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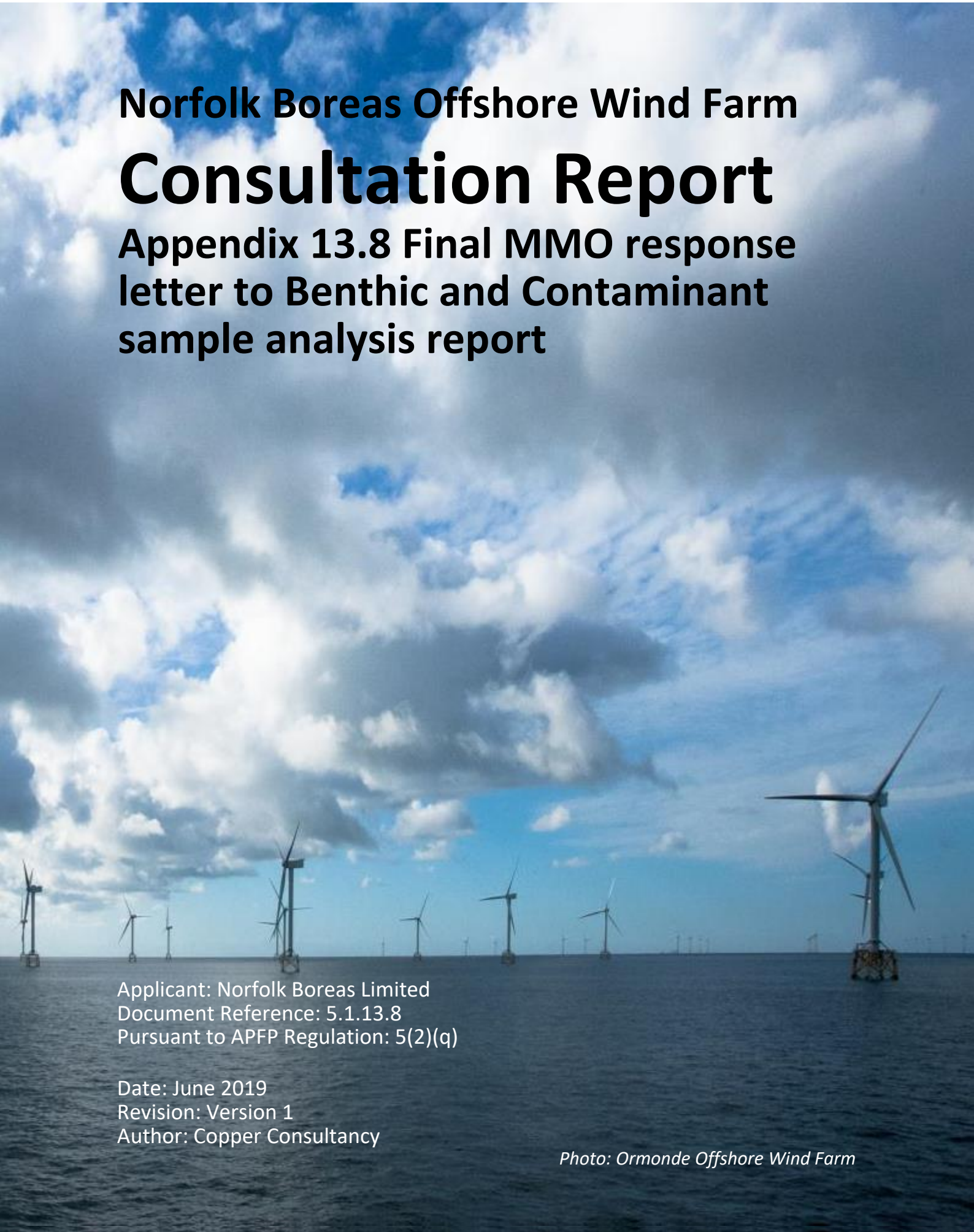
Norfolk Boreas Offshore Wind Farm

Consultation Report

Appendix 13.8 Final MMO response letter to Benthic and Contaminant sample analysis report



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Our reference: DCO/2017/00002

19 December 2017

Dear Mr Tarrant,

Norfolk Boreas Offshore Wind Farm – Pre-Consent Benthic and Contaminant Survey

As part of a review of the updated Benthic and Contaminant Sample Analysis Report for the proposed Norfolk Boreas Offshore Wind Farm, the Marine Management Organisation (MMO) has undertaken a second round consultation with its primary advisors and stakeholders.

