

East Anglia ONE North Offshore Windfarm

Appendix 7.1 Marine Geology, Oceanography and Physical Processes Consultation Responses

Environmental Statement Volume 3

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Table of Contents

7.1 Consultation Responses	1
1.1 Introduction	1

Appendix 7.1 is supported by the tables listed below.

Table Number	Title
Table A7.1.1	Fish and Shellfish Consultation Responses

Glossary of Acronyms

Cefas	Centre for Environment Fisheries and Aquaculture Science
DCO	Development Consent Order
DML	Deemed Marine Licence
EA2	East Anglia TWO
EA1N	East Anglia ONE North
ES	Environmental Statement
ETG	Expert Topic Group
HDD	Horizontal Directional Drilling
IFCA	Inshore Fisheries Conservation Authority
IPMP	In Principle Monitoring Plan
MMO	Marine Management Organisation
MCZ	Marine Conservation Zone
NE	Natural England
PEIR	Preliminary Environmental Information Report
SPR	ScottishPower renewables

Glossary of Terminology

Applicant	East Anglia TWO Limited.
Development area	The area comprising the Onshore Development Area and the Offshore Development Area
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one offshore construction, operation and maintenance platform, inter-array cables, platform link cables, up to one construction operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia ONE North windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
Offshore cable corridor	This is the area which will contain the offshore export cables between offshore electrical platforms and transition bays located at landfall.
Offshore development area	The East Anglia TWO windfarm site and offshore cable corridor (up to Mean High Water Springs).

7.1 Consultation Responses

7.1.1 Introduction

1. This appendix covers those statutory consultation responses that have been received as a response to the Scoping Report (2017), the Preliminary Environmental Information Report (PEIR) (2019) and Expert Topic Group (ETG) Meetings.
2. The aforementioned consultation responses that are addressed in this appendix relate to ES Chapter 7 Marine Geology Oceanography and Coastal Processes.
3. As Section 42 consultation for the proposed East Anglia ONE North project was conducted in parallel with the proposed East Anglia TWO project, where appropriate, stakeholder comments which were specific to East Anglia ONE North, but may be of relevance East Anglia TWO, have also been included in the consultation responses for East Anglia TWO.
4. Responses from stakeholders and regard given by the Applicant have been captured in **Table A7.1.1**.

Table A7.1.1 Consultation Responses Related to Chapter 10 Fish and Shellfish Ecology

Consultee	Date/ Document	Comment	Response / where addressed in the ES
The following comments were received prior to consultation on the PEIR and were in response to the Scoping Report or direct consultation with stakeholders. These comments were taken into account in the production of the PEIR			
Cefas / MMO	09/09/2017 Method Statement Response	Concern with methodology used to assess the impact on sensitive receptors, both from a single windfarm and cumulatively, of a change in the wave regime.	In consultation with Cefas and the MMO through ETG meetings, a methodology which was transparent and robust was developed and used in the assessment. See Appendix 7.2 and section 7.7.1 .
Cefas / Natural England / MMO	09/09/2017 Method Statement Response	The list of impacts outlined in the method statement to be included in the ES is appropriate with the following caveats: <ul style="list-style-type: none"> Operational suspended sediment as a result of vertical turbulence. Physical impacts to nearby SPA supporting sandbanks. Suspended sediment due to cable installation works through SPA supporting sandbanks.	Increase in suspended sediment created by scour is covered in section 7.6.2.4 . Physical impacts (tidal currents and waves) are assessed in sections 7.6.2.1 and 7.6.2.2 . Suspended sediment due to cable installation is covered in sections 7.6.1.3 and 7.6.1.5 .
Cefas / MMO	09/09/2017 Method Statement Response	The impact of spudcan marks on the sea bed from jack-up vessels should be assessed in the constructional phase.	The impacts of penetration by jack-up vessels is included in section 7.6.1.7 . This includes the impact of spudcan marks.
Cefas / MMO	09/09/2017 Method Statement Response	The impact of cable protection measures on the sediment transport patterns and pathways should be assessed in the Operational phase. Specifically, this related to rock dumping on intra-array and export cables which could stand 2m proud of the seabed over considerable distance (normally addressed in a Depth of Burial/Cable Protection Plan reports).	The impact of cable protection during the operational phase is assessed in section 7.6.1.7 . As part of the DCO submission a suite of outline documents providing indicative

