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To Whom It May Concern,

Planning Act 2008, Vattenfall Wind Power Limited, Proposed Thanet Extension Offshore Wind Farm

The MMO is an interested party for the examination of Development Consent Order (DCO) applications for Nationally Significant Infrastructure Projects (NSIPs) in the marine area. Should consent be granted for the project, the MMO will be responsible for monitoring, compliance and enforcement of Deemed Marine Licence (DML).

On 30 July 2018, the Marine Management Organisation (MMO) received notice under section 56 of the Planning Act 2008 (the "PA 2008") that the Planning Inspectorate ("PINS") had accepted an application made by Vattenfall Wind Power Limited (the "Applicant") for a development consent order (the "DCO Application") (MMO ref: DCO/2016/00003; PINS ref: EN010084), for the construction, operation and maintenance of the proposed Thanet Extension Offshore Wind Farm (TEOWF).

This document forms the MMO's deadline 6 submission, comprising:

- response to the ExA's Further Written Questions (ExQ3);
- comments on the ExA's dDCO commentary and
- comments on D5 submissions on the SEZ Material Change application

This written representation is submitted without prejudice to any future representation the MMO may make about the DCO Application throughout the examination process. This representation is also submitted without prejudice to any decision the MMO may make on any associated application for consent, permission, approval or any other type of authorisation submitted to the MMO either for the works in the marine area or for any other authorisation relevant to the proposed development.

Yours faithfully



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1. Response to the ExA's Further Written Questions (ExQ3)

1.1 Question 3.1.5 - Potential Construction Noise Effects on Fish

Question to: the MMO and the Applicant.

At Deadline 5, the Applicant provided additional material [REP5-003] to clarify its approach to assessing the construction noise effects on fish species. Table 8 of [REP5-049] indicates that considerable disagreement remains in respect of fish impacts and section 2 of the Marine Management Organisation's subsequent [REP5A-003] sets out a number of comments in relation to the potential construction noise effects on herring and sole spawning grounds. [cont.]

The response set out below addresses the following points requested by the ExA:

(d) For any areas in which disagreement remains, both parties should provide an evidence-based justification for their position.

(e) The MMO should provide a copy of the Marine Licence condition(s) that imposed a temporal piling restriction for the construction of the Thanet Offshore Wind Farm as referred to in para. 2.2.6 of [REP5A-003].

1.1.1 At present the MMO and the Applicant have not reached an agreement on these matters. The MMO presents justification and evidence for its current position as follows and outlines where there is current disagreement with the applicant.

1.2 Herring Spawning Grounds

Potential Impacts

1.2.1 Herring (and other clupeids) and their eggs and larvae are acoustically sensitive to noise and vibration and are therefore vulnerable to the impacts of construction activities such as piling and dredging. The effects of high levels of noise on fish can include biological, physiological and morphological impacts:

- Swim bladder rupture or tissue damage;
- Behavioural responses (avoidance of areas affected by increased noise);
- Physical injury;
- Auditory tissue damage (including temporary and permanent hearing loss);
- Physiological responses (stress, health and overall wellbeing) and
- Mortality

1.2.2 There are two herring spawning grounds in the vicinity of Thanet Extension OWF; one at Herne Bay for the Thames/Blackwater Herring sub-stock, and one in the Eastern Channel and Southern Bight for the Downs sub-stock. Downs herring spawn in the English Channel and Southern Bight between November and January. The Thames and Blackwater Estuary herring are a discrete population but are managed as part of the overall North Sea stock and do not have a separate total allowable catch (TAC). They are the only UK spring-spawning herring stock for which data is currently actively collected, spawning from late February to early May (Wood, 1981) in two sites; Herne

Bay, and the Blackwater estuary. The most recent assessment of this stock has found that it is below the biological reference limits, therefore the fishery remains closed. A sentinel fishery is in operation for monitoring purposes between September and 31st January. The sentinel fishery is a co-managed by scientists and fishermen working in collaboration.

Modelling

1.2.3 As stated at deadline 5a the MMO recommend that pile driving operations are not permitted during the herring spawning period, to minimise the risk of impact to spawning herring. To clarify, the proposed timings of this restriction are February to April (inclusive) for the Thames herring stock and 23rd November to 15th January (inclusive) for the Downs herring stock. The MMO would expect to see this reflected in the DML conditions.

1.2.4 This recommendation is following the applicant's revised modelling based on a stationary receptor submitted at deadline 4c ([REP4C-009](#) and [REP4C-010](#)). The modelling shows that the predicted impact ranges for mortality, recoverable injury and Temporary Threshold Shift (TTS) (207dB, 210 dB and 186 dB SELcum) will overlap with areas of higher importance for herring spawning (East Channel (Downs) stock). The 186 dB SELcum metric has the largest overlap with the spawning grounds.

1.2.5 In discussions, the applicant has suggested that the project in "a worst case assessment may impact on < 0.05% of herring spawning potential at the Downs stock, and 0% potential of the Thames/Herne Bay stock due to the Margate Sands sandbank sitting between the project and the spawning grounds and evidentially resulting in no interaction."

1.2.6 The MMO do not believe there is sufficient evidence to support the applicant's claim of such limited effect on spawning potential. Despite providing modelling for both a stationary and fleeing (herring) receptor the applicant is selectively drawing their conclusion based on the data presented for a fleeing receptor only.

1.2.7 Nonetheless, as highlighted in Table 1 of the applicant's own modelling ([REP4C-010](#)) the percentage of total spawning potential affected by piling for this proposed development alone is greater than 1% (namely 1.768%) in the case of a stationary (herring) receptor. This is clearly acknowledged in the same document, paragraph 11 states: "Table 1 describes that, with the exception of herring considered as a stationary receptor, the spawning potential affected is less than 1% for all receptors, with the exception of herring under the maximum worst case for all piling events combined".

1.2.8 Whilst the applicant maintains that drawing its own conclusions based on a fleeing model is "suitably precautionary", the MMO does not agree with this assertion.

1.2.9 The applicant cites the use of an assumed fleeing swimming speed of 1.5ms⁻¹ for fish as a receptor, noting that this was used for the assessment in Hirata K, (1999), however this is not empirical evidence proving that fish will flee from the source.

1.2.10 It is recognised that fish will respond to loud noise and vibration, through observed reactions including; schooling more closely, moving to the bottom of the water column, swimming away, and burying in substrate (Hawkins et al. 2014). However, this is not the same as fleeing, which would require a fish to flee directly away from the source over the distance shown in the modelling. The MMO is not aware of scientific or

empirical evidence to support the assumption that fish will flee in the manner suggested by the applicant.

1.2.11 In addition, whilst this swimming speed is not unrealistic, it is overly simplistic as it overlooks the various swimming capabilities and sizes of different species of fish, as well as biological drivers in fish such as migration, spawning and philopatric behaviour which may cause an animal to remain/return to the area of impact. This is of particular relevance to herring, as they are benthic spawners which spawn in a specific location due to substrate composition.

1.2.12 More importantly, the use of an assumed swimming speed is not appropriate when modelling the impact ranges to eggs and larvae which are a stationary receptor. Eggs and larvae have little to no mobility, which makes them vulnerable to barotrauma and developmental effects, hence the reason why they should be modelled as a stationary receptor.

1.2.13 As such, due to a lack of evidence to support fleeing in fish, the MMO believes modelling and the subsequent conclusions drawn should be based on a stationary receptor, because the use of a fleeing receptor is likely to under-predict the range of effect.

1.2.14 Furthermore the MMO has previously questioned the applicant's response to the ExA's Action Points arising from ISH3 ([REP3-002](#)). When discussing fleeing, they argue "...it should be noted that there is no academic evidence to suggest that an adult fish wouldn't move." The MMO would highlight that it is not suggesting, nor has it previously suggested that there is academic evidence to support this. On the contrary, the MMO has acknowledged that basing results on a stationary receptor is precautionary. In addition, the MMO questions the applicant's assertion that "*the impact of not moving is inconsequential*" in the absence of any evidence in support.