In response, please find below the MMO's point by point comments in Appendix 1 for your consideration.

In summary, and relating to your original question if further sample analysis should be undertaken, the MMO can confirm that all additional analyses have been undertaken as requested and it was identified that the sediments are similar between the Zonal Environmental Appraisal (ZEA) survey and the survey completed in 2017. It is therefore that the MMO can confirmed that no additional sample collection is required.

Furthermore, the MMO is content that the updated contaminant report characterises the sediment quality of the array sufficiently to assess the risks posed by the release of contaminated sediments during construction and would expect the final ES to assess the risks related to the re-suspension of surficial sediments. Again, the MMO can confirm that no additional sample collection is required.

If you require any other information, please do not hesitate to get in contact.

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Yours sincerely,

[redacted]

[redacted]
Marine Licensing Case Officer

[redacted]
[redacted]

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Appendix1:

TKOWF comments	MMO comments
The PSA data was not available when the 10 benthic samples were selected for analysis. Advice from Natural England was that the geophysical data should be used to position the samples to represent the different habitats within the site. Early analysis of the geophysical data was used to both inform the locations of the 35 samples in the field and then further analysis of the geophysical data was used to select the first 10 samples for analysis. PSA data for all 35 samples is now presented in the report as Appendix 4 and a Multivariate Analysis comparing PSD data from the Norfolk Boreas survey with the ZEA samples collected from within the Norfolk Boreas site is presented in section 3.4 of the report. The main findings of which are that the sediment remains unchanged from that sampled during the ZEA surveys. Regardless of the findings of the PDS Analysis the infaunal multivariate analysis shows the benthic infaunal communities remain the same across the Norfolk Boreas site as demonstrated in the version F01 of the report and therefore changes in PSD are largely irrelevant.	We acknowledge inclusion of the PSA data and are content that the sediments are similar between the two time periods. Both sediment and faunal data is required to confirm temporal stability within the Array. The analyses provided in the original report (F01) was not sufficient to confirm this. However, further analyses confirm temporal similarity for both sediments and fauna.
Further analysis has been conducted which focuses solely on samples which have been collected from within the Norfolk Boreas site (in 2011 and 2017). Section 3.3.2 presents a cluster analysis which is illustrated with the resultant dendrogram. A 35% similarity slice has been used which was informed by SIMPROF routine. The dendrogram and MDS plots still contain over 100 samples and therefore the stress on a 2-Dimensional MDS plot remains relatively high (0.24). A 3-Dimensional MDS plot is also presented. The infaunal communities across the two data sets are very similar and therefore in the opinion of the applicant this additional analysis provides further evidence that the ZEA data remains appropriate for use within the Norfolk Boreas EIA.	We acknowledge that the infaunal communities are similar between the two time periods following further analyses.