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			monitoring and management measures will be provided including the In Principle Monitoring Plan (document reference 8.13) which sets out the proposals for monitoring of marine geology, oceanography and physical processes impacts see section 7.3.2 .
Cefas / MMO	09/09/2017 Method Statement Response	Is it proposed to address Scour issues with a Scour Management plan report?	The extent to which scour management will be required will be determined post consent following the detailed technical design. A Scour Protection and Cable Protection Plan will be submitted post consent.
Natural England	08/12/2017 Scoping Response	NE acknowledges that further surveys will be carried out within the inshore areas of the export cable corridor to further inform the sediment composition.	Noted
Natural England	08/12/2017 Scoping Response	Due to the common nature of sand banks, sand waves and megaripples in this area, any future environmental assessments should determine the likelihood or necessity for sand wave clearance in relation to the construction and operation of any windfarm assets.	An impact assessment has been undertaken to determine the impact on sea bed formations, including sand waves, sand banks and mega ripples (see section 7.6.1). The impact assessment considers impacts from construction activities such as levelling and dredging, as well as impacts caused during the operational phase by the presence of physical infrastructure.
Natural England	08/12/2017 Scoping Response	Natural England notes that some of the data is now considered 'old' and collected from the overall East Anglia zone; therefore we advise that further consideration is given to the ability to potentially repeat these surveys post	The approach to benthic data use and collection, and the suitability of the ZEA data to inform the PEIR was agreed with NE and MMO at the ETG meeting of the 19 th of April 2017 and

Consultee	Date/ Document	Comment	Response / where addressed in the ES
		construction should any changes be noted. A (visual) representation of how much data has been collected would be useful to fully quantify it.	subsequent Method Statements (see Appendix 2.1 of SPR 2017). It was agreed that given the nature of the sediment and benthic habitats in the East Anglia ONE North windfarm site and nearby vicinity that the use of ZEA survey data for the windfarm site and parts of the offshore cable corridor where available was sufficient. New data has been collected from previously un-surveyed areas of the cable corridor.
Natural England	08/12/2017 Scoping Response	The importance of focussing on the bathymetric data collection within the proposed array areas should not be underestimated. More site specific data will allow a larger data set to be collected and provide a further robust baseline, but also post construction to monitor any potential effects of the windfarm, if required.	New side-scan sonar, bathymetric data and sediment contaminant data has been collected within the East Anglia ONE North windfarm site (see section 7.4.2)
Natural England	08/12/2017 Scoping Response	NE should also be consulted upon regarding the extent to which scour management will be required, particularly within any protected sites.	Worst case scenarios have been assumed within the assessments as defined in the Chapter 6 Project Description .
Natural England	08/12/2017 Scoping Response	Has the resuspension of contaminants from dredging been considered?	This has been considered as part of Chapter 8 Marine Water and Sediment Quality .
Natural England	08/12/2017 Scoping Response	There needs to be sufficient justification provided when proposing to use additional scour protection, particularly in a soft sediment dominated habitat. Careful placement of scour protection also needs to be considered as to not further encourage scour along the cable route, especially where there is obvious sand wave movement. Every effort should	Cables would be buried wherever possible and it is not anticipated that scour protection would be required for cable laid in soft sediment areas. Scour protection requirements are clearly outlined in Chapter 6 Project Description .

Consultee	Date/ Document	Comment	Response / where addressed in the ES
		be made to bury the cable to the required depth in the first instance.	
Natural England	08/12/2017 Scoping Response	Changes to the sediment transport regime due to the presence of the foundation structures; although the formation of turbid wakes is further understood, their potential effect on benthic ecology and thus recruitment and food availability should be fully assessed. Particularly as monopole foundations continue to increase in size.	This has been considered in section 9.6.4.2 of Chapter 9 Benthic Ecology .
Marine Management Organisation	07/12/2017 Scoping Response	The MMO suggests that, until the results of the cumulative wave assessment have been produced, transboundary effects during operation should be scoped in for consideration in the PEI.	Transboundary effects have been scoped out following cumulative wave modelling and subsequent agreement through ETG meetings (Appendix 7.3).
Marine Management Organisation	07/12/2017 Scoping Response	It is suggested that a section addressing the impacts of climate change on the structures, cable and infrastructure is included in the Marine Geology, Oceanography and Physical Processes chapter of the PEI.	The effects of climate change over the relatively short design life of the proposed development would not be significant in the context of natural variability in baseline conditions. Sea-level rise is a slow progressive factor that will have more measurable effects over timescales of 50+ years (see Section 7.5.10).
Environment Agency	08/12/2017 Scoping Response	The PEI should include a section on landfall physical processes. With regards to the baseline reporting, a lot of work has already been completed on this as part of the Sizewell C scheme. It would make sense to use this data if possible to help make the most informed decision.	The landfall baseline environment and potential effects have been informed by analysis of data kindly provided by the Environment Agency and EDF. Section 7.5.8 "Shoreline Transport Pathways and Coastal Erosion" covers landfall physical processes.

