any UXO operations. Specific comments on both MMMPs are provided in Section 5.4 - 5.5 of this document.
- 4.7.6 In addition to these MMMPs, an In Principle Sensitive Features Mitigation Plan has also been submitted as part of the DCO application. This plan sets out the approach for the Applicant to deliver the required environmental measures for the Project to ensure the avoidance of significant disturbance of black seabream in relation to the Kingmere MCZ site Conservation Objectives. Please see comments on this plan in Section 5.7.

Appendix 11.3 Underwater noise assessment technical report

- 4.7.7 MMO has several general observations and comments regarding Appendix 11.3 which have been included in Table 3.

Table 3	
Section / Table	MMO Comments
Appendix 11.3 Underwater noise assessment technical report	
Section 2.2 Analysis of environmental effects	<p>The general approach / methodology to the underwater noise modelling is largely appropriate, and effort has been undertaken to produce an informative report, along with details of the input parameters used in the modelling. The assessment refers to appropriate noise exposure criteria for marine receptors. The MMO agrees with the report that at the time of writing, Southall <i>et al.</i> (2019) and Popper <i>et al.</i> (2014) represent the most up-to-date and authoritative criteria for marine mammals and fish respectively.</p> <p>For the assessment of the cumulative sound exposure, a fleeing animal receptor has been assumed for marine mammals, with 'fleeing' speeds of 3.25 m/s for low-frequency cetaceans and 1.5 m/s for all other receptors. For fish receptors, both a fleeing and stationary animal model has been assumed. Please note that MMO is not aware of empirical evidence to support fleeing in fish, and therefore the predictions based on a <u>stationary receptor</u> will be the most appropriate/relevant.</p> <p>Fleeing assumptions can have a significant effect on the assessment outcomes. For example, as per Table 4-15 in the report, maximum TTS ranges of 41 km are predicted for a stationary (fish) receptor, whereas for a fleeing (fish) receptor, this range is reduced to 25 km.</p>
Table 2-10 Levels for a 50 % response was	Please note that the Hawkins <i>et al.</i> (2014) paper does not refer to unweighted peak sound pressure levels, so it is not clear where the thresholds of 173 dB re 1 µPa and 168 dB re 1 µPa unweighted peak have been derived from. MMO

<p><i>observed in fish from Hawkins et al. (2014)</i></p>	<p>recommends that these thresholds are removed from Table 2-10 to avoid confusion.</p>
<p>Modelling confidence (section 3.1)</p>	<p><i>“The current version of the INSPIRE model attempts to calculate an average fit to the measures noise levels at all ranges. 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.... “</i></p> <p>The MMO welcomes this clarification, and we acknowledge the drive for reducing unnecessary conservatism in modelling. It is noted that the current version of INSPIRE should produce more realistic predictions.</p> <p>Figure 3-1 presents a comparison between example measured impact piling data and modelled data using INSPIRE version 5.1. Importantly, this comparison is lacking context.</p> <ul style="list-style-type: none"> i. Firstly, MMO notes that the pile sizes used in this comparison are much smaller (i.e., 1.8 m, 9.5 m, 6.1 m and 6.0 m) than the proposed (up to) 13.5 m diameter monopiles for Rampion 2. It is not clear how INSPIRE scales up the smaller piles. Additionally, have other factors, such as the penetration depth and the water depth, been considered in the modelling of the source levels? ii. Secondly, the comparison should make clear the hammer energies used. Are they relevant for this application? iii. Furthermore, the comparisons presented in Figure 3-1 are for the peak sound pressure (SPL_{peak}) only, while for the vast majority of the predictions in this appendix, which are derived from cumulative sound exposure (SEL_{cum}) calculations, the relevant metric is the single strike Sound Exposure Level (SEL_{ss}), and not SPL_{peak}. iv. Transparency in the modelling of these parameters is crucial for determining the model predictions.
<p>Section 3.2 Modelling parameters</p>	<p>Modelling has been undertaken at four representative locations, covering the extents and various water depths at the Rampion 2 site. These locations are at the North West (NW), South (S), East (E), and West (W) of the site boundary. Cumulative effects have been considered with piling at the E and W locations.</p> <p>The report confirms that in a 24-hour period, it is expected that either a maximum of 2 monopile foundations or 4 jacket foundations can be installed. It is therefore appropriate that this is included as part of the modelling assuming that the foundations are installed consecutively.</p> <p>In addition, there is a possibility that piling may occur simultaneously at two separate locations. Simultaneous piling for the worst-case parameters has been modelled at the E and W locations covering the largest spread of source locations.</p>

	<p>Table 3-6 and 3-7 show the source levels estimated for this study. The worst-case monopile should be 13.5 m (and not 12 m as the table states) although the maximum hammer energy is correct at 4,400 kJ.</p>
<p>Section Modelling Results</p>	<p>4 Monopile foundations (worst-case assuming 2 monopiles):</p> <p>The largest ranges are predicted at the S modelling location (with the deeper water depths of 53.4 m). For marine mammals, the following maximum PTS (SELcum) injury ranges are predicted:</p> <ul style="list-style-type: none"> • 15 km for low frequency cetaceans (i.e., minke whale), • 7.4 km for very-high frequency cetaceans (i.e., harbour porpoise), and • < 100 m for phocid pinnipeds (i.e., seals). <p>TTS ranges of 46 km, 34 km and 16 km were predicted for LF Cetaceans, VHF cetaceans and phocids respectively.</p> <p>PTS SPLpeak ranges of <50 m, 680 m and 60 m were predicted for LF Cetaceans, VHF cetaceans and phocids respectively.</p> <p>For fish, a maximum range of 41 km (stationary receptor) was predicted for TTS using the Popper <i>et al.</i> (2014) criteria (for 2 sequentially installed piles), as well as potential mortal injury (7.4 km) and recoverable injury (12 km). Based on a (behavioural) threshold of 135 dB SELss from Hawkins <i>et al.</i> (2014), effects are predicted out to 67 km (for a single monopile).</p> <hr/> <p>Jacket pile foundations (worst-case of four sequential piles):</p> <p>The largest ranges are also predicted at the S modelling location. For marine mammals, the following maximum PTS (SELcum) injury ranges are predicted:</p> <ul style="list-style-type: none"> • 13 km for low frequency cetaceans (i.e., minke whale), • 5.9 km for very-high frequency cetaceans (i.e., harbour porpoise), and • < 100 m for phocid pinnipeds (i.e., seals). <p>TTS ranges of 43 km, 31 km and 15 km were predicted for LF Cetaceans, VHF cetaceans and phocids respectively.</p> <p>PTS SPLpeak ranges of <50 m, 560 m and <50 m were predicted for LF Cetaceans, VHF cetaceans and phocids respectively.</p> <p>For fish, a maximum range of 44 km (stationary receptor) was predicted for TTS using the Popper <i>et al.</i> (2014) criteria, as well as potential mortal injury (8.9 km) and recoverable injury (14 km). Based on a (behavioural) threshold of 135 dB SELss from Hawkins <i>et al.</i> (2014), effects are predicted out to 63 km (for a single jacket pile).</p> <hr/> <p>The report states that when comparing the impact ranges for a single pile installation and multiple sequential pile installations, the overall increases are negligible, as by the time the subsequent piles are installed, the fleeing receptor</p>