1.2.15 Further to this, the applicant's conclusions (which are largely based on the dubious assumption of a fleeing receptor) only consider piling operations at Thanet Extension. The applicant does not consider that the proposed activity would take place in the presence of other sources of noise which have the potential to cumulatively affect the spawning potential of herring, such as shipping.

1.2.16 The MMO acknowledge that basing results on a stationary receptor is precautionary, and recognise that fish will likely respond to a loud noise source. As noted, reactions have been observed such as schooling more closely or moving to the bottom of the water column, burying in substrate. Hawkins et al. (2014) for example, report changes in density of fish within a school, or a depth change in pelagic species in response to noise (percussive pile driving playback). Paxton et al. (2017) found that during seismic surveying, reef-fish abundance declined by 78% during evening hours. Furthermore, Slotte et al. (2004) found that the acoustic abundance of pelagic fish (herring, blue whiting and mesopelagic species) was higher outside than inside a seismic shooting area. Both blue whiting and mesopelagic species were found in deeper waters during periods with shooting compared to periods without shooting, indicating that vertical movement rather than horizontal movement could be a short-term reaction to this noise.

1.2.17 The applicant has questioned why fleeing was not originally raised as an issue during the PEIR review, although it was queried and discussed, which has been the case for a number of wind farms. At that time, it was requested that fleeing assumptions, primarily the fleeing distance (radius) and swim speed of the animal/s, were included in the Environmental Statements. However, following a significant

increase in the number of assessments suddenly adopting ‘fleeing’ for fish, the MMO and its technical advisers examined the evidence put forward by various developers (or rather lack of evidence) to support this assumption, and considered the current scientific literature. Thus, the MMO current position is that it cannot support the assumption of fleeing in fish due to the lack of direct scientific evidence provided by developers in their assessments.

1.2.18 The MMO would further add that this issue was raised in its relevant representations at Deadline 1 ([REP1-106](#)), and a significant period of Examination has been spent requesting that the revised modelling be undertaken rather than addressing the merits of that modelling.

Spawning Potential Calculations

1.2.19 In further justification for the piling restriction, the MMO highlighted at deadline 5a that: *“Whilst the MMO acknowledges that the IHLS data suggests that the primary spawning is further south, spawning grounds can vary / shift year on year.”* The applicant has questioned why the MMO does not accept the principles on which its calculations for spawning potential are based, insisting they are well established.

1.2.20 The MMO do not support the calculation of total spawning habitat because the use of spawning map data does not provide information on all the relevant factors that contribute to suitable conditions for fish spawning, and therefore the assumption that all of the area is suitable for herring/sole spawning cannot be entirely justified. The applicant defines the area of herring/sole spawning (which is based on total spawning grounds as presented in Coull et al., 1998 for herring and high intensity sole spawning grounds shown in Ellis et al, 2012). The MMO nonetheless acknowledges that the applicant has provided information on their specific methodology for how the total spawning habitat has been calculated.

1.2.21 For further clarification on this matter, the MMO add that herring do not display spawning bed site fidelity i.e. they do not return to the exact same location within a spawning ground to spawn. This lack of site fidelity is actually highlighted within the ORJIP report (2018) referenced by the applicant, which presents IHLS data for the Banks herring population between 2007/8 and 2016/17 and shows variability in the larval density both spatially and temporally. The HAWG (2014) report highlights that newly hatched larvae spatial distributions vary between areas and time periods. If herring utilised the whole of the Downs spawning ground every spawning season, this calculation would reflect the impacted area. However since herring do not spawn over the whole spawning ground each year, the calculation of percentage of spawning habitat is not truly reflective of the potential impacted area.

1.2.22 The MMO do not support the calculation of specific spawning areas because it is likely to over or under-represent spawning areas which may change over time. The applicant has delineated spawning areas using spawning map boundaries. While the MMO recognise that these provide the most recent and appropriate information to identify spawning areas, they do not fully consider the following:

- All potential areas of spawning;
- Any habituation that may occur i.e. identify areas where higher densities of spawning are present;

- Specific substrate requirements e.g. substrates which are more suitable within wider broadscale sediments;
- More suitable topography e.g. ridges/edges of sandbanks where sole may spawn or furrows where herring may spawn;
- Environmental factors that may influence spawning intensity such as temperature, oxygenation, natural disturbance, anthropogenic disturbance etc.
- Calculations of specific spawning areas are based on peak spawning times i.e. the number of days of a spawning period rather than considering the entire spawning season.

1.2.23 Consequently, with the above factors taken into consideration, the MMO cannot agree that a particular percentage of a spawning stock affected by noise impact thresholds in any one year is accurate. The salient point being that although the IHLS data suggests that the primary spawning has shifted further south, spawning grounds are known to vary/shift year on year. Thus, there is the potential for the primary spawning to shift further north, closer to the wind farm boundary in future (i.e. since there is no guarantee that the primary spawning will remain further south in subsequent years). Given the updated modelling (based on a stationary receptor) demonstrates overlap of the East Channel spawning grounds with the SELcum noise contours for injury and TTS, as a precautionary approach it is recommended that pile driving is not permitted during the herring spawning season.

1.2.24 The applicant maintains that their approach has been previously adopted for UK offshore wind farm projects including Walney Extension and Gwynt y Môr. Whilst the approach of calculating percentage of spawning habitat may have been adopted by Environmental Consultants who undertake Environmental Impact Assessments on behalf of developers, it was not supported by Cefas fisheries advisors as the assumptions on which calculations of spawning habitat are based are not considered wholly accurate for the reasons outlined above.

1.2.25 In support of their argument with regard to spawning potential and the metrics used for the underwater noise modelling, the applicant argues that both the MMO and its technical advisers Cefas support the topic-specific ORJIP (2018) study.

1.2.26 Whilst the MMO is aware that a member of staff from Cefas was on the advisory panel for the ORJIP report, Cefas fisheries environmental impact advisers have not provided any critical review of this report, nor are aware of any other colleagues who have provided a critical review.

1.2.27 According to the ORJIP report (2018) the aims and objectives were to:

- Review and consolidate available data and information to define (where possible) UK populations, key spawning areas and key spawning periods for herring;
- Identify any gaps in our understanding of herring populations, spawning areas and periods;
- Define and gain acceptance with consenting authorities and experts on herring populations, spawning areas and periods, where data is available; and
- Discuss and understand how the current mitigation approaches are agreed by consenting authorities with the aim of ensuring mitigation is fit for purpose e.g. to understand what is required to ensure protection of the fish stocks but also ensure that restrictions are minimised and proportionate.

1.2.28 Once the process of determining potential herring spawning habitat was complete, the resulting method was then used for a case study to demonstrate whether a piling restriction was needed for hypothetical offshore windfarm 'X'. The fundamental aim of the ORJIP report was to refine the process of determining potential herring spawning habitat, not refine the methods and parameters used in underwater noise modelling.

1.2.29 If the applicant is suggesting that modelling based on a fleeing receptor has been used to support the assessment of impacts from underwater noise in the ORJIP report, then this has not been clearly stated and is misleading.

1.2.30 Nonetheless, the MMO add that support for the merits of a particular study does not (and should not) equate to a blanket endorsement for specific information put forward by the applicant in support of their case for TEOWF.

Potential Behavioural Impacts

1.2.31 In addition to the overlap for mortality, recoverable injury and Temporary Threshold Shift (TTS) clearly demonstrated that the potential effects on fish from anthropogenic noise can also include behavioural changes which need to be considered.

1.2.32 The applicant's conclusions as to the impact on spawning potential do not consider the behavioural effects to fish which will occur over larger ranges and at lower sound levels than the TTS threshold. Although the MMO recognise that there are no universally accepted noise impact behavioural criteria for fish, the behavioural effects on fish as a result of piling cannot be discounted.

1.2.33 There is considerable uncertainty in assessing the risk of behavioural responses, since they are highly dependent on many factors, including behavioural context. Behavioural changes can have a significant impact to a population if sound causes fish to move away from foraging or breeding grounds, cease reproductive activities, or change their migratory behaviour. Thus, there are uncertainties as to if, and how, sound may affect the behaviour of the East Channel and Thames Estuary herring. Nonetheless, behavioural responses would be expected to occur over larger ranges, at sound levels lower than the TTS threshold.