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The Planning Inspectorate	20/12/2017 Scoping Response	It is not agreed that transboundary effects may be scoped out for the operational phase, since the presence of the foundation structures could cause changes to the wave regime, the impacts of which could extend beyond the site of the Proposed Development and this has not been addressed in the Scoping Report.	Transboundary effects are scoped out following cumulative wave modelling (Appendix 2.1 in SPR (2017) and Appendix 7.3).
The Planning Inspectorate	20/12/2017 Scoping Response	The Inspectorate advises that consideration should be given to the potential for impacts on the Orford Inshore recommended Marine Conservation Zone. If it is concluded that there could be significant impacts this receptor should be included in the assessment and the scope agreed with NE.	The implications of changes in physical processes on other topics (e.g. benthic ecology and fish and shellfish ecology) are assessed in Chapter 9 Benthic Ecology and Chapter 10 Fish and Shellfish Ecology .
The Planning Inspectorate	20/12/2017 Scoping Response	Paragraph 83 of the Physical Processes MS (of the Scoping Report) explains that the cumulative impact assessment of East Anglia ONE will be undertaken on the basis of 102 wind turbines being present. The Inspectorate is aware that the authorised DCO for East Anglia ONE includes permission for up to 240 wind turbines. The cumulative impact assessment within the ES should address this position and explain how this has been taken into consideration ensuring a robust assessment is undertaken for each aspect chapter.	For the East Anglia ONE project, the previous modelling assessed a worst case of 240 wind turbines. This confirmed no significant effect on the wave climate. The Zonal Cumulative Impact Assessment, covering development across the whole former East Anglia Zone, concluded that potential cumulative impacts on the wave regime were not significant. The cumulative wave modelling undertaken for the present study adopted a realistic worst case of 102 wind turbines (see Appendix 2.1 of SPR (2017)). Additionally, this issue was discussed with Cefas who were content with using the planned rather than consented envelope.
The following comments were made in response to the PEIR and were taken into account in the production of this ES			

Consultee	Date/ Document	Comment	Response / where addressed in the ES
Marine Management Organisation	22/03/2019	The MMO believes the wording in Section 7.7.3 Paragraph 336 needs amending for stricter accuracy. It can be said that the predicted changes to tidal and wave regime may not be detectable and therefore be judged as insignificant, however it is not appropriate to use this to justify the automatic assumption that there will be no effect. It is therefore recommended the assessment should indicate instead that there is no known mechanism for this to cause significant effect in the sediment system.	Paragraph 336 of this chapter (now 339) has been updated accordingly.
Marine Management Organisation	22/03/2019	It is also noted in Section 7.3.4. that Outline Management Plans will be submitted with the DCO application and will contain key principles to provide the framework for any monitoring that may be required. It is recommended that future monitoring regarding bathymetric surveys should include pre and post- construction surveys of sufficiently wide area, to ensure that changes to bedforms such as sand waves are within the spatial and temporal range presumed in the Environmental Impact Assessment (EIA).	Noted. Pre and post-construction bathymetric surveys will be conducted as part of the agreed In Principle Monitoring Plan (IPMP) (Document reference 8.13). This will be a pre-works requirement as secured under the requirements of the draft DML.
Marine Management Organisation	22/03/2019	Calculations in Chapter 6 and subsequent chapters should be reviewed and corrected as necessary. For example, the MMO notes the estimated drill arisings per monopile is stated as 7953m ³ in section 6.5.4.4.4. paragraph 102, however in Chapter 7, table 7.3, the estimated drill arisings for the same size monopile is 7952m ³ .	This was a rounding error. This has been corrected to 7952.16m ³ .
Marine Management Organisation	22/03/2019	Where required, potential impacts have been assessed using suitable modelling studies. Data sources have been listed in Table 7.4.2, however, other data sources are missing and should be fully referenced e.g. suspended	Changes have been made to paragraph 132 of this chapter and references added. An