	is at such a distance from the source that the additional exposure is minimal. The largest increases seen for these scenarios are only a few hundred metres.
Section 4 Modelling Results <i>Section 4.3 Multiple location piling</i>	As noted above, additional modelling has been carried out to investigate the potential impacts of two piling installations occurring simultaneously at separated foundation locations. Using the monopile and jacket pile foundation piling scenarios, modelling has been carried out for simultaneous piling at both the E and W locations, representing a worst case spread of locations. Results are presented in section 4.3 of the report.
Section 5 Other Noise Sources; <i>Table 5-4 and Table 5-5</i>	For SELcum calculations, the assessment assumes that all sources will be operating for a worst-case <u>12 hours in any given 24-hour period</u> apart from vessel noise which is assumed to be present for 24 hours a day. MMO agrees that all sources considered in this section are considered non-impulsive or continuous. A fleeing marine mammal receptor has been considered, and small effect ranges (largely <100m, with a few exceptions ¹) have been predicted for other sources of noise (i.e., cable laying, suction dredging, trenching, rock placement and vessels). Small effect ranges (< 50 m) are predicted for fish receptors. ¹ For VHF cetaceans, the TTS range for rock placement is 1.0 km, 200 m for large vessels, and 200 m for suction dredging.
<i>Section 5.1 Noise making activities</i>	<i>“The calculation of underwater noise transmission loss for the non-impulsive sources is based on an empirical analysis of the noise measurements taken on transects around these sources by Subacoustech. The predictions use the following principle fitted to the measured data, where R is the range from the source, N is the transmission loss and α is the absorption loss:</i> <i>Received Level = Source level (SL) – N log₁₀ R – αR</i> <i>This equation suggests that the propagation loss is of the form Nlog₁₀R + alpha R, which is what we would normally expect to see; however, the examples in Table 5.2 show that the alpha coefficient is negative. For example, for trenching, the approximate transmission (or propagation) loss is 13 log₁₀ R – 0.0004R. This is somewhat unusual (although conservative); please could the Applicant provide further clarification?</i>
<i>Table 5-2</i>	Table 5-2 appropriately provides a summary of the estimated unweighted source levels and transmission losses for the different construction (continuous) noise sources considered. Figure 5-1 shows the 1/3 octave frequency bands used as a basis for the Southall et al. (2019) weightings used in the simple modelling. The MMO understands that propagation loss is a function of the environment. Please could the Applicant explain why the propagation loss varies quite significantly between the different sources, particularly when the source spectra (as per Fig. 5-1) are not that different?
<i>Table 5-6 Characteristics of measured operational</i>	A summary of sites where operational WTG measurements have previously been collected is provided in Table 5-6 (below for reference). As the report appropriately highlights, the turbine sizes for modelling at Rampion 2 are larger than those shown in Table 5-6, with turbines between 10 and 18 MW being considered.

<p><i>WTGs used as a basis for modelling</i></p>	<p>Rampion 2 is also situated in greater water depths. Available data on which to base a scaling factor is limited, thereby adding further uncertainties into the assessment of potential risk.</p> <table border="1" data-bbox="360 315 1332 741"> <thead> <tr> <th>Wind farm</th> <th>Lynn</th> <th>Inner Dowsing</th> <th>Gunfleet Sands 1 & 2</th> <th>Gunfleet Sands 3</th> </tr> </thead> <tbody> <tr> <td>Type of turbine used</td> <td>Siemens SWT-3.6-107</td> <td>Siemens SWT-3.6-107</td> <td>Siemens SWT-3.6-107</td> <td>Siemens SWT-6.0-120</td> </tr> <tr> <td>Number of turbines</td> <td>27</td> <td>27</td> <td>48</td> <td>2</td> </tr> <tr> <td>Power rating</td> <td>3.6 MW</td> <td>3.6 MW</td> <td>3.6 MW</td> <td>6 MW</td> </tr> <tr> <td>Rotor diameter</td> <td>107 m</td> <td>107 m</td> <td>107 m</td> <td>120 m</td> </tr> <tr> <td>Water depths</td> <td>6 to 8 m</td> <td>6 to 14 m</td> <td>0 to 15 m</td> <td>5 to 12 m</td> </tr> <tr> <td>Representative sediment type</td> <td>Sandy gravel / muddy sandy gravel</td> <td>Sandy gravel / muddy sandy gravel</td> <td>Sand / muddy sand / muddy sandy gravel</td> <td>Sand / muddy sand / muddy sandy gravel</td> </tr> <tr> <td>Turbine separation</td> <td>500 m</td> <td>500 m</td> <td>890 m</td> <td>435 m</td> </tr> </tbody> </table>	Wind farm	Lynn	Inner Dowsing	Gunfleet Sands 1 & 2	Gunfleet Sands 3	Type of turbine used	Siemens SWT-3.6-107	Siemens SWT-3.6-107	Siemens SWT-3.6-107	Siemens SWT-6.0-120	Number of turbines	27	27	48	2	Power rating	3.6 MW	3.6 MW	3.6 MW	6 MW	Rotor diameter	107 m	107 m	107 m	120 m	Water depths	6 to 8 m	6 to 14 m	0 to 15 m	5 to 12 m	Representative sediment type	Sandy gravel / muddy sandy gravel	Sandy gravel / muddy sandy gravel	Sand / muddy sand / muddy sandy gravel	Sand / muddy sand / muddy sandy gravel	Turbine separation	500 m	500 m	890 m	435 m
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Turbine separation	500 m	500 m	890 m	435 m																																					
<p>Section 5.2 Operational WTG noise</p>	<p>To predict operational WTG noise levels at Rampion 2, the extrapolated source level from the measured data at each of the sites has been taken and then a linear correction factor has been included to scale up the source levels (Figure 5-2). The report acknowledges that this fit is speculative, as available data is limited. The SELcum calculations have appropriately assumed that the operational WTG noise is present 24 hours a day. A stationary receptor has been considered. For all marine receptors, predicted effects are <100 m, with a couple of exceptions².</p> <p>² Predicted TTS range for LF cetacean is 150 m, and 440 m for VHF cetacean.</p>																																								
<p>Section 5.3 UXO clearance</p>	<p>The maximum equivalent charge weight for the potential UXO devices that could be present at Rampion 2 has been estimated as 525 kg. This has been modelled alongside a range of smaller charge weights of 25, 55, 120, and 240 kg.</p> <p>It is appropriate that the estimation of the noise source level for each charge weight has been carried out in accordance with the methodology of Soloway and Dahl (2014). It is noted that 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.</p> <p>The maximum PTS range (SPL_{peak}) calculated (based on the worst-case UXO) is 13 km for VHF cetaceans (SPL_{peak} criteria) (with a TTS range of 23 km). For fish, the maximum range is 810 m. MMO has conducted a spot check of the worst-case predictions which look reasonable (assuming the methodology from Soloway and Dahl and no attenuation correction).</p>																																								