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Cefas were not present at the Norfolk Boreas meeting in February. The meeting was attended by Alan Gibson and Ellie Nobel from the MMO and Alex Thompson and Louise Burton from Natural England. Minutes can be provided on request. As outlined above the report now includes an analysis of the ZEA samples which were collected from the within the Norfolk Boreas site and the Norfolk Boreas survey. For the EIA however it will be important to characterise the entire ZEA along with the new samples. This will allow identification of any communities within the Norfolk Boreas site that are distinct or different from the surrounding area. The SIMPROF routine has been used to identify that 35% as a suitable slice of similarity between groups. ANOSIM has also been performed which failed to identify any significant difference between the communities from the different surveys. As outlined above the stress values remained high; this is partially due to the large volume of samples and large extent of the area over which they were collected from (726km2).	Acknowledged. We agree that the wider characterisation is important to include within the EIA. The request for additional analyses was directly related to confirming the similarity between samples taken within the Array. Analyses, excluding the 'background noise' of the wider area, was needed to ensure that samples were clustering with those taken from within the Array and not separately from the Array samples. This was requested to confirm that the ZEA data are still temporally relevant to characterise the Array for the EIA.
This was part of the mitigation employed to ensure that the survey itself did not impact on Annex 1 reef *Sabellaria* reef. The following was agreed with Natural England by email correspondence on the 17th May, prior to the survey commencing. *"A drop-down video survey will take place prior to any grab samples being taken. The live feed will be used to check for presence of Annex 1 Sabellaria spinulosa reef. If following the live review of the drop down video footage Sabellaria reef of a high "reefiness" score as defined by Gubbay 2007* http://jncc.defra.gov.uk/pdf/405web.pdf *is suspected then a single grab sample may be taken to help determine the height and abundance of the reef to further support the 'reefiness' scoring. If for whatever reason the grab is considered unsuccessful, no further grabs should be taken at that sampling location but any observations noted*" Therefore the Gubbay 2007 classification was used to help define what should be classified as reef to ensure that no undue impact occurred.	We acknowledge that this was previously agreed with NE specifically for survey mitigation purposes.
This was done using the live video feed onboard the survey vessel as part of the mitigation outlined above. An assessment of the presence and predicated extent of Annex 1 reef will be included in the full survey report which will be presented to the Benthic Ecology ETG (which includes the MMO and Natural England) in February.	Acknowledged

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Work is ongoing to determine the presence and extent of Sabellaria reef structures across the Norfolk Boreas site. This will use the Side Scan Sonar and Multibeam Echo Sounder Data as well as further detailed analysis of the drop down video footage. The full benthic survey report containing the findings of this work will be available in early 2018 at which point it will be presented to the Benthic Ecology ETG (which includes the MMO and Natural England) under the Norfolk Boreas Evidence Plan Process. We look forward to working with Natural England and MMO as advised by CEFAS to consider and agree the appropriate mitigation measures for this projects.	Acknowledged
There has been a misinterpretation, the potential reef was classified by eye using the Gubbay 2007 criteria from the video footage. This was done as part of the agreed (with Natural England) mitigation for limiting the impacts of the survey on any Sabellaria reef. If Annex 1 reef was suspected from the video drop only one attempt was to be made at acquiring a grab sample	All additional analyses have been undertaken as requested. Previous surveys have shown the presence of *S. spinulosa* aggregations within the Array. As work is still on going to determine the 'reefiness' of these areas, The MMO would encourage the inclusion of mitigation within the licence to ensure reef will be avoided in the event it is confirmed present.
Due to time constraints, both because of the potential degradation of the contaminant samples and the need to keep to programme, the samples had to be selected prior to full PSA data being available. Full PSA data has been made available sooner than originally expected and this is provided in the latest version (F02) of the report, this shows the sampling strategy was effective and provides good coverage. Other techniques such as waiting for the final PSD results are far more time consuming and so prohibitively costly. The Applicant is of the opinion that the 10 samples analysed thus far do sufficiently characterise the site for the purposes of an EIA for an offshore wind farm, especially given the level of contaminant sampling which has been conducted in support of similar EIAs and the homogeneity of the sediments across the Norfolk Boreas site. For example the single sample that was used to characterise the consented East Anglia THREE site and the six samples used to characterise the Norfolk Vanguard OWF sites. Boreas exhibits similar physical characteristics to these sites and therefore the baseline survey has been proposed within the boundaries of sediment sampling agreed with the MMO and Cefas on other projects	The query specifically stated 'visual sediment type' as it was understood that the full PSA was not available. Descriptions of the sediment are typically recorded in the field on a sample log and it was this field description which was being requested. The level of contaminant sampling above that of previous OWF applications is acknowledged. However it should be noted that where information is supplied, even when above and beyond what may be required, the quality of that information must still be robustly reviewed so that the Regulator (the MMO) can make robust decisions. In the revised report (F02) the PSA statistics (mud/sand/gravel percentage) are provided for all the samples. This shows that the samples selected for contaminant testing are generally those with a greatest mud content. The obvious exception is sample ST32 (with a 20.46% mud) which had the highest mud content but was not tested for contaminants. The MMO is however content that the samples chosen adequately characterise the sediment contaminants of the area.