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		sediment concentrations. To provide a more detailed baseline, approximate regional suspended sediment concentrations can be obtained from the Cefas Suspended Sediment Climatology model at https://www.cefas.co.uk/cefas-data-hub/doi/monthly-average-non-algal-suspended-particulate-matter-concentrations/	additional paragraph (133) has also been added regarding the Cefas data.
Marine Management Organisation	22/03/2019	It is noted in section 7.6.1.4, paragraph 197 (EA1N), that further information will be provided regarding the extent of sand wave levelling following further geophysical surveys. It is expected that subsequent documents submitted will be updated with the latest data acquired to support a thorough assessment of the works.	Noted and as above, information regarding the extent of sand wave levelling will be provided as part of the agreed Construction method Statement which will be a pre works requirement as secured under the conditions of the draft DML.
Suffolk Coast and Heath AONB Partnership	25/03/2019	The AONB Partnership consider that ScottishPower Renewables should be required to demonstrate that their proposals will not adversely impact on the Coralline Crag or soft cliffs, recognised features of the AONB designation.	An early site investigation report has been appended (Appendix 4.6 Coastal Processes and Landfall Site Selection) for ES Chapter 4 Site Selection . This is a desk based assessment which carefully considers the history and status of the Coralline Crag and Sizewell cliffs. This has been factored into the selection of an optimum location for the landfall at the southern end of the offshore cable corridor at the coast. ES Chapter 7 Marine Geology Oceanography and Coastal Processes further assesses the potential impact on both the Coralline Crag and Sizewell cliffs.

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			It is likely that the HDD pop-out location will be to the south of the outcrop of Coralline Crag (see section 7.6.2.7 of this chapter). Hence, there will be no interruption of the circulatory sediment transport pathways between the coast and Sizewell Bank.
Environment Agency	26/03/2019	We have reviewed this chapter in respect of cable landfall. We welcome the commitment referenced at 7.3.2.6, to use horizontal directional drilling (HDD) for coastal landfall installation to negate potential impacts on flood and coastal erosion risk management interests.	Noted.
Environment Agency	26/03/2019	Considering impacts; we agree with the conclusion of 'no change' in respect of 7.6.1.8 Impact 8 (Changes to Suspended Sediment Concentrations and Coastal Morphology during construction at the Landfall). We also agree in respect of operational impacts that Impact 7 (Morphological and Sediment Transport Effects due to Cable Protection Measures for Export Cables) & Impact 8 (Morphological Effects due to Cable Protection Measures at the Export Cable Landfall) present low/negligible impact and no impact on coastal flood and erosion risk management interests, as stated in sections 7.6.2.7 & 7.6.2.8.	Noted.
Historic England	26/03/2019	It is stated that increased erosion that may be experienced in the area surrounding each turbine will be mitigated either through the implementation of AEZs for A1 anomalies, and micro-siting for A2 and A3 anomalies (paragraphs 181 & 182 (EA1N) and paragraph 178 (EA2)). The latter approach will need to carefully consider the evidence obtained from the	This comment has been addressed for ES Chapter 16 Marine Archaeology and Cultural Heritage . Please refer to Appendix 16.3 for response.

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		pre-construction surveys that are planned, as well as the limitations in the approaches used and the data that will be collected. In addition, the impact that changes to coastal processes may have on heritage assets needs to be discussed in more detail. Heritage assets are briefly mentioned in Table 7.43 (EA1N & EA2) in the Marine Geology, Oceanography and Physical Processes chapter (Ch7), but the details of the embedded mitigation strategy set out in this chapter needs to be discussed with heritage in mind (either in Chapter 7 or in Chapter 16), such as the use of scour protection (Chapter 7.6.2.4 (EA1N & EA2)). It is stated in Section 7.3.4 that monitoring will form a major part of the management strategy (paragraph 63 (EA1N) and paragraph 64 (EA2)), but again this would need to consider heritage assets.	Further consideration regarding heritage assets has been added to ES Chapter 16, specifically section 16.3.3 embedded mitigation.
Natural England	26/03/2019	There needs to be a greater consideration of the impact of development on the nearby Orford Inshore proposed MCZ (pMCZ). As a pMCZ this site is now a material consideration and although there is no overlap with the development area it should be factored into the impact assessment and a separate MCZ assessment carried out to rule out any significant indirect affects upon the interest features of the site.	New paragraph (139) has been added to the ES chapter which considers the now designated Orford Inshore MCZ based on the assessment undertaken for East Anglia THREE.
Natural England	26/03/2019	This chapter does not consider the impact of development on the nearby Orford Inshore pMCZ. As a pMCZ this site is now a material consideration and although there is no overlap with the development area it should be factored into	As above.