Volume 4, Appendix 11.2: Marine mammal quantitative underwater noise impact assessment

4.7.8 MMO notes that some of the language and statements presented in this report are misleading and unsubstantiated. For example, section 2.6.10 of Appendix 11.2 states that “*modelling the SELcum impact ranges of PTS with a ‘fleeing animal’ model, as is typical in noise impact assessments, are subject to both above-mentioned*”

uncertainties and the result is a highly precautionary prediction of impact ranges. As a result of these and the uncertainties on animal movement, model parameters chosen, such as swim speed, are generally highly conservative and, when considered across multiple parameters, this precaution is compounded. Therefore, the resulting predictions are highly precautionary and very unlikely to be realised". The actual concept of fleeing is not precautionary, and as the report highlights, there are uncertainties associated with animal movements and model parameters. For example, to assume that an animal swims directly and consistently away from the source may not be a true reflection of what happens in reality. Therefore, the MMO does not agree that the resulting predictions are *"highly precautionary and very unlikely to be realised"*.

- 4.7.9 As raised during the PEIR consultation, the information presented in section 2.5.3 onwards (TTS Assessment) only demonstrates what is not known about the significance of TTS – there is no evidence presented to confirm that it isn't significant, only conjecture. One could equally argue that at lower received sound levels, animals are less likely to flee (see Figure 2-2 on page 24), and so proportionally more likely to induce TTS than this assessment suggests. The TTS/PTS assessment seems to consider only an animal fleeing directly away from the source, whereas Fig. 2-2 demonstrates that even at received SELs of 160 dB, around 10% of animals will not flee, so there are uncertainties which tend toward underestimation of risk here too.
- 4.7.10 In the ES, the sensitivity of all cetaceans to PTS-onset is assessed as Low. In the PEIR, all cetaceans were originally assessed as having a 'Medium' sensitivity to PTS. However, it was raised by MMO that the consultant had not demonstrated that PTS would have merely a medium risk, only that there is uncertainty about how significant PTS may be for individual animals. Until and unless empirical evidence can shed light on whether this opinion holds water, the precautionary principle will continue to apply. Thus, it is recommended that cetaceans should be assessed as having a high sensitivity to PTS.

Chapter 11, Marine Mammals

- 4.7.11 In paragraph 11.9.42, the results of the underwater noise modelling have been misinterpreted, and it is incorrect to state that *"to be at risk of auditory injury, an animal would have to stay within the immediate vicinity of the noise source for 24 hours. This is considered unrealistic and therefore, the risk of auditory injury to marine mammals from these activities is considered to be de minimis"*. The underwater noise assessment (presented in Appendix 11.3) concludes that for non-impulsive (or continuous) noise sources, any marine mammal would have to be less than 100 m from the continuous noise source at the start of the activity, in most cases, to acquire the necessary exposure to induce PTS as per Southall *et al.* (2019). This is because the noise assessment assumed a fleeing animal receptor. Furthermore, the noise assessment assumed that non-continuous sources were operating for a worst-case of 12 hours in any given 24-hour periods apart from vessel noise (which was assumed to be present for 24 hours). Thus, Chapter 11 should be corrected accordingly.

Volume 4, Appendix 8.3 Underwater noise study for sea bream disturbance, August 2023. Revision A.

- 4.7.12 The document states:

"No known audiogram is available for black seabream. However, red seabream (Pagrus major) is in the same family, Sparidae. An audiogram (using Auditory Evoked

Potential (AEP) and behavioural techniques) was measured by Kojima et al., (2010) for this species and provides the best available proxy. It is believed that this species would be in Group 3 of the hearing categories for fishes identified by Popper et al., (2014), fishes with swim bladders that are close, but not intimately connected, to the ear. These fishes are sensitive to both particle motion and sound pressure but will be less sensitive to noise than those in Group 4. No particle motion audiogram is available for either species”.

The MMO agrees with the likely category as per Popper et al. (2014) and, as there is no known audiogram available for black seabream (to our knowledge), it may be suitable to use the audiogram for red seabream as a proxy for black seabream in terms of hearing ability.

4.7.13 **Section 3 Ambient underwater noise at Kingmere MCZ:** it is important to note that the short term (15-day) continuous background noise survey can only provide a snapshot of ambient noise levels within the vicinity. Essentially, a short-term measure of the ambient noise should not be used as representative of the ambient noise at that location for any time other than the period of time during which the measurements were undertaken (Good Practice Guide for Underwater Noise Measurement, 2014). To comprehensively characterise the ambient noise levels in specific locations or regions, long-term measurements are required.

4.7.14 **Section 4 Soundscape at Kingmere MCZ:** MMO agrees that acoustic disturbance should only be considered for audible sound. At a minimum, an introduced noise must be

- (a) above the hearing threshold and
- (b) exceed the background noise.

Nonetheless, and with reference to the following statement in Section 4:

“The “loud vessel” is approximately only 25 dB above the seabream hearing threshold. This implies that as a result of the seabream sensitivity, the “loud vessel” would be audible to the fish but is unlikely to be perceived as “loud””.

4.7.15 MMO is unsure how this is relevant, especially as we are concerned primarily with piling noise (not vessel noise). Furthermore, whether or not a sound is perceived as “loud” does not necessarily indicate its potential for behavioural disturbance.

4.7.16 **Section 5 Impact of piling noise at Kingmere MCZ:** Figure 5 is missing the spectra for loud boat noise and piling at 7,800 m.

4.7.17 Figure 2 in Annex 3 (Figure 5 from the Applicants document) equates measurements made using two different metrics:

(1) the sound pressure level (SPLrms), for the seabream audiogram and “loud boat” noise; and

(2) the single-strike sound exposure level (SELss), used for the piling measurements. SELss is a measure of sound energy, not of sound pressure. This fact unfortunately invalidates the argument put forward by the Applicant:

“An additional frequency spectrum has been included on Figure 5 that adjusts the 7800 m pile strike down to an equivalent noise level of 141dB SELss. It can be seen that this is only slightly higher than the “loud boat” spectrum. Therefore, at

approximately 30 dB above the hearing threshold, it is anticipated that the risk of sustained disturbance is low. The calculated noise level for this would be worst case (maximum hammer energy)”.