1.2.34 Herring is considered to primarily detect sound pressure, and possesses a swim bladder which is involved in hearing. According guidance in Popper *et al.* (2014), there is a moderate risk of behavioural effects for fish with swim bladder involved in hearing in the far field (in the thousands of metres from the source), and high risk of behavioural effects in the intermediate (hundreds of metres) and near field (tens of metres).

1.2.35 Behavioural effects are particularly difficult to assess, since they are highly dependent on behavioural context (Ellison *et al.*, 2012; Popper *et al.*, 2014) and responses may not scale with received sound level. Consequently, there is considerable uncertainty in assessing the risk of behavioural responses (and therefore uncertainty in the extent of herring spawning habitat that may potentially be affected).

1.2.36 The MMO cannot confidently say that the additional modelling results demonstrate the likely impact on spawning stock of herring is within acceptable limits. There is no evidence to support the conclusion that behavioural impacts are unlikely to significantly impact on spawning activity. It is not known if, and how, anthropogenic

noise from the piling operations may affect the behaviour of the East Channel and Thames Estuary herring during this critical life stage. The applicant was previously asked to model the received levels of single pulse Sound Exposure Level at the spawning grounds, however, this information has not been provided.

1.2.37 The applicant has however provided clarifications immediately prior to deadline 6 which they feel may address this matter – the MMO will provide further comment at deadline 7 in that regard.

1.2.38 In respect of behavioural responses, the applicant has suggested that *“herring are considered to be potentially less responsive to noise when involved in either feeding or actively spawning compared to when generally swimming, which is plausible.... Therefore, it is considered that behavioural impacts are unlikely to significantly impact on spawning activity...”* At the same time, when considering injury/TTS, the applicant is of the opinion that a fleeing receptor is nevertheless more robust and a ‘suitably precautionary’ approach, which, the MMO would highlight that in the case of spawning herring, is a concern if they ‘flee’ from spawning grounds.

Mitigation Options

1.2.39 The MMO acknowledge that the recommended piling restrictions equate to four and half months of each construction year when piling would not be permitted. This would inevitably create a prolonged construction schedule and increase the cost of the development.

1.2.40 The most direct and comprehensive way to mitigate the risk of acoustic impact on marine species is to reduce the amount of noise pollution emitted at source. Noise reduction technologies available, such as big bubble curtains and acoustic barriers, are being routinely deployed in German waters and the MMO would encourage consideration of such measures. If such measures are put in place (in accordance with the standards applied in German waters; Umweltbundesamt, 2011), this may lower the risk of impact sufficiently to recommend that piling can be permitted during the spawning period. The use of bubble curtains to reduce noise propagation when piling could reduce the impact of underwater noise and vibration on fish and may lower the risk of impact sufficiently for piling to be unhindered during all or part of all of the spawning seasons for herring, or could be used in conjunction with spatial piling restrictions.

1.2.41 In addition, a spatio-temporal restriction, as applied to OWFs such as Triton Knoll, could allow for a phased construction schedule which targets specific wind turbine generators (WTG) at set periods of time to avoid impact to spawning grounds.

1.2.42 The MMO position has been arrived at following consultation with respective interested parties including, the Kent and Essex Inshore Fisheries Conservation Authority (KEIFCA), National Federation of Fishermen’s Organisation (NFFO) and Thanet Fishermen’s Association (TFA). The MMO has shared the revised modelling from the applicant with the parties and sought their views on the conclusions and the proposed piling restriction.

1.2.43 KEIFCA support the advice and proposals put forth by the MMO.

1.2.44 TFA equally support a proposed piling restriction for at least Nov-Jan in respect of herring spawning.

1.2.45 The NFFO suggest that applied mitigation should err on the side of caution and support temporal piling restriction during the spawning season for both herring and sole as a licence condition.

1.3 Sole Spawning Grounds

Potential Impacts

1.3.1 The potential effects for sole can be delineated into potential effects on gravid and/or migrating adults (sole can migrate between spawning grounds in spring and summer to further offshore in winter) and into potential effects on egg and larval stages, essentially discerning effects on both spawning and migrating adults which are already part of the overall North Sea sole stock, as well as egg and larval stages which may contribute to stock recruitment.

Noise from pile-driving during construction causes particular concern as the very high sound pressure levels could potentially prevent fish from acoustically locating mates, finding foods and reaching spawning or breeding sites that may result in long-term effects on population and reproduction factors (Mueller-Blenkle et al., 2010). Potentially, reduced catches could result from avoidance reactions might displace fish from prospective fishing grounds (Mueller-Blenkle et al., 2010).

1.3.2 Juvenile and adult sole are classified as the fish with no swim bladder or other gas chamber hearing group according to the 2014 fish sound exposure guidelines (Popper et al., 2014, hereafter referred to as the Popper criteria) and are less susceptible to barotrauma compared to the fish with swim bladder hearing group (which includes herring). They detect only particle motion and not sound pressure, though some barotrauma could result from sound pressure. The Popper criteria classifies egg and larval stages into a separate category.

1.3.3 Even though they may be perceived to be 'less sensitive', Sole are still susceptible to mortality and potential mortal injury, recoverable injury, temporary threshold shift (TTS), masking and behavioural effects caused potentially by piling noise. The Popper criteria thresholds for mortality and potential mortal injury as well as recoverable injury are higher for sole compared to herring. While the physiological and morphological effects are better documented, behavioural effects are more difficult to determine as these cannot be studied in a laboratory and very few field studies have been conducted. How fish respond and react to sound depends on a wide range of factors. As behavioural effects are highly dependent on behavioural context, they are particularly difficult to assess and responses may not scale with received sound level. Accordingly, there is considerable uncertainty in assessing the risk of behavioural responses (and therefore uncertainty in the extent of sole and associated spawning grounds that may potentially be affected).

1.3.4 Behavioural effects may include changes to stopping/delaying eating, mating, leaving breeding ground and changes in migration pathways. While these can be transient (i.e. no consequence to the animal), they could also possibly be more longer lasting effects such as effecting recruitment into the stock (if larval survivability is impaired or reduced).

1.3.5 There are very few studies which specifically examine the potential effects of piling noise on sole. Pile driving noise was played back to sole held in large net pens (40 m) in a quiet bay in west Scotland (Mueller-Blenkle et al., 2010). Received sound

pressure level was measured during the experiments and a significant movement response was detected at relatively low received sound pressure levels (144 – 156 dB re 1 μ Pa Peak). Behavioural effects were recorded as sole showed a significant increase in swimming speed during the playback period compared to before and after playback.

1.3.6 Essentially the significance of impact to sole depends on the degree of the behavioural response. However, a significant population level impact may occur if noise causes fish to move away from foraging grounds breeding/spawning or, cease reproductive activities, or change their migratory behaviour, for example.

Sole are a predominantly demersal species and spawning within the Greater Thames Estuary is known to take place along the edges of sandbanks. Sole may be vulnerable to vibration associated with the ground roll or Rayleigh waves generated by pile driving, though very little is known about these potential effects. Propagation of waves through the ground (vibration through the sediment) has been little studied particularly underwater (Hazelwood, 2012) and researchers are now considering how animals living on the substrate are getting stimulated by sounds in the water and out of the substrate. Consequently, potential lethal, sub-lethal and behavioural effects caused by piling noise at the Thanet Extension are a concern.

1.3.7 Sole spawn pelagically, and consequently eggs and larvae are free floating, while having limited motility, instead are subjected to currents and wave dynamics. They can potentially be exposed to physiological, morphological and to a certain extent behavioural effects, including physical damage and survivability. The extent to which sub-lethal effects had been studied for eggs and larvae is almost non-existent. Sole have a swim bladder in some of their larval stages which may render larvae susceptible to pressure-related injuries (e.g. barotrauma).