Consultee	Date/ Document	Comment	Response / where addressed in the ES
		the impact assessment to rule out any significant indirect affects upon the interest features of the site.	
Natural England	26/03/2019	Although the cable corridor does not overlap with any designated sites for sea bed features SPR acknowledges the cable corridor is adjacent to sand banks which are a supporting feature of the Outer Thames Estuary SPA. These sandbanks need to be mapped and the impact of cable installation on them needs to be considered further.	Sandbanks have been considered and paragraph 138 has been updated accordingly to signpost to this assessment. These features have been considered within the assessment of effects on the 'Suffolk' Natura 2000 site. Impacts from cable installation are concluded as minor adverse to negligible significance (paragraph 222 of this chapter).
Natural England	26/03/2019	Table 7.4 "Summary of Realistic Worst Case Scenarios for Wind Turbine Foundations." The 'Whole Windfarm Site' column should attempt some estimation of area. It currently just repeats text from 'Individual Wind Turbine' column. This seems to be an error.	Table 7.4 (now Table 7.3) has been updated for all type of effects with areas. Due to the nature of the effect and unsuitable metric, 'Blockage' has not been updated with an area.
Natural England	26/03/2019	The worst case scenario of up to 10 % of the cables requires cable protection seems large. How was this estimate reached? (i.e. what is the estimate that up to 10 % of the length of cables would be unburied based on?)	Worst case cable protection has been refined to 5%. This reduction was based upon experience of cable installation on East Anglia ONE. Paragraph 49 of this chapter has been updated accordingly.
Natural England	26/03/2019	To mitigate the effects on marine geology, oceanography and physical processes, a minimum separation of 800m has been defined between adjacent wind turbines within each row and a minimum spacing of 1,200m has been defined between rows in order that the potential interactions between adjacent wind turbines are minimised. – What are the distances of 800 m and 1,200 m based on? Is there	Section 7.3.3 of this chapter has been updated. Minimum turbine separation is not considered to be mitigation but is part of the wider project design requirements.

Consultee	Date/ Document	Comment	Response / where addressed in the ES
		some research that has been done which shows that these distances allow for the continuation of natural physical processes, but positioning turbines closer together may interrupt these natural systems?	
Natural England	26/03/2019	For other foundation types, where the scour potential involves smaller volumes of sediment release due to scour processes, the design would, where feasible to do so, allow for local scour around the piles to minimise the scour protection footprint that is introduced on the sea bed. – The introduction of scour protection should be minimised as far as possible.	Noted. The Applicant is committed to minimising scour protection where possible.
Natural England	26/03/2019	What is the maximum depth of 5 m based on? 1-2 m is the usual quoted maximum depth for cable burial associated with offshore windfarms.	Worst case burial depth has been refined to 3m. Paragraph 59 of this chapter has been updated to provide rationale for maximum 3m cable burial depth. Minimum cable burial depth is 1m however this may vary depending on outcome of pre commencement geophysical surveys.
Natural England	26/03/2019	The East Anglia TWO windfarm site and offshore cable corridor does not overlap with any international, national or local sites designated for sea bed features. – Although this statement is correct, and Natural England agreed at the screening stage that European designated sites could be screened out, the Orford Inshore pMCZ is now considered a material consideration and is in relatively close proximity to the cable corridor. The impact of the development on the designated features of this site should be considered.	The MCZ has been included in Table 7.10 of this chapter. A new paragraph (139) has been added to section 7.5.9 of this chapter which considers the impact of the development on designated features of the Orford Inshore MCZ.