Since an SELs of, e.g., 141 dB re 1 $\mu\text{Pa}^2\text{ s}$, may in fact include instantaneous sound pressure levels much greater than 141 dB re 1 μPa , hence exceeding the audiogram threshold. In other words, the piling noise levels are likely to exceed the seabream audiogram to a significantly greater extent than Figure 5 suggests.

- 4.7.18 While vessel noise is a continuous noise source, piling is impulsive, and so a direct comparison of their potential behavioural effects is invalid, since the temporal and pulsed characteristics of noise have a significant influence on behavioural effects, with pulsed and intermittent sound generally understood to have more severe effects.
- 4.7.19 For example, as highlighted by Neo et al. (2014), intermittent sounds, such as from pile driving, may have a stronger behavioural impact on fish than continuous sounds, such as from drilling, even though the latter may have higher total accumulated energy. In this study, Neo et al. investigated whether sounds with different temporal structure resulted in different behavioural changes in European seabass. All sound treatments elicited similar behavioural changes, including startle responses, increased swimming speed, increased group cohesion and bottom diving. However, with all other sound conditions being the same, intermittent exposure resulted in significantly slower behavioural recovery to pre-exposure levels compared to continuous exposure. MMO considers Figure 2 highlights that piling noise has greatest energy at frequencies which red seabream are most sensitive (between ~100 and 1000 Hz), emphasising the risk of impact to this species, and thereby potentially to black seabream.
- 4.7.20 Page 13 of the study presents the various mitigation options for consideration (i.e., IHC PULSE hammer, MENCK MNRU hammer, and double bubble curtains) and associated decibel (dB) reduction in source level for each option. Evidence (i.e., references) should be provided to support the dB reduction for each option, including with respect to frequency (see following comment).
- 4.7.21 The efficacy of a noise abatement system to reduce the risk of impact depends on the frequency range at which sound energy is reduced and on the target species, as each species is sensitive to a certain frequency range. More information should be presented, particularly since fish are typically more sensitive to sound at low frequencies, where the noise reduction from noise abatement systems tends to be smaller. (Note: for example, a 15-dB reduction is for broadband SELs, not certain frequency bands).

4.8 Chapter10 Commercial Fisheries

- 4.8.1 MMO defers to the National Federation of Fishermen's Organisations and Sussex Inshore Fisheries and Conservation Authorities, along with standalone representatives on matters of commercial fisheries. The MMO will continue to be part of the discussions relating to securing any mitigation, monitoring or other conditions required within the DMLs.

4.9 Chapter 12 Offshore and intertidal ornithology

4.9.1 MMO defers to Natural England as SNCB and supports any comments raised in relation to the Ornithology. The MMO will continue to be part of the discussions relating to securing any mitigation and monitoring or other conditions required within the DMLs.

4.10 Chapter 13 Shipping and Navigation

4.10.1 MMO defers to the Maritime and Coastguard Agency and Trinity House on matters of shipping and navigation and supports any comments raised. The MMO will continue to be part of the discussions relating to securing any mitigation, monitoring or other conditions required within the DMLs.

4.11 Chapter 14 Civil and Military Aviation

4.11.1 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.

4.12 Chapter 15 Seascape, Landscape and Visual Resources

4.12.1 MMO defers to Natural England as the SNCB, along with Historic England and the Local Planning Authorities on matters of Seascape, Landscape and Visual Resources 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.

4.13 Chapter 16 Marine Archaeology

4.13.1 MMO defers to the Historic England on matters of marine archaeology and supports any comments raised. The MMO will continue to be part of the discussions relating to securing any mitigation, monitoring or other conditions required within the DMLs.

5 Other Documents

5.1 Outline Project Environmental Management Plan

5.1.1 Section 1.4 states *“The Final PEMP will be formally reviewed at least three months prior to construction commencing.”*. MMO requests that this is updated in line with the submission date as part of the DML– for this document the MMO believes 6 months prior to construction is appropriate.

5.2 Outline Scour Protection and Cable Protection Plan

5.2.1 In relation to the type of protection – micro-plastics could occur from some of the suggested protection. Impacts should be assessed and the MMO recommends protection without plastic should not be used. Reference should be included in the plan. For example:

“In light of inadequate scientific evidence at the time of writing regarding the impacts of plastic frond mattressing, the MMO recommend that polypropylene frond mattresses are not used due to the potential for the release of microplastics directly into the benthic habitat and the lack of evidence to the contrary. Therefore, if at the detailed design stage, there is reliable evidence demonstrating that plastic fronding specifically has negative impacts on the environment that outweigh any potential positive impacts then the project would be required to remove plastic frond mattressing from the design.”

5.2.2 Section 3.4.3 highlights that where conditions are not suitable in shallow water to “ground out” the export cable installation vessel on the seabed, there may be a need to construct temporary sand/gravel beds. These sand/gravel beds are to be removed after, however there is no description of where this material will be sourced or disposed of, this should be clarified.

5.3 Outline Marine Written Schemes of Investigation

5.3.1 MMO defers to the Historic England on the Outline Marine Written Schemes of Investigation and supports any comments raised. The MMO will continue to be part of the discussions relating to any conditions within the DML.

5.4 Draft Piling Marine Mammal Mitigation Protocol

5.4.1 MMO has no major concerns with the draft piling MMMP at this stage – it is appropriate that the final MMMP will be updated once final project details are known, to take account of the most suitable mitigation measures available at the time of construction.

5.4.2 Table 4-1 sets out the relevant embedded environmental measures. The MMO welcomes the development of a Vessel Management Plan (C-51), pre-construction to minimise encounters with marine mammals.

5.4.3 MMO strongly welcomes commitment C-265 – that at least one offshore piling noise mitigation technology will be utilised to deliver underwater noise attenuation to reduce predicted impacts to sensitive receptors at relevant MCZ sites. The MMO agrees that although the commitment is specific to MCZs (which are not designated for marine mammal features) C-265 is relevant to marine mammals as the use of mitigation technologies will reduce the risk of potential impact, including auditory injury and would be welcomed for all piles.

5.4.4 relevance, paragraph 5.1.34 of the MMMP confirms that for cumulative Permanent Threshold Shift (PTS) ranges, additional noise abatement systems will have to be considered and will be required to mitigate for the impact ranges in the final piling MMMP. The MMMP also refers to the standard measures typically employed for offshore wind farm developments including a mitigation zone, marine mammal observers, passive acoustic monitoring, acoustic deterrent devices, and soft start procedures. This is welcomed by the MMO.