1.3.8 A study was conducted in 2011 by IMARES who developed a device which could expose fish larvae to underwater sound. The device was used to examine lethal effects of sound exposure in common sole (*Solea solea*) larvae of different developmental stages. The study used reproduced pile driving sounds in the frequency range between 50 and 1000 Hz, at zero to peak pressure levels up to 210 dB re 1 mPa² (zero to peak pressures up to 32 kPa) and single pulse sound exposure levels up to 186 dB re 1 mPa²s; different developmental stages were exposed to various levels and durations of pile-driving sound. The highest cumulative sound exposure level applied was 206 dB re 1 mPa²s, which corresponds to 100 strikes at a distance of 100 m from a typical North Sea pile-driving site. The authors found no damage to different larval stages of sole even at sound levels as high as an SEL_{cum} of 206 dB re 1 μ Pa²·s (Bolle et al., 2012). However, the experiment did not actively record behaviour, though the authors had the impression that larvae exposed to high sound pressure levels were 'stunned' after the experiment. The larvae exhibited a reduced amount of swimming activity compared to control larvae. Recovery appeared to occur quickly as no behavioural differences were observed a few hours after the experiment. The researchers focused on the potential lethal effects of sound exposure and not on other potential effects. They did not examine the larvae for damage to the tissues, hearing or how it may have affected the physiology (e.g. growth rates) which did not lead to death within the monitoring period. These may affect survival and lower it in the long-term.

1.3.9 Information is lacking with regard to the sound levels at which mortality or injury will occur is limited for juvenile and adult fish and virtually non-existent for fish eggs and larvae (Bolle et al., 2016). As planktonic larvae are passively transported by currents they have limited capabilities of avoiding sound exposure and as a result, fish

larvae may suffer more from underwater sound than older life stages (Bolle et al., 2016). Research has mainly focused on injury and mortality assessments, whereas sound exposure may also affect physiology or behaviour and hence predation and starvation risks. The 2016 study by Bolle et al., shows that the potential noise impacts on developing eggs and larvae needs to be considered for sole.

Significance of Sole

1.3.10 Sole spawning and nursery grounds in the Thames estuary are considered to be of national and international importance to the North Sea stock. Historic trends show that sole is vulnerable to anthropogenic pressures and impacts. The latest ICES' advice, released in November 2018 (ICES, 2018), for North Sea sole indicates that whilst fishing mortality has shown a declining trend since 1995, the spawning stock biomass (SSB) has fluctuated around the precautionary reference point (Bpa) for 15 years, with the trend only increasing above this in the last few years, though SSB has had an upward inclination since 2007. There appeared to be occasional large peaks in recruitment in the 1980s and 1990s, with more moderate recruitment in recent years. The stock is assessed as being harvested sustainably.

1.3.11 Technically, sole is a long lived species, but due to heavy exploitation its life expectancy is no longer high (Heessen et al., 2015). Female maturation is around 28 cm and 2-3 years of age, with $L_{50\%}$ decreasing in North Sea females, presumably due to fisheries-induced evolution (Mollet et al., 2007).

1.3.12 As outlined above, sole can be considered sensitive to the potential impacts of underwater noise, both in adult and egg and larval life stages. Recoverability is partly determined by the state of the stock, which is currently considered to be harvested sustainably, with a slight increasing trend in SSB in recent years, though recruitment is more moderate, therefore they are likely to have a high recoverability.

1.3.13 As such, the MMO suggest that Sole are:

- of medium-low vulnerability; given they are susceptible to anthropogenic effects taking to around age 3 for 50% to spawn and potentially contribute to recruitment and SSB
- of national and international importance (Thames estuary sole) and
- have potential for high recoverability

All of which is largely in agreement with the applicant's ES.

Modelling

1.3.1 The MMO previously raised that in the ES the Applicant has presented an overlay of the 186 dB re 1 μ Pa_{2s} SEL_{cum} (TTS threshold) noise contours along with only herring spawning areas (ES Figure 6-14). Therefore, the noise contours have not been overlaid onto identified sole spawning grounds (refer to ES Figure 6-4). Providing a figure with the TTS threshold (modelled based on a stationary receptor) would show the potential impact range for injury to sole.

1.3.2 Whilst this has not been provided, prior to deadline 6 the applicant has offered clarifications, suggesting that paragraphs 25-26 in the revised modelling submitted at deadline 4c ([REP4C-009](#)) competently address this issue.

1.3.3 In addition, as outlined above the MMO do not support the calculation of total spawning habitat because the use of spawning map data does not provide information on all the relevant factors that contribute to suitable conditions for fish spawning and therefore the assumption that all of the area is suitable for herring/sole spawning cannot be entirely justified.

1.3.4 It is noted that with regard to sole; there is no long-term larval dataset for sole (such as IHLS data used for herring) which could demonstrate areas of high intensity or higher larval abundance and provide an overview of spatial changes in spawning intensity/larval abundance.

1.3.5 Consequently, with the above factors taken into consideration, we cannot agree that a particular percentage of a spawning stock affected by noise impact thresholds in any one year is accurate.

1.3.6 At this stage, the MMO are unable to confirm that the likely impacts on spawning sole have been adequately assessed and are within acceptable limits. Due to the national and international importance of the Thames sole spawning and nursery grounds, and the regional importance of the Thames sole fishery, the timing of piling activity must be considered in relation to the sole spawning season.

1.3.7 As stated, the applicant has provided clarifications in respect of the previously requested modelling. The MMO will provide full and final comment at deadline 7 as to whether these are sufficient and will advise on whether any additional mitigation is necessary.

Thanet OWF Piling Restriction

1.3.8 The ExA has requested that the original piling restriction in respect of Thanet OWF be provided. The condition is included in Annex A enclosed with this submission at section 9, 'Supplementary Conditions' – 9.1.3, and is as follows:

1.3.9 *“The Licence Holder must ensure that seismic surveys and pile driving operations are not conducted between mid February and the end of April so as to avoid the main spawning period for Thames herring. All pile driving operations must use a 'soft start' procedure.”*

2. Comments on the ExA's dDCO commentary

2.1 Comment no. 5 – Interpretation: “commence”

2.1.1 The ExA identifies that the current definition retains scope for some substantial operations relevant to environmental effects to take place before formal commencement of the authorised development and the discharge of relevant requirements and/or DML conditions. This would create a situation in which marine licensable activities could be taking place outside of any authorisation contained within the marine licence which the order will deem to have been granted, which is unacceptable.

2.1.2 The nature and scale of seabed preparation and clearance is such that it might lead to significant effects that should be taken into account prior to the finalisation of relevant plans or strategies and in decisions to discharge DML conditions. Such conditions are correctly listed by the ExA in the commentary, namely 8 (aids to

navigation), 13 (submission and approval of pre-construction plans or documents) and 20: (the fisheries liaison and co-existence plan).

2.1.3 As such, the MMO has requested the applicant make necessary drafting amendments to ensure those requirements relevant to the undertaking of seabed preparation and clearance are reflected throughout the dDCO and DMLs, as if it were included in the definition of 'commence'. The applicant has suggested they will make the amendments accordingly.

2.2 Comment no. 22 - Arbitration: proposed role for the Centre for Effective Dispute Resolution

2.2.1 Given our fundamental opposition to the application of the arbitration provision to the MMO, it is not appropriate for us to comment on who might be appointed as an arbitrator.

2.3 Comment no. 23 – Arbitration: application to determinations by statutory and regulatory authorities

2.3.1 Article 37 has no application to the MMO, we are not therefore likely to experience the situation the ExA outlines in relation to the application of Article 37 and have therefore no comment to make in relation to this comment.

2.4 Comment no. 24 – Arbitration: application to determinations under Requirements (Schedules 1 and 10) and Conditions (Schedules 11 and 12)

2.4.1 The MMOs view is it is not sufficiently clear on the current drafting of Article 36 that the arbitration provisions set out in of Article 36 do not apply to the MMOs decisions and determinations in respect of the DMLs set out in Schedules 11 and 12 of the Order.