Consultee	Date/ Document	Comment	Response / where addressed in the ES
Natural England	26/03/2019	Table 7.11 needs to include Orford Inshore pMCZ and should be considered further in the assessment.	As above.
Natural England	26/03/2019	7.5.9 Designated Sites - Orford Inshore pMCZ needs to be considered further in this section.	As above.
Natural England	26/03/2019	Para. 168 (EA2 and EA1N) This value is notably less than worst case scenario for EA2, is it not possible to repeat the model based on the EA2 scenario? What is this value likely to be?	The reference to East Anglia ONE modelling was to demonstrate the principle that has been applied to the qualitative assessment. There is no intention to repeat the modelling since the effects are not envisaged to directly impact the identified receptor groups. This is now paragraph 170 in this chapter.
Natural England	26/03/2019	Need to consider the impact of increased sedimentation on the subtidal mixed sediment feature of Orford Inshore pMCZ.	A new paragraph (139) has been added to section 7.5.9 of this chapter which considers the impact of the development on designated features of the Orford Inshore MCZ.
Natural England	26/03/2019	Due to proximity of the East Anglia ONE windfarm site to the 'non designated sand banks' receptor group and also the Galloper Offshore Windfarm site, wave height reductions of up to about 5% were observed under the largest storm events considered at these locations. These were not considered to be significant impacts by the East Anglia ONE assessment (either alone or cumulatively with Galloper). Changes under lesser magnitude events were not noticeable at the 'non designated sand banks' receptor group or the Galloper site. What is the assumption of no significant impact based upon?	The threshold change in wave height for no significant effect upon the baseline wave regime was agreed at 5% by Cefas as part of the Expert Topic Group (ETG) and subsequent wave modelling briefing note that was submitted in November 2017. MMO provided a response to this briefing note on the 15 th November 2017 where they agreed with the approach.

Consultee	Date/ Document	Comment	Response / where addressed in the ES
Natural England	26/03/2019	In areas of active sediment transport, any linear protrusion on the sea bed may interrupt bedload sediment transport processes during the operational phase of the proposed project. There is unlikely to be any significant effect on suspended sediment processes since armoured cables or cable protection works are relatively low above the sea bed (a maximum of 1m), except in areas where the cable crosses other sub-marine infrastructure (e.g. pipelines and cables) where it may extend to a height of up to 4m. Where has the assumption that 1 m is low and will not have a significant effect on sediment transport come from? Is there a reference for this?	1m is considered low in relation to the height of sand waves (where present) and these features would pass over the cable protection. In other areas of sea bed, any entrapment of sediment would be limited and sediment transport would occur by ramping over the cable protection with only local and limited scale effect.
Natural England	26/03/2019	Table 7.35 - Orford Inshore pMCZ should be considered here.	A new paragraph (139) has been added to section 7.5.9 of this chapter which considers the impact of the development on designated features of the Orford Inshore MCZ.
Natural England	26/03/2019	7.6.3. Para. 318 (EA2), Para. 317 (EA1N) Export cables would be left in situ, but what about cable protection? There should be a plan in place to consider removing this.	It is assumed that cable protection will be left in situ. This may be revisited at decommissioning.
Natural England	26/03/2019	7.11 para. 344 (EA2), Para. 345 (EA1N) Further consideration of the Orford Inshore pMCZ is required.	A new paragraph (139) has been added to section 7.5.9 of this chapter which considers the impact of the development on designated features of the Orford Inshore MCZ.
Suffolk Coastal District Council	26/03/2019	Seek further information regarding coastal processes associated with the cable landing point.	SCC and SCDC have been engaged and consulted regarding the cable landing point. Further information on the cable corridor and how coastal processes may be affected is in

East Anglia ONE North Offshore Windfarm
Environmental Statement

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(SCDC) and Suffolk County Council (SCC)			Appendix 4.6 Coastal Processes and Landfall Site Selection for ES Chapter 4 Site Selection .
Suffolk Coastal District Council and Suffolk County Council	26/03/2019	SPR identified that the coastline's main uncertainty is in terms of longer change in coastal processes and therefore has committed to setting back the landfall transition bays to the potential 100 year erosion prediction line. It is stated the ducts would be installed with a setback distance of a minimum of 85m from the cliff top. The Councils welcome a precautionary approach to uncertainty over erosion risk in all aspects of design.	Noted.
Suffolk Coastal District Council and Suffolk County Council	26/03/2019	The use of Horizontal Directional Drilling (HDD) as opposed to open cut excavation is preferred. Notwithstanding this, the Councils have some residual concerns regarding the potential for HDD to create vibration that may cause local destabilisation of the coastal cliffs above. We require SPR to assess this risk including reference to experience at other sites where HDD has been used under granular cliffs. The Councils also require SPR to report on those findings and if a potential for negative impacts is found, SPR should present options for avoidance or mitigation.	Construction methods such as HDD have been incorporated into the appraisal of constraints and engineering feasibility study. This feasibility study has considered destabilisation risks and has been informed by previous project experience. This is described further in the site selection process presented in ES Chapter 4 Site Selection and Assessment of Alternatives .
Suffolk Coastal District Council and Suffolk County Council	26/03/2019	SPR has stated that the HDD exit location area would be to the south of the Coralline Crag where it is anticipated that the sea bed sediment would be suitable for cable burial. The depth of the HDD at landfall must take account of both short term shoreline variability and long term change trends together with an allowance for variability and tolerance in vertical alignment during installation. The consultation	Noted.