5.5 Draft Unexploded Ordnance Clearance Marine Mammal Mitigation Protocol

5.5.1 MMO has no major concerns regarding the piling MMMP with the draft UXO MMMP at this stage – it is appropriate that the final MMMP will be updated once more information is available on the sizes and locations of any UXO devices present and consideration of the most suitable mitigation measures available.

5.5.2 Please note that there is a mistake in Table 3-1 and the predicted SPL_{peak} PTS range for VHF cetaceans and the 525 kg charge weight is 13 km (and not 2.5 km).

5.5.3 MMO recommends the Applicant change “*underwear noise*” to “*underwater noise*” in Table 4-1 under C-275. MMO fully supports the use of low order methods to dispose of UXOs using the deflagration method, and welcome that where other less impactful methods exist at the point of applying for a Marine Licence, those alternative methods may be proposed instead, where evidence support their efficacy. MMO would highlight that low order methods should be used in the first instance and high order to only be used as a last resort.

5.5.4 The MMMP refers to the standard measures typically employed for UXO clearance operations including a mitigation zone, marine mammal observers, passive acoustic monitoring, acoustic deterrent devices and soft start procedures. It is appropriate that bubble curtains are proposed for high-order detonations, should high order not be avoidable.

5.6 Outline Offshore Operations and Maintenance Plan

5.6.1 Section 1.2 states “*The Final PEMP will be formally reviewed at least three months prior to construction commencing.*”. MMO requests that this is updated in line with the submission date as part of the DML– for this document the MMO believes 6 months prior to construction is appropriate.

5.6.2 The outline operations and maintenance plan (Appendix A) provides a list of operations and maintenance. Activities are colour-coded as to whether they are likely to need additional licence or consultation with the MMO or relevant Statutory Nature Conservation Bodies (SNCBs). Due to the need to ensure that the MMO meets the OSPAR guidelines with regard to notification of chemicals those activities that involve the need for additional or amendments of chemicals should have the notification status to the MMO changed to yes, like the following examples:

- Generator replacement painting, cleaning (including marine growth and guano), and repair.
- Scheduled general maintenance work, for example: oil replacement, mechanical works.
- Generator replacement painting, cleaning (including marine growth and guano), and repair.
- Painting and cleaning (including marine growth and guano).
- Grout and corrosion works.

5.6.3 Appendix A - New cable protection - it should be clear what new cable protection means.

5.6.4 Appendix A - Additional scour protection around foundations – could this also be classed as new scour protection? This should be expanded.

5.6.5 Table B-1 sets out the maximum assessment assumptions for operational and maintenance activities. Along with the maximum footprint of seabed disturbance, the total volume anticipated for disposal as a result of drilled arisings trenching burying and ground clearance should also be included in this table.

5.7 In Principle Sensitive Features Mitigation Plan

5.7.1 The Plan reflects the commitment from the Applicant to undertake required measures to reduce the potential for any significant disturbance on sensitive features of relevant MCZs, specifically the Kingmere MCZ, the Beach Head East and West MCZs and Selsey Bill and the Hounds MCZ, during breeding/nesting periods. The Plan sets out the necessary mitigation that will be secured through the DCO, whilst allowing scope for refinement of the precise mitigation measures to be adopted once the final design and construction methods for Rampion 2 have been confirmed. This will enable the most appropriate project-related measures to be confirmed, based on best knowledge, evidence, and proven technology available at the time of construction.

- 5.7.2 Of relevance, as noted in *Verfuss et al.* (2019), a reduction of sound energy in the lower frequency range reduces the impact on species groups with low frequency hearing, while a reduction of sound energy in the higher frequency range will be effective for species groups with high frequency hearing. Thus, some noise abatement systems are more effective for one species group than for another, depending on the frequency range at which noise energy will be reduced compared to the unmitigated noise.
- 5.7.3 MMO strongly recommends the Applicant commit to using noise abatement technologies which achieve the greatest amount of noise reduction.
- 5.7.4 Further comments can be found in Section 4.6 of this document.

Export Cable Installation

- 5.7.5 The MMO supports the seasonal restriction (among other commitments) to ensure Offshore Export Cable Corridor installation activities are undertaken outside the black seabream breeding period (March – July) to avoid any effects from installation works on black seabream nesting within or outside of the Kingmere MCZ (Commitment C-273).

Foundation Installation (Piling)

- 5.7.6 MMO believes that the applicant is essentially proposing that a zoned approach to mitigation within the array area from March – July inclusively is undertaken. The Applicant confirms that at least one offshore piling noise mitigation technology will be utilised to deliver underwater noise attenuation in order to reduce predicted impacts to sensitive receptors at relevant MCZ sites (C-265).
- 5.7.7 In developing the spatial zoning strategy, three main noise mitigation measures will be employed. These are:
- (i) General hammer noise mitigation;
 - (ii) Low noise installation hammers; and
 - (iii) (iii) Double Big Bubble Curtain (DBBC).
- 5.7.8 MMO agrees with the plan that any assumptions on attenuation performance of the noise mitigation techniques should be based on demonstrable performance of the technology. As noted above, MMO recommends the Applicant should commit to using noise abatement technologies which achieve the greatest amount of noise reduction.
- 5.7.9 The Plan states that *“Noise abatement is focused on reducing (received) noise levels at the locations of sensitive receptors (i.e., at relevant MCZs) below the level at which a meaningful behavioural response might be expected to occur, which could then result in a significant effect on the breeding population (of black seabream or seahorse) during the breeding/nesting season, subsequently impacting upon the conservation objectives for the MCZ”*. The current zoning plan is based on a disturbance threshold of 141 dB SELss. However, as highlighted by the Applicant, a ‘behavioural threshold’ has yet to be agreed between all parties.
- 5.7.10 Within the Plan, there is a section on ‘developing an appropriate disturbance threshold’ (sections 5.3.20 – 5.3.25). MMO has previously provided comments during the pre-application process. Please refer to points 4.6.42-4.6.63 above.