2.4.2 As such, the MMO requests amendments to the drafting that make it explicit that the MMO is not subject to the provision. An example of such appropriate revised drafting to article 36 has been put forward by Trinity House (TH) in their deadline 3 submission ([REP3-071](#)), the MMO preference is that the applicant uses similar wording in this dDCO. Please also see comments at 2.5.11 in respect of preferred wording.

2.5 Comment no. 25 – Arbitration: application to the MMO and DMLs

2.5.1 The MMO does not believe the reasons for the extension of the arbitration process to its decisions and determinations has been properly justified. Since its inception the MMO has undertaken licensing functions on ~130 DCOs¹ comprising some of the largest and most complex renewable energy operations globally. The MMO is not aware of an occasion whereby any dispute which has arisen in relation to the discharge of a condition under a DML has failed to be resolved satisfactorily between the MMO and the applicant, without any recourse to an 'appeal' mechanism

2.5.2 The MMO is an open and transparent organisation that actively engages with and maintains excellent working relationships with industry and those it regulates. The MMO discharges its statutory responsibilities in a manner which is both timely and

¹ MMO (May 2019), figures obtained from the Marine Case Management System.

robust in order to fulfil the public functions vested in it by Parliament. The scale and complexity of an NSIP creates no exception in this regard and indeed it follows that where decisions are required to be made, or approvals given, in relation to these developments of significant public interest only those bodies appointed by Parliament should carry the weight of that responsibility. There is no compelling evidence as to why the applicant in the case of TEOWF should be an exception to the rule and treated differently to any other marine licence holder.

2.5.3 The MMO sees no reason why it should be subject to a provision for which there is no clear precedent and which is unnecessary. If there were a problem to resolve, and its resolution would be achieved by extending the arbitration provisions to decisions/determinations to be taken/made by the MMO, then what the applicant proposes would be more readily understood. The practical result of the ExA allowing the arbitration process in Article 36 to expressly apply to the MMO's decisions would be the ExA establishing a new procedure and recourse for this applicant to address an issue which has not as yet, ever arisen. No clear or convincing justification has been put forward by the applicant as to why the discharge of conditions under a deemed marine licence should be subject to arbitration, nor has the applicant explained why they should be able to avail themselves of a dispute mechanism around the determinations the MMO will make in relation to the discharge of conditions under a licence deemed to have been granted via the NSIP process in circumstances where the holder of a licence granted directly by the MMO under Part 4 the 2009 Act will not have any such dispute mechanism.

2.5.4 The inclusion of such a provision as drafted will create inconsistency with decisions made under DMLs and those made in relation to those marine licences issued directly by the MMO. This will create a 2-tier licensing approach. The MMO reiterates in the strongest possible terms that DMLs granted as part of a DCO should not be treated differently to a marine licence granted directly by the MMO under the Marine and Coastal Access Act 2009 (MACAA), as this will lead to disparity between licence holders, and an uneven playing field across a regulatory regime.

2.5.5 There is no indication, under either the Planning Act 2008 or the Model Clauses provisions that this is what was intended by Parliament or the Secretary of State: namely, that licences or consents deemed granted by reference to a specific provisions of another enactment, and which required further approvals by a named body, should be subject to a different regime in the event of the applicant being dissatisfied by the outcome of that further approvals than would be the case for a licence expressly granted under the same provisions of the same enactment. Such a suggestion would also seem inconsistent with the guidance set out in PINS Guidance Note 11, namely that: *“the MMO will seek to ensure wherever possible that any deemed licence is generally consistent with those issued independently by the MMO”*.

2.5.6 This could also result in different processes applying to different licences relating to the same project: please refer, in this regard, to Article 4(2) of the draft Order which envisages a situation where the applicant could need to apply for a further licence under the 2009 Act not deemed granted by Article 30 there will be no arbitration process applied in relation to any licence granted for this development, directly by the MMO, in the future.

2.5.7 In addition, the effect of the proposed change, in this case, would be to replace the review of the MMOs decision making on conventional public law grounds (via the process of judicial review) (for discharge of conditions under an expressly

granted licence) with a merits review by an arbitrator. This is a fundamental departure from what Parliament intended, and the MMO can see no justification whatsoever for such a fundamental change – particularly where the purpose of the deemed licence regime under the Planning Act 2008 is to essentially remove the need for a separate application for a licence alongside or following the making of the Order and not to fundamentally change the regulatory regime that applies.

2.5.8 Furthermore, clear justification would be needed for removing the decision making from the MMO – the body entrusted by Parliament with such decisions under the 2009 Act (subject to review by the Courts) – to a private body or person, whose role would be to adjudicate the point as between the applicant and the MMO.

2.5.9 The MMO draws the ExA’s attention to the clear and well-established principle that the Courts will be very slow to conclude that an *“expert and experienced decision-maker assigned the task by statute has reached a perverse scientific conclusion”*: *Mott v Environment Agency* [2016] 1 W.L.R. 4338 (CA). In light of this, the MMO’s view is that it would require clear and compelling evidence that it was necessary and appropriate (and/or what had been intended by Parliament) to conclude that that heightened level of defence to decisions of a statutory body in the technical/environmental field be displaced by a decision, on the merits, by a private third party arbitrator. The Applicant has not provided any compelling reasons why this is necessary.

2.5.10 In addition, whilst the MMO understand each case is examined on its own merit, it equally understands that the PINS recognises the importance of consistency in its recommendations to Secretaries of State. As such, the MMO highlights that in the case of Tilbury2 port facility the ExA’s Recommendation Report to the Secretary of State found in favour of the MMO for reasons stated in its submissions, noting:

“The MMO stated that it strongly opposed the inclusion of such a provision, based on its statutory role in enforcing the DML. According to the MMO, the intention of the PA2008 was for DMLs granted as part of a DCO in effect to operate as a marine licence granted under the MCCA2009. There was nothing to suggest that after having obtained a licence it should be treated any differently from any other marine licence granted by the MMO (as the body delegated to do so by the SoS under the MACAA).

“Having considered the arguments of the Applicant and the MMO, the Panel finds in favour of the MMO in this matter for the reasons stated in the paragraph above.

Accordingly, the Panel recommends that paragraph 27 is deleted from the DML at Schedule 9 of the draft DCO.”

2.5.11 Similarly, the MMO notes that on 26 February 2019, the ExA for the Hornsea 3 offshore wind farm published its schedule of changes to the dDCO amending arbitration in favour of submissions made by the MMO. They proposed the following:

“Any matter for which the consent or approval of the Secretary of State or the Marine Management Organisation is required under any provision of this Order shall not be subject to arbitration.”

The MMO would be supportive of this wording as with that noted above at 2.4.2.

In its commentary the ExA questioned whether inclusion of such a provision could establish a precedent for DMLs under the Planning Act to be treated differently from marine licences granted under MACAA. The MMOs view is that the inclusion of this provision would do just that. Whilst each DCO application is considered on its own merits and in light of the particular circumstances of the development to be authorised under the Order, applicants regularly bring forward dDCO's which are very heavily based on the drafting of orders which have previously been granted. Whilst it is not the case that any order granted creates a legally binding precedent for applications which follow, the reality is that applicants will cite orders which have been granted as justification for the inclusion of the same provisions within their dDCO's. In the MMOs view, if this application were to be granted on terms which would allow the MMOs decisions to be made subject to the arbitration process, this will be relied on by other applicants in order to have their orders granted on the same basis. Should the ExA in this case was to allow the arbitration provision set out in Art 36 of this dDCO to apply to the MMOs decisions around the discharging of conditions under the deemed marine licences, then should the Secretary of State grant the order on the same terms, this would in a very short space of time create a dual regulatory regime in which marine licences issued under the NSIP process would be treated very differently to those issued directly by the MMO. Extending the arbitration process to the MMO's regulatory decisions will affect its capability to undertake the responsibilities Parliament expressly vested in it.