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		documents have highlighted that further geophysical survey and engineering investigations will be necessary prior to confirmation of a final cable installation location or construction method. The Councils require SPR to share the outcomes and consequences of the further investigations referred to with stakeholders as soon as they are available. Our objective is to avoid significant changes to the design intent and detail as presented to date.	
Suffolk Coastal District Council and Suffolk County Council	26/03/2019	SPR has committed to burying as far as possible, the offshore export cables which will help to minimise the need for surface laid cable protection which could affect the movement of sediment along the coastline. The Councils have encouraged SPR to choose cable routes that minimise the risk of significant damage to the Coralline Crag outcrop which comprises a key coastal control feature. We are satisfied that SPR's approach to their cable route option assessments to date has been objective and robust.	Noted
Suffolk Coastal District Council and Suffolk County Council	26/03/2019	In relation to decommissioning, SPR has stated that the nearshore cabling will only be removed if there is a risk of cables being exposed overtime but the transition bays would be left in-situ. The Councils believe it is preferable for all cabling and ducting in the nearshore area and the landfall transition bay to be removed as part of the decommissioning process to avoid the consequences of future shoreline change.	Noted
Suffolk Coastal District Council and	26/03/2019	The Councils are satisfied that the assessment of potential site specific and cumulative impacts of windfarm groups on coastal processes is robust and that a 2% worst case	Noted

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Suffolk County Council		change is unlikely to produce a significant negative impact. We would require this assumption to be kept under review as part of future impact monitoring programmes.	
National Trust	21/03/2019	The National Trust is concerned that a lot of design information which could impact upon coastal processes is not yet known or has not been shared with the public. This includes the number of wind turbines, the layout configuration, type of foundations for the turbines, the number of off-shore platforms, the need for scour protection, dredging for cable laying and cable protection measures. On the one hand the documents indicate that these issues may not be known until sometime after the DCO has been granted, yet on the other it is stated that specific mitigation, if required will be identified through the EIA which would be submitted with the application. The Trust considers that this is a fundamental issue and decisions on these matters along with any mitigation must be clearly articulated in the EIA and made available at the time of the DCO application in order that full consideration can be given by third parties.	<p>A worst case scenario of the design has been detailed and described in section 7.3 of this chapter 'Scope'.</p> <p>This forms the 'Rochdale Envelope' which allows a project description to be broadly defined, within a number of agreed parameters, for the purposes of a consent application.</p>
National Trust	21/03/2019	The Trust wishes to see assessments that properly evaluate the impact that this development will have on the coast. The timeframes should have regard to construction, operation and decommissioning. The coastline is made of soft, mobile and erodible material that is and will continue to alter over that timescale and the assessment should take account of change with predicted climate change and sea level rise. The Trust wishes to see the evidence that the timeframes and nature of geomorphological change have been properly	Effects of the development on the coast have been assessed in detail. These assessments have been summarised in section 7.6 of this chapter. They are supported further by the assessment of coastal processes in Appendix 4.6 Coastal Processes and Landfall Site Selection for ES Chapter 4 Site Selection , which considers the history and current status