- 5.7.11 Given the uncertainties regarding behavioural responses and the zoning approach, MMO recommends a conservative approach be taken by the Applicant in relation to underwater noise and recommended noise abatement measures across the entire site rather than zoning.
- 5.7.12 For the current proposal it is the understanding of the MMO that *“noise abatement will be in place for the entirety of the piling operations with additional measures [as set out below] put in place during the breeding season”*.
- 5.7.13 Proposed Measures:
- No piling will occur in the piling exclusion zones during the seabream breeding period (March-July) which will be defined by the modelling in the Final Sensitive Features Mitigation Plan (C-280). However, it is our understanding that this exclusion zone will be extended (regardless) to the western part of the array (please see following point) for the majority of the black seabream breeding period (March to June).
- During March to June, the piling exclusion zone area will be extended to encompass the western part of the offshore Array. No piling will therefore be undertaken in the western part of the Array as shown in Figure 5-14 (Figure 3 of Annex 3). The MMO believes the proposal to extend the piling exclusion zone to the western part of the array is reasonable. Overall, we support the more generic zoning as per Figure 5-14, rather than the small arbitrary piling exclusion zone/s.
- Thus, piling will only be undertaken in the eastern part of the offshore Array area, and subject to mitigation using the combination of a low noise hammer technology and DBBC. Piling in the eastern area will commence in the part of the array furthest from the Kingmere MCZ; *i.e.*, in the south east corner, as illustrated in Figure 5-15 (Figure 4 of Annex 3). The detailed scheduling of piling locations will be determined once the layout of WTGs and substations has been finalised.
- 5.7.14 It is not clear what the dark shaded area is in Figure 5-14 – the OWF separation zone. Please could this be made clearer.
- 5.7.15 Whilst there is no requirement for a spatial zoning plan for the remainder of the year, MMO notes that the Applicant will continue to mitigate piling noise. The Applicant will propose to utilise at least one offshore piling noise mitigation technology. The MMO would reiterate that provided the Applicant commits to using noise abatement technologies which achieve the greatest amount of noise reduction, then we could support this proposal.
- 5.7.16 The overall approach to mitigation is somewhat reasonable, however a number of issues are still require further discussion. As set out in this Section and Section 4.6.42 - 4.6.63.

5.8 Offshore In Principle Monitoring Plan

- 5.8.1 Some comments on monitoring requirements have been outlined in section 4, specifically in relation to Section 4.6 (Fish and Shellfish Ecology) of the Plan and the conclusions of no moderate or major adverse residual effects for Fish from Rampion 2. MMO will continue discussions on monitoring throughout examination and expect changes to this document.
- 5.8.2 Please update the submission timeline to six months – due to the nature of the monitoring report 4 months is not enough time to be able to review, consult and resolve consultation issues for larger OWF such as Rampion 2. The MMO also

encourages pre-engagement at the earliest stages once consented to allow for all issues to be resolved.

- 5.8.3 Table 4-5 states “*Validate, within reason, predictions in Chapter 11: Marine mammals, Volume 2 of the ES*”. MMO requests that “within reason is removed”. The reason for monitoring is to ensure the impacts are within the predictions in the ES, MMO recommends the first four piles are the worst case scenario piles and that should be updated within this document.

5.9 Outline Fisheries Liaison and Coexistence Plan

- 5.9.1 A significant impact on UK potters during the construction phase of Rampion 2 has been identified. With the commitment to the development of a Fisheries Liaison and Coexistence Plan (FLCP) that will explore mitigation options including cooperation agreements and associated payments for the UK potting fleet, the impact magnitude is reduced to minor and the residual effect is of minor adverse significance, which is Not Significant in EIA terms.
- 5.9.2 The MMO welcomes and notes that a Fisheries Liaison Officer (FLO) will be appointed, alongside a Company and Offshore FLO and a Marine Coordinator for Rampion 2.
- 5.9.3 Advice should be sought via the FLO when the timetable of works is known so that the local industry can provide real-time advice.
- 5.9.4 MMO would note that MMO will not act as arbitrator in regard to compensation and will not be involved in discussions on the need for or amount compensation being issued. This needs to be made clear within the Outline Fisheries Liaison and Coexistence Plan.

5.10 Outline Diver Communication Plan

- 5.10.1 MMO defers to the UK Health and Safety Executive on matters of diving and supports any comments raised. The MMO will continue to be part of the discussions relating to securing any conditions required within the DMLs.

5.11 Report to Inform Appropriate Assessment

- 5.11.1 The MMO defers to and supports Natural England as SNCB regarding impacts to international designated sites and the Habitats Regulation Assessment (HRA) for the Project.
- 5.11.2 The MMO will keep a watching brief on these documents and would remind the Applicant that any mitigation secured through these assessments will need to be included within the conditions on the DML.

5.12 Habitats Regulations Assessment (Without Prejudice) Derogation Case

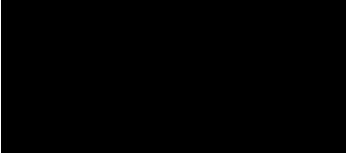
- 5.12.1 The MMO defers to and supports Natural England as SNCB regarding the derogation case proposed.
- 5.12.2 The MMO will keep a watching brief on these documents and would ask for any compensation requirements to be included within the DCO at this stage to ensure all parties have reviewed the wording, should the Secretary of State be minded to include compensation.

5.13 Draft Marine Conservation Zone Assessment

5.13.1 The MMO defers to and supports Natural England as SNCB regarding impacts to Marine Conservation Zones for the Project.

5.13.2 The MMO will keep a watching brief on this document and discussions in relation to MCZs and would remind the Applicant that any mitigation secured through these assessments will need to be included within the conditions on the DML.

Yours faithfully



Harriet Tyley
Marine Licensing Case Officer

D + [Redacted]

E [Redacted]

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7 Annexes

Annex 1: Relevant fish and shellfish ecology embedded environmental measures outlined in the Fish and Shellfish Ecology Chapter 8, Table 8.13.

Black Seabream – Disturbance from export cable installation

- **C-269:** Cable routing design will be developed to ensure micro-siting where possible to identify the shortest feasible path avoiding subtidal chalk and reef features and areas considered to potentially support black seabream nesting.
- **C-270:** As part of the routing design, a working separation distance (buffer) will be maintained wherever possible from sensitive features, notably black seabream nesting areas, as informed by the outputs of the physical processes assessment, to limit the potential for impacts to arise (direct or indirect).
- **C-271:** The offshore export cable routing design will target areas of the seabed that enable maximising the potential for cables to be buried, thus providing for seabed habitat recovery in sediment areas and reducing the need for secondary protection and consequently minimising any potential for longer-term residual effects.
- **C-272:** Adoption of specialist offshore export cable laying and installation techniques will minimise the direct and indirect (secondary) seabed disturbance footprint to reduce impacts, which will provide mitigation of impacts to all seabed habitats, but particularly chalk and reef areas as well as potential (unknown) black seabream nesting locations, where avoidance is not possible. The Applicant will seek to utilise the most appropriate technology available at the time of construction to reduce the direct footprint impact from cutting machinery.
- **C-273:** A seasonal restriction will be put in place to ensure offshore export cable corridor installation activities are undertaken outside the black seabream breeding period (March-July) to avoid any effects from installation works on black seabream nesting within or outside of the Kingmere MCZ.