2.6 Comment no. 26 – Arbitration general appropriateness of provision: effects on statutory authority duties etc.

2.6.1 The MMO has reviewed the submissions made on the approaches taken in the Norfolk Vanguard and Hornsea 3 examinations and the Counsel's written Opinion the applicant has provided in support of its application. The MMO's position, as it outlined above in relation to Comment 25, is that there is nothing in these submissions which justify why there is any need to change the current position and to extend the arbitration process to the decisions of a regulatory body. The MMO's view remains that it is both inappropriate and unnecessary to extend arbitration to the decisions it will take in the discharging of any conditions under the marine licences which will be granted under the terms of the dDCO. There is no justification for dispensing with the judicial review process that is already available to the applicant to challenge any public law decision the MMO may take, or fail to take, in determining whether to discharge any conditions under the DMLs.

The MMO recognises that there may be circumstances where the applicant submits documents/plans to the MMO for approval and the MMO will decline to approve the documents/plans as submitted. Disputes arising in relation to this are almost always resolved by discussion between the MMO and the applicant and where agreement cannot be reached the applicant can seek to challenge this using the established public law process of judicial review. It is the MMO's position that the applicant, in trying to introduce arbitration provisions, is attempting to resolve a problem that does not exist.

2.6.2 The MMO also recognises that there may be circumstances where the applicant submits documents/plans to the MMO for approval and the MMO will not determine whether or not to approve the documents/plans as submitted within the timescales the applicant would wish. The MMO does not unnecessarily delay such decisions, these matters are complex and require views to be sought from other statutory consultees, all of which takes time. Again, any disputes arising in relation to how long the MMO takes to determine an application to discharge a condition of a DML

can almost always be resolved by discussion between the MMO and the applicant, but if the MMO 'fails' to make its determination within a timescale the applicant feels is reasonable again the applicant can seek to challenge this 'failure to make a decision' using the established public law process of judicial review.

2.6.3 As a public body, the MMO has a number of specific statutory powers and duties, and a responsibility to act in the public's interest. The MMO is therefore rightly subject to public scrutiny on the decisions it makes which often fall to be taken only after public consultation. Article 36 in the dDCO applies to 'differences' which arise under the provisions in the Order. The MMO maintains its position that such an approval is a regulatory decision, it is not 'agreeing' or 'disagreeing' with the applicant so that a divergence of views can properly be characterised as a 'difference'. When discharging a condition, the MMO is making a decision as a public body in response to an application, taking account of the broad sweep of its statutory responsibilities.

2.6.4 The MMO is able to make other decisions in relation to the DMLs once the order is granted, these include decisions to vary licences, revoke licences, transfer licences. The MMO also makes decisions around enforcement in the event that the provisions of marine licences are not complied with. If the 'decisions' of the MMO are to be made subject to the arbitration provisions, then any 'differences' between the MMO and the applicant around enforcement would also be made subject to the arbitration process. Whilst it seems this would be an inadvertent extension of the arbitration process, it is a practical consequence of extending Article 36 to decisions made by the MMO. This is again unnecessary, is not justified in the submissions made on behalf of the applicant, and is unacceptable.

2.6.5 The written Counsel's opinion supplied to the ExA by the applicant cites cases at §23, in support of the applicants position on this issue. Whilst the MMO does not dispute that public authorities are, in principle, capable of being a party to arbitration as discussed in the applicant's advice from Counsel ([REP5-023](#)) the MMO does not agree that that the cases cited at §23 of Counsel's Opinion are directly applicable to issue currently being considered. The MMO and the applicant have not entered into an agreement providing for arbitration and the question in relation to this application is therefore whether the Order, if confirmed, should provide for disagreements relating to the discharge of conditions under the deemed marine licence to be subject to arbitration. This is a different scenario to the circumstances in Fulham Football Club (1987) Ltd v Richards [2011] EWCA Civ 855² and Assaubayeve v Michael Wilson Partners Ltd [2014] EWCA Civ 1491.³

2.6.6 , The MMO does not agree that the wider analysis set out at §25-26 for the reasons set out below.

2.6.7 The analysis at §25-36 of Counsel's Opinion is clearly premised on the presumption that arbitration is appropriate (or available) and analyses whether the exclusion of the subject matter from arbitration is "*a safeguard...necessary in the public interest*". With respect, that is not the starting point for these discussions; what has to be considered in the case of this application is whether the Order should provide for the discharge of conditions to be subject to arbitration in the event of a refusal by the MMO

² The FAPL rules provided that membership of the FAPL was deemed to constitute an agreement between the FAPL and the members clubs and between the members clubs to be bound by, and comply with, (inter alia) the FAPL rules and FA Rules. Both the FA rules and FAPL rules provided for arbitration.

³ Arbitration was provided for as one means the parties could choose to resolve disputes arising under a retainer for legal services.

when decisions as to discharge of conditions under a licence granted directly by the MMO under the 2009 Act would be subject only to review by a Court on judicial review grounds (i.e. creating a separate marine licencing regime where the powers of the MMO are determined by a private arbitration process)

2.6.8 As mentioned above, the MMO does not consider that there is an issue with the current process as the vast majority of disputes are resolved by way of discussion between the MMO and the applicant. In addition it should be noted that in relation to Town & Country planning, provisions in relation to the discharge of conditions have been considered by Parliament and are contained in statutory instruments. No cogent reasons have been put forward to suggest why further restrictions (over and above those placed on all public bodies by way of judicial review) on the MMO's decision-making ability are required in this instance or why if they are needed they shouldn't be introduced by way of statutory instrument.

2.6.9 The MMO considers there are serious legal and practical issues in trying to implement an arbitration process onto the MMO's existing public law regulatory functions. The emphasis lies on the fact that Parliament has vested the public law functions such as discharging marine licence conditions upon the MMO. The removal of this decision-making function and their placement into the hands of a private arbitration process is inconsistent with the MMO's legal function, powers and responsibilities. Furthermore, there was no indication that Parliament ever considered that in passing the 2008 Planning Act it would be authorising this kind of usurpation of public functions.

2.6.10 Section 2 of MACAA 2009, which came into power after the 2008 Planning Act, sets out a series of broad statutory purposes and functions vested onto the MMO to achieve certain environmental objectives in the discharge of activities and to take certain matters into account in a consistent and coordinated way. None of those obligations would bind an arbitrator, which is a serious issue for the MMO given that Chapter 3 of Part 1 in MACAA 2009 itself contains a provision on how the functions the MMO performs can only be delegated to eligible parties under s.16 with the agreement of the Secretary of State.

2.6.11 Furthermore, the applicant previously argued in their deadline 4c submission ([REP4C-007](#)) that: *"...the arbitration process is not solely to be utilised following a decision being made by a stakeholder as part of the DMLs. The arbitration process can be used to resolve disagreements between the parties and to minimise the delay caused by this. This could include, for example, disagreements about the type or production of evidence."* Such examples are technical decisions which fall correctly on the MMO to take. The MMO questions whether an independent arbiter with no technical background would be best placed to make such a decision on evidence requirements.

2.6.12 Nonetheless, an arbitration mechanism involving the MMO would in practice only be related to an approval process. Since Parliament has vested the public-law functions regarding discharging marine licence conditions in the MMO, removing its decision-making functions and placing them into the hands of a private arbiter is inconsistent with the MMO's responsibilities.

2.6.13 Another consideration is that allowing the MMO's statutory functions to be undertaken by an arbitrator removes the ability of both the MMO and the applicant to appeal decisions that they disagree with on public law grounds. The judicial review procedure has been created to ensure public scrutiny of decisions. This strikes a

balance of allowing the public body charged with making the decision to make its decision, whilst ensuring that decisions made by public bodies are made correctly and are susceptible to public scrutiny. If either party disagrees with the decision of the High Court then this can be appealed to the Court of Appeal and ultimately the Supreme Court. NSIPs are some of the most important projects in the country. It is essential that they are undertaken correctly. To entrust the final decision in the event of a dispute to an arbitrator, who is not susceptible to the same public scrutiny or appeal is in the MMO's opinion inconsistent with the objectives of the 2008 Planning Act.

2.6.14 The MMO recognises the intention of the arbitration provision to resolve disputes between the applicant and third parties, however maintains that this provision should not be used to remove the decision making powers from the MMO (as the regulator delegated by Parliament to take such decisions) and place this in the hands of an independent arbiter.