In response to the Norfolk Boreas Scoping report the MMO provided the following *"The impacts from contaminants may be scoped out depending on the results of 2017 surveys. Survey stations for contaminant analysis should be targeted in the muddier areas, as indicated from previous survey data and UK SeaMap/British Geological Society (BGS) map. (http://jncc.defra.gov.uk/ukseamap) Appropriate gear must be used to sample for contaminants, for example, Day grab or Shipek grab and not Hamon grab. If contaminant levels are similar to those found at reference stations then contaminants can be scoped out."* In the applicant's opinion samples have targeted the finer sediment, were collected using appropriate sampling equipment (as agreed in the answer to Question 1 above) and are similar, or less contaminated than those found at other adjacent windfarm development sites within the former East Anglia THREE zone including Norfolk Vanguard for which assessments indicated minimal risk to water quality with respect to sediment resuspension. Therefore, the case will be made in the Norfolk Boreas Marine Water and Sediment quality Method Statement that impacts from contaminated sediment can be scoped out of the EIA.	Our comment related to the lack of definition around the nature of the works. Having reviewed the scoping report (e.g. sections 2.3.2, 2.7.2) and can see that the assessment concerns the re-suspension of sediment (It is therefore presumed this does not include dredging and disposal, it is also presumed that the assessment concerns only surficial sediments). The MMO agrees that the sampling evidence demonstrates minimal sediment contaminant. The MMO suggests that 'Release of contaminated sediments' is not scoped out of the EIA as this will be relevant to the decommissioning stage, however the MMO is content that the evidence collected is sufficient to assess the risk.
A comparison against the CALs has been the standard agreed method used in all other EIAs for offshore windfarms that we are aware of including those within the former East Anglia Zone. The main reason being that the OSPAR background levels are very limited in terms of the contaminants they cover, particularly metals. For example, arsenic (the only contaminant to register above CALs is not available in the OSPAR background levels. The applicant has used the Cefas action levels in line with other offshore wind farm EIAs to provide an indication of risk to the environment as would be undertaken during decisions regarding suitability of material for offshore disposal. Therefore the Cefas action levels are still relevant to the offshore environment as the risks during offshore disposal are similar to those in relation to any sediment disturbance during construction of an OWF. The assessment does not provide a conclusion regarding a quantitative impact calculation, more it acts as a trigger regarding the requirement for further assessment should levels be significantly elevated. Finally, comparison against the CALs was the method proposed in the Norfolk Boreas Scoping Report and there was no response in the scoping opinion that disagreed with this approach.	Cefas Action Levels (CAL) are not necessarily applicable for general assessments as they indicate generalised levels of sediment contaminants which may be acceptable to dispose of at *designated offshore disposal sites*. Where significant sediment disturbance during offshore works is anticipated, the levels of acceptable contamination needs to be considered in context with the local environment (for example if there are any receptors of particular sensitivity). An assessment of whether the measured contaminants reflect natural background levels (where background levels exist) would have been beneficial in this regard as where contaminants are at natural background levels there is rarely a cause for concern. The MMO am however content that the data presented do not show evidence of any significant contamination which would pose a risk to the environment if temporarily mobilised.

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The Laboratory methods used will be presented in the final survey report which will be appended to the Method Statements provided to the ETG for consultation in February 2018. However, as the applicant has employed the Environment Agency's National Laboratory Service, which is one of the few laboratories which has been accredited by the MMO for marine licence sediment analysis, the methods are deemed to be acceptable to Cefas.	Acknowledged.