Black Seabream – Disturbance from UWN

- **C-265:** At least one offshore piling noise mitigation technology will be utilised to deliver underwater noise attenuation in order to reduce predicted impacts to sensitive receptors at relevant Marine Conservation Zone (MCZ) sites and reduce the risk of significant residual effects on the designated features of these sites.
- **C-274:** Commitment to commence piling at locations furthest from the MCZ the Kingmere MCZ during the black seabream breeding period (March-July), to reduce effects from installation works on breeding black seabream within or outside of the Kingmere MCZ.
- **C-280:** Commitment that no piling will occur in the piling exclusion zones during the seabream breeding period (March-July) which will be defined by the modelling in the Final Sensitive Features Mitigation Plan.
- **C-281:** Commitment to no piling within the western part of the Rampion 2 offshore array closest to the Kingmere MCZ during the majority of the black seabream breeding period (March-June); and sequenced piling in the western part of the Offshore Array Area during July in accordance with the zoning plan to be set out in the Final Sensitive Features Mitigation Plan, to reduce the risk of significant effects from installation works on breeding black seabream within or outside of the Kingmere MCZ.

Annex 2: Indicative construction programme for Rampion 2, ES Chapter 4: The Proposed Development, Graphic 4-24.

	Year 1	Year 2	Year 3	Year 4	Year 5
Onshore Construction					
Onshore substation preliminary works (access road / site preparation)	█				
Onshore substation equipment manufacture	█	█			
Onshore substation construction and commissioning		█	█	█	
Horizontal Directional Drills (including landfall HDDs)	█	█			
Onshore cable manufacture	█				
Onshore cable route construction, commissioning and reinstatement		█	█	█	
Landfall tie-in and TJB construction			█		
Offshore Construction					
UXO and boulder clearance	█				
Offshore substation equipment manufacture and topside, and foundation fabrication	█	█			
Offshore substation installation and commissioning			█	█	
Offshore export cable manufacture	█	█			
Offshore export cable installation			█		
Wind turbine foundations fabrication	█	█			
Wind turbine foundations installation		█	█		
Array cable manufacture	█	█			
Array cable installation		█	█		
Wind turbine manufacture		█	█		
Wind turbine installation			█	█	
First Power			▼		
Wind turbine commissioning			█	█	
Commercial Operations Date (COD)					▼

Annex 3: Figures taken from the Applicants documents.

Figure 1: MCZs in relation to the Rampion 2 proposed DCO order limits taken from In Principle Sensitive Features Mitigation Plan.

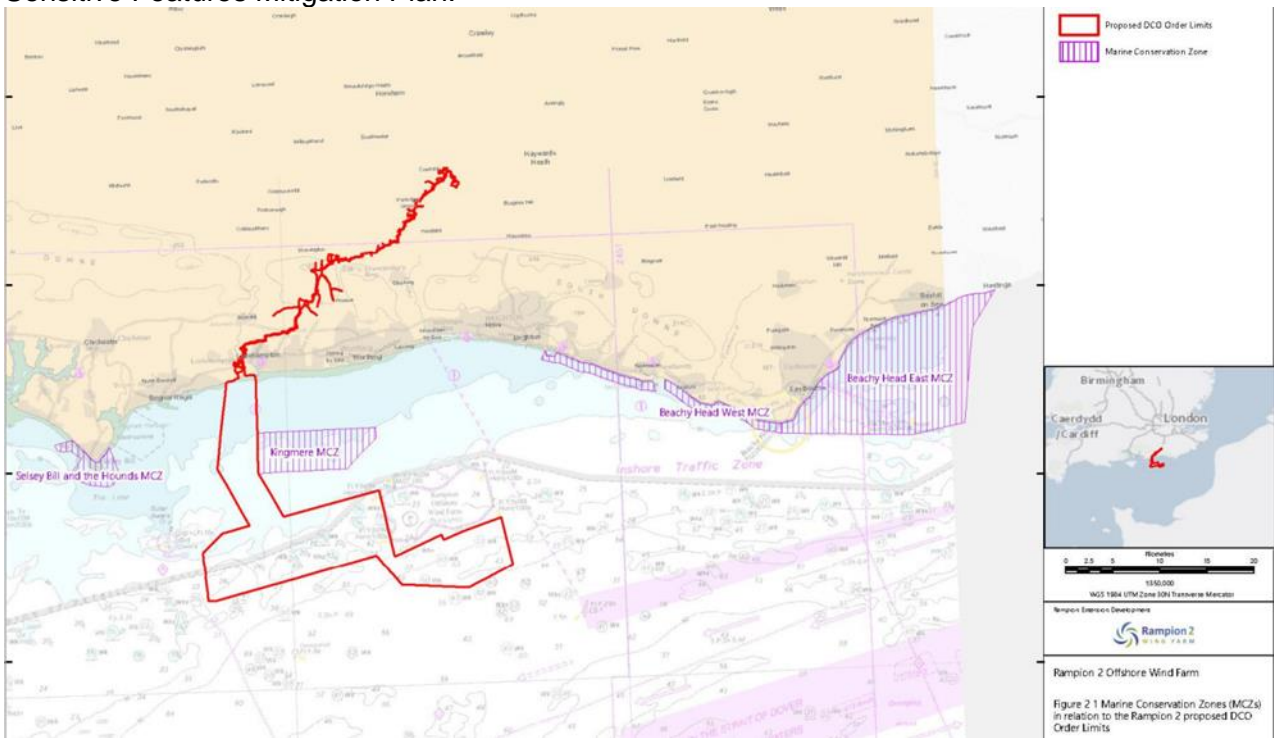


Figure 2: Kingmere MCZ “loud Boat” in relation to piling taken from Appendix 8.3 Underwater noise study for sea bream disturbance (below).