2.7 Comment no. 40 – DML security for offshore design parameters

2.7.1 Prior to deadline 6 the MMO had discussions with the applicant in respect of the parameters required on the DMLs and the applicant has suggested they will include these. Nonetheless the MMO acknowledges the comment raised by the ExA and will review the applicant's response and final dDCO following submission.

2.8 Comment no. 44 – Construction monitoring: noise measurements and cessation of piling

2.8.1 The MMO welcomes the ExA's observations in respect that the adequacy of control in the dDCO remains unresolved and that it is not clear that the MMO's statutory powers provide for piling to cease quickly in a situation where construction noise monitoring confirms there is a significant adverse effect.

2.8.2 The MMO has continued discussions on this matter with the applicant and has not reached an area of common ground. The applicant considers current drafting to be sufficient and does not intend to accede to the request. Should alternative drafting be provided at deadline 6, the MMO will review and respond accordingly.

2.8.3 In respect of whether the amended wording would be required to secure a conclusion of No Adverse Effect on Integrity, the MMO defers to the expertise of Natural England as the Statutory Nature Conservation Body on this matter.

2.8.4 Please also see comments at 3.9.6.

2.9 Comment no. 45 – Construction monitoring: noise measurements

2.9.1 In respect of condition 17(3) and schedule 11 and condition 16(3) at schedule 12, the ExA has requested the MMO review the concluding terms, namely: *"[t]he assessment of this report by the MMO will determine whether any further noise monitoring is required"* to provide clarity on the scope and effect of the determination as currently stated.

2.9.2 The MMO advises that the condition as currently worded, requires that in order to comply with the condition, the undertaker must carry on noise monitoring. It does not make clear that any further compliance is required in the event that noise levels are observed to be greater than predicted.

2.9.3 Without this clarification the MMO's power is limited to instructing on the need for additional monitoring only, with no remit to instruct cessation of piling whilst this is explored. The MMO does have the power to stop works if it is determined there is a danger to human health or the environment. However, this broader instruction as currently defined would require the cessation of all licensable activities, not piling only, and therefore would not allow the developer to continue to undertake other construction activities that do not generate significant levels of impulsive noise whilst the mitigation is reviewed.

2.9.4 In the event that the monitoring reports indicate the failure of mitigation measures as set out in the MMMP, the proposed amendment would require the undertaker to cease piling until further appropriate mitigation actions have been agreed which would mitigate noise impacts sufficiently for piling to recommence. The MMO consider that this recommendation is justified, considering the location of the project in proximity to the Southern North Sea candidate Special Area of Conservation (cSAC) and the potential impacts of the project on harbour porpoise as a qualifying feature of the cSAC and an EPS.

2.9.5 Furthermore as currently drafted, the condition requires the Undertaker to submit noise monitoring six weeks following the installation of the first four piled foundations. This could potentially allow for six weeks of piling to be undertaken that exceeds the predicted noise values before the report is submitted to the MMO. The MMO may then require review and consultation of the report before it can determine that observed noise was in fact greater than predicted. The MMO seeks to ensure that it is notified as soon as possible of any issues that indicate noise levels may be greater than predicted in order to agree any potential additional monitoring or mitigation measures in a timely manner.

2.9.6 The ExA rightly identifies a lack of clarity in the condition, hence the suggested drafting provided previously, most recently at deadline 5a provides greater certainty on the requirements. In summary, for reasons outlined above the present drafting could lead to a potential situation whereby a detrimental impact on the environment results because piling is allowed to continue. In addition, use of the 'blanket' broader instruction would require the cessation of all licensable activities, not piling only and could unnecessarily hinder the developer from undertaking other activities that do not generate significant levels of impulsive noise.

2.10 Comment no. 47 – Post construction: vessel traffic monitoring

2.10.1 The MMO acknowledges that Trinity House (TH) has requested the amendment to Condition 18 to provide for operational vessel traffic modelling. The MMO defers to the expertise of TH on such matters and has no concerns in respect of DML drafting.

2.10.2 The MMO advises the ExA that the provision of VTS is not directly relevant to the provision of services by the MMO. VTS only bears relevance to the MMO inasmuch that it impacts on TH to execute their responsibilities under the terms of the DMLs effectively.

3. Comments on the Applicant's Draft Development Consent Order (dDCO) Revision E (issued 29 April 2019)

3.1.1 Please note, where applicable the matters below should be considered in respect to both deemed marine licences (DML) presented at schedules 11 and 12.

3.2 Arbitration, article 36

3.2.1 The MMO recognises the intention of the arbitration provision to resolve disputes between the applicant and third parties, however maintains that this provision should not be used to remove the decision making powers from the MMO (as the regulator delegated by Parliament to take such decisions) and place this in the hands of an independent arbiter.

3.2.2 As such, the MMO maintains that the current dDCO drafting does not make it explicit that arbitration provisions do not apply to approvals under the DMLs and requests it is amended accordingly.

3.2.3 Recent discussion with the applicant has suggested they maintain their view that arbitration should be the primary mechanism to resolve disputes. However the applicant has informally suggested they may submit further proposals at this deadline 6 which the MMO has not currently had sight of. The MMO remains concerned as to the suggested proposals and should they be submitted in the manner proposed, would wish to comment on why these are not acceptable.

3.3 Interpretation of commence/pre-commencement

3.3.1 Please see comments in section 2.1 on this matter in response to questions raised by the ExA's dDCO commentary.

3.4 Maximum parameters in the DMLs

3.4.1 The following parameters should be included on the DMLs to ensure the maximum impacts remain within those assessed and approved in the Environmental Statement (ES):

3.4.2 **Footprint for disposal activities** - The MMO welcomes the inclusion of the disposal volumes, respective activities and disposal sites on the DMLs however requests that the maximum footprint (area) is also included. The footprint is an important metric in assessing the overall impact of an activity in combination with the volume.

3.4.3 **Maximum permitted cable protection footprint**

3.4.4 **Maximum permitted scour protection footprint**

3.4.5 **Maximum number of cable crossings**

3.4.6 **Hammer Energy** – the MMO requests the maximum hammer energy be stated on the DMLs. The maximum hammer energy is an important metric in ensuring that impulsive noise is within the maximum that was assessed in the ES (and potentially the HRA). If the proposed hammer energy is to increase, the implication is that

underwater noise impacts will increase, and further modelling would be required to demonstrate the scale of this impact. Such a change would most appropriately be dealt with through a variation to the DML.

3.4.7 In recent discussions with the applicant the MMO clarified it is not requesting all parameters cited in the ES be included on the face of the DMLs however those outstanding above should be. The applicant has suggested they will make this revision to the dDCO.

3.5 Notifications and inspections

3.5.1 Condition 6(10) at schedule 11 stipulates that “*Copies of all notices must be provided to the MMO within 5 days.*” The same condition in schedule 12 should be revised to also include this timeframe.

3.5.2 This matter has been raised with the applicant who has suggested they will revise the dDCO accordingly.

3.6 Timescales for approval of pre-construction plans and documentation

3.6.1 The MMO and applicant disagree on the required timescales required for approval of documentation. As stated at deadline 5a the MMO suggests condition 15 is amended to allow a six month approval period, except where otherwise agreed in writing by the MMO. This recommendation is not taken lightly and is based on our experience and detailed understanding of the process required for approval. Indeed it is in the interest of the applicant that the DMLs reflect a realistic and pragmatic timescale and does not present an unrealistic ambition which could adversely impacting on their undertaking of operations.

3.6.2 The MMO and its advisors need an appropriate timeframe to analyse technical information, consult and make informed judgements and decisions. In most circumstances a 4 month pre-construction submission date is unrealistic and potentially counterproductive. The MMO always endeavour to remain as flexible as possible in relation to developer requirements, and a formalising of timescales could lead to MMO resources reducing this flexibility to prioritise the suggested statutory timescale obligations. It should also be noted that developers can occasionally submit discharges late due to unforeseen circumstances, and while the MMO should officially seek to introduce licence enforcement measures at this point, the MMO would prefer to maintain a flexible approach and work with the developer to reach a timely resolution. However, again the introduction of formal timescales for decisions may require the MMO to revert to enforcement measures for late or staged submissions to ensure that it, and the applicant, can avoid missing their statutory schedule milestones.

3.6.3 An approximate overview of the decision making process for discharged documents is outlined as follows:

1. 4 weeks to acknowledge and review the document within the MMO
2. External consultation of this documentation could take up to 6 weeks
3. Once consultation is closed the MMO has to review the response and possibly ask for additional information from the applicant. At this stage the MMO and the applicant would be in discussion to agree on an approach to the responses. This could be for up to 4 weeks.

4. The MMO could then request further information from the applicant, which dependent on the level of detail, could represent a further significant time period of for example 4 further weeks
5. Once this is returned by the applicant, the MMO would begin the consultation process again.

3.6.4 It is noted from the above that, even if discharge documentation were to follow the current timescales, and no further communication was required from the applicant (which is highly unlikely) the current turnaround equates to 18 weeks, which is longer than the 16 weeks suggested by the applicant. It should also be noted that the above timescale applies to only one document, when in reality, the number of in-depth discharge requirements could far exceed 30 in total.

3.6.5 The request for 6 months also reflects the increasing complexity of existing OWF projects due to HRA, case law, an increasing volume of documents and a rise in in-combination issues associated with other projects. Of particular note is the anticipated growth in the UK offshore wind sector – noting an additional 8 proposed extension projects and the Crown Estate’s round 4 leasing underway.

3.7 Site Integrity Plan

3.7.1 Current wording in the dDCO suggests the Site Integrity Plan (SIP) is to be approved prior to ‘operation’ of the scheme. The MMO queries whether this is an error and that the applicant intended the wording to schedule 11, part 4 condition 13(k) and schedule 12 part 4 condition 11(l) to require the SIP to be submitted prior to commencement of the licensed activities.

3.7.2 The condition should also be amended to recognise that the timescales on the DMLs are not currently consistent with the draft SIP which proposes two 4-month review stages.

3.7.3 These matters have been raised with the applicant who has suggested they will revise the dDCO accordingly.

3.8 Dredge Disposal

3.8.1 Sub-paragraph (2) of condition 22 states: “*Any man-made material must be separated from the dredged material and disposed of on land, where reasonably practical.*”

3.8.2 The MMO questions whether the reference to ‘disposed’ could contradict the purpose of the WSI. In addition, were the material to be ‘landed’ the MMO may not have the full power to enforce the WSI.

3.8.3 The MMO is in discussion with the applicant to seek clarification on this matter and ascertain if further amendments are required.

3.9 Certified documents, schedule 13

3.9.1 The MMO notes the applicant intends to certify a number of documents in order that they are “*complied with as certified*”. The MMO advises that current drafting does not provide a mechanism to undertake revisions for those documents where this

may be required such as in the case of the Biogenic Reef Mitigation Plan which is not finalised and the Fisheries Liaison and Co-existence Plan which is considered a 'live' document subject to ongoing changes throughout the project. Furthermore please note the Fisheries Liaison and Co-existence Plan is listed incorrectly at the 'Fishing Liaison and Co-existence Plan' in schedule 13.

3.9.2 These matters has been raised with the applicant who has suggested they will revise the dDCO accordingly.

3.9.3 The MMO further notes that there does not currently appear to be any provision within the DMLs stating that the documents in Schedule 13 must be complied with as certified. The MMO that article 35 in Part 7 of the DCO 'Certification of Plans' includes sub-paragraph (4) stating:

(4) Each programme, statement, plan, protocol or scheme listed in Schedule 13 must be complied with as certified.

3.9.4 In order to ensure compliance the MMO has requested the applicant revise the dDCO and including drafting to ensure that once 'deemed' the DMLs can ensure compliance in respect of Schedule 13 as outlined above. The applicant has confirmed they are considering this request.

3.9.5 Finally the MMO highlights that several documents in schedule 13 require amendments to titles as raised by the ExA in order to reflect that they are outline/draft versions and not finalised, such as the Operations and Maintenance plan. This matter has been raised with the applicant who has suggested they will revise accordingly.

3.9.6 **Cessation of piling – noise levels** – The MMO reiterates its position at deadline 5a, please also see comments at 2.8.4 following the ExA's dDCO commentary.

3.9.7 The MMO submitted its response at deadline 3 providing further detail on its powers to stop works, and the limitations in regards to the current wording of the condition at schedule 12, condition 16(3) and schedule 11, condition 18(3). The MMO seeks to ensure that it is notified as soon as possible of any issues that indicate noise levels may be greater than predicted in order to agree any potential additional monitoring or mitigation measures in a timely manner. As such, the MMO supports the amended condition wording proposed by Natural England and outlined below. Similar recommendations were made for the Norfolk Vanguard and Hornsea 3 OWF dDCO representations. Indeed, the ExA's schedule of changes to the dDCO for Hornsea 3 issued on 26 February 2019 includes the amended condition wording as follows:

3.9.8 *"(4) The results of the initial noise measurements monitored in accordance with condition 18(2)(a) must be provided to the MMO within six weeks of the installation of the first four 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 Natural England, the assessment shows significantly different impact to those assessed in the environmental statement or failures in mitigation, all piling activity must cease until an update to the MMMP and further monitoring requirements have been agreed.**"*

3.9.1 With the amendment being justified *"In the interests of protecting the integrity of the Site of Community Interest."*

3.9.2 This is a noted area of disagreement on the SoCG with the applicant.

3.10 Pre-construction monitoring and surveys in Goodwin Sands

3.10.1 The MMO notes the revision made to schedule 12, condition 15 regarding monitoring provisions for Goodwin Sands pMCZ on the DML, however suggests the following amendments:

3.10.2 At 15(2)(b)(i) – the MMO questions whether reference to “sub-paragraph (2)(c)” in this section is correct given this refers to a different set of surveys related to saltmarsh.

3.10.3 At 15(2)(b)(i) and (ii) – the current wording only provides for surveys to be undertaken post-construction – i.e. after cable protection has been installed. This wording needs to be amended to make it clear that surveys will also be undertaken pre-construction – i.e. where it is anticipated cable protection will be installed and prior to such works being carried out.

3.10.4 At 15(2)(b)(i) – the current wording should also be amended to provide for surveys taken out pre-construction and post-construction for sandwave clearance and post-construction, in order to be able to fully assess the potential impact if sandwave clearance were undertaken in the pMCZ.

3.11 Mitigation for herring and sole spawning grounds

3.11.1 As discussed extensively in response to ExQ3.1.5 at 1.1 the MMO has suggested mitigation in the form of a temporal piling restriction is conditioned on the licence to coincide with herring spawning in the area. The MMO has also suggested alternative mitigation solutions such as the use of bubble curtains or a phased/targeted construction schedule which may avoid the need for a piling restriction.

3.11.2 With respect to sole, as noted in 1.1 the MMO has been unable to fully assess potential impacts to sole given requested modelling has not been provided. This has been raised with the applicant and a series of clarification points submitted in an effort to reach resolution. The MMO will provide full and final comment at deadline 7 on whether it considers mitigation for sole spawning grounds should be conditioned on the licence.

4. Comments on D5 submissions on the SEZ Material Change application

4.1.1 The MMO has reviewed the additional information submitted by the applicant in respect of the Structures Exclusion Zone.

4.1.2 In respect of commercial fishing activity, the MMO notes the implementation of the SEZ will result in a slight reduction to the impact of loss of fishing grounds, however as this implementation was borne through responses from a number of marine stakeholders, any reduction in impact is unlikely to solely benefit commercial fisheries stakeholders. Consequently, the implementation of the SEZ is unlikely to alter the magnitude of effect of the impacts to commercial fishing receptor groups.

4.1.3 Given the small extent of the exclusion zone in relation to overall available fishing grounds, the MMO agrees that the implementation of the SEZ will not result in a material change to the outcomes of the impact assessment for Commercial Fisheries.

4.1.4 In respect of matters related to seascape, landscape and visual impact and shipping and navigation, the MMO has no concerns to raise at this time.

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