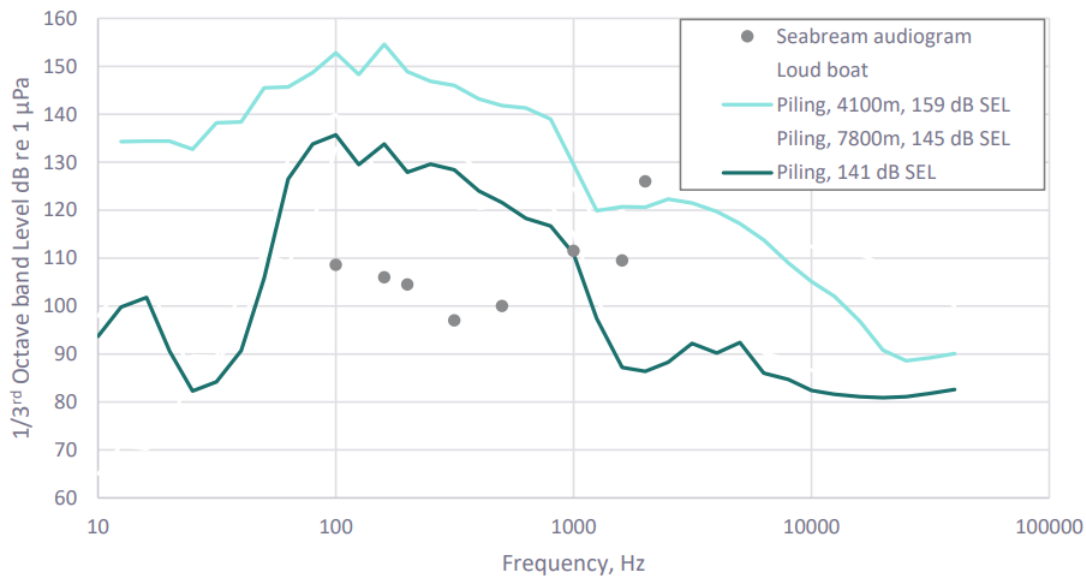


Figure 3 & 4: Proposed zoning methods taken from the In Principle Sensitive Features Mitigation Plan

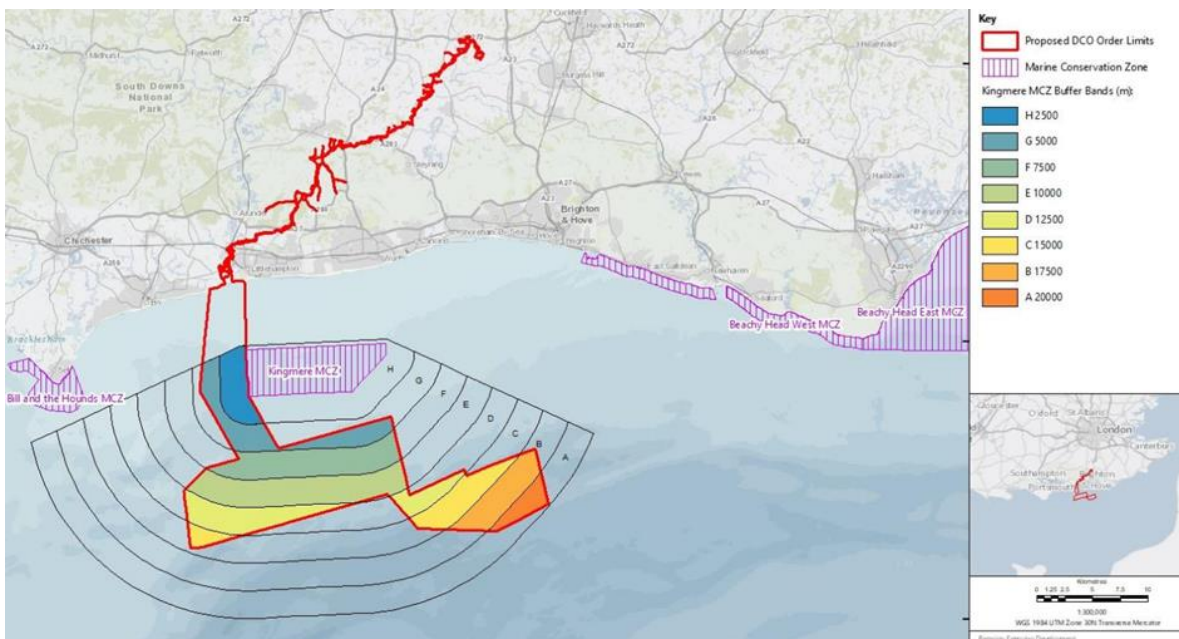
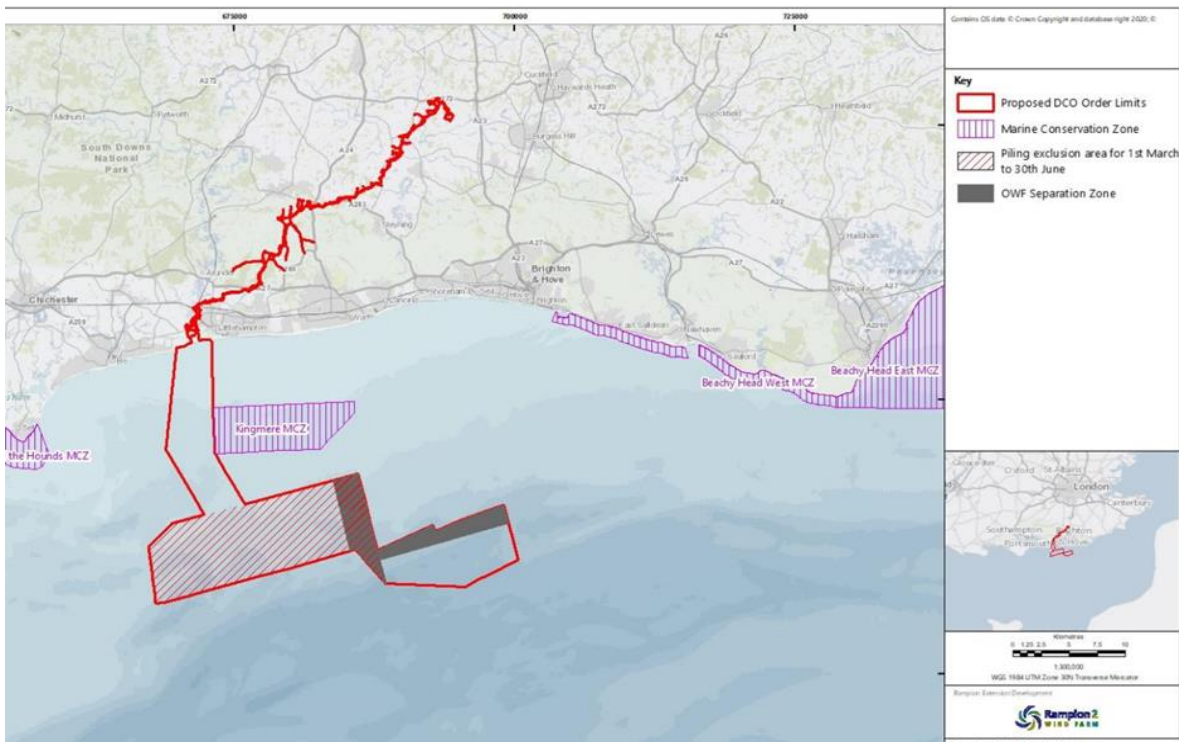


Figure 5-14 (top) and 5-15 (bottom) Taken from the In Principle Sensitive Features Mitigation Plan.