Consultee	Date/ Document	Comment	Response / where addressed in the ES
		assessed, evaluated and presented so we may fully understand the impact on the coastline.	of local sediment transport and coastal erosion along the cliffs.
National Trust	21/03/2019	Future climate change may lead to significant changes in the source of storms, their direction, and magnitude. This may all alter the direction and magnitude of processes compared to the present day (or recent historical) conditions and need to be evaluated for the longer-term change and how the development will interact with those future changed conditions.	Climate change has been considered in terms of set back distance at the cliff and burial depth for cables. This will be further refined through the engineering design.
National Trust	21/03/2019	Monitoring shingle and sand movement is notoriously difficult. The Trust is interested to see the proposals for how long-term change will be monitored to ensure any accelerated or variability in response to the development is picked up and impacts mitigated. It must be ensured that the monitoring and mitigation for coastal processes is robust, covers the construction, operation and decommissioning phases and secured through a legal agreement.	In the absence of significant impacts, monitoring is not required.
National Trust	21/03/2019	The documents indicate that Outline Management Plans (across a number of environmental topics) will be submitted with the DCO application. These will contain key principles that provide the framework for any monitoring that could be required. It is stated that the requirement for and final appropriate design and scope of monitoring will be agreed with the relevant stakeholders and included within the relevant Management Plan, submitted alongside a suite of certified consent discharge documents, prior to construction works commencing. The National Trust considers that this information should be determined prior to submission of the	A worst case assessment is presented in the ES and supporting DCO documents. The purpose of consent discharge conditions is to allow for best and latest available scientific information to be provided prior to the commencement of construction. It also allows for finalisation of the project design. The relevant competent authorities will be consulted on these plans.

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		DCO application and included with the application. The Trust wishes to be one of the stakeholders consulted on these Management Plans.	
National Trust	21/03/2019	<p>The National Trust is concerned about the cumulative impact of East Anglia TWO in combination with other planned major infrastructure on the Suffolk Coast. This includes on-shore and off-shore development.</p> <p>Of particular concern are the existing and proposed East Anglia Offshore Wind Arrays, the proposed nuclear power station at Sizewell C and two interconnectors to Belgium and the Netherlands by National Grid Ventures. This is in addition to Sizewell A, Sizewell B and the Galloper and Greater Gabbard off-shore windfarms which already exist.</p> <p>The Trust has the following concerns and requests that these are covered in SPR's assessment:</p> <p>Any interaction between on and off-shore infrastructure and impacts on geomorphology, sediment migration and coastal processes;</p>	<p>A cumulative assessment with other major infrastructure is provided in Section 7.7, Table 7.39 of this chapter. Sizewell C was scoped out of cumulative assessment. based on minimal marine works for that project (see section 17.3.3, 17.5.8 and 17.6 of Chapter 17 Infrastructure and Other Users and Section 3 of Appendix 4.6 Coastal Processes and Landfall Site Selection) and cable corridor siting south of Sizewell.</p> <p>Galloper and Greater Gabbard were scoped in and cumulatively assessed.</p> <p>The National Grid Ventures interconnectors are not on the Planning Inspectorate Register of Applications and are therefore not considered in line with Planning Inspectorate Advice Note 17 Cumulative Effects Assessment</p>
Aldringham-cum-Thorpe Parish Council	20/03/2019	<p>Coastal Processes</p> <p>The landfall location is situated at a point on the coast with a very fragile cliff frontage. Therefore, it is essential that the cable ducts and the transition bays associated with the joining of the onshore and offshore cables are installed with a suitable setback distance to allow for natural coastal erosion. The proposed cable ducts from the transition bays</p>	<p>Set back at cliff and burial of cables has been considered. This will be further refined through the engineering design. Worst case scenarios have been assumed within the assessments as defined in Section 6.3 of Chapter 6 Project Description.</p>

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		out to sea must be of sufficient depth so that the vibration caused by the HDD drilling and work associated with their installation and with subsequent operation do not affect the fragile cliffs.	An assessment of coastal processes and considerations for landfall has been appended (Appendix 4.6 Coastal Processes and Landfall Site Selection) for ES Chapter 4 Site Selection . This is a desk based assessment which carefully considers the history and status of the Coralline Crag and coastal erosion.
EDF Energy	20/03/2019	Any development offshore, as ScottishPower Renewables need to demonstrate that physical compatibility of its projects would have no adverse effects on the future operations of Sizewell C. This needs careful investigation prior to submission of the applications. We would like to work with you to understand any potential impacts and develop a way forward that would not impact Sizewell C.	Section 3 of Appendix 4.6 Coastal Processes and Landfall Site Selection describes potential impacts on Sizewell C's cooling water Intakes and Outfalls with respect to coastal processes. This was an early stage report which recommended various mitigation measures which fed into the site selection process outlined in ES Chapter 4 Site Selection . The landfall location and offshore cable corridor routing has been optimised so that landfall is made in the southern portion of the proposed offshore development area. This has increased the distance between the source of the impact and the potential receptor. The Applicant will continue to engage with EDF Energy in order to establish an appropriate 'no development' buffer zone from Sizewell infrastructure.
Eastern IFCA	12/03/2019	CAB1 Using cable armouring instead of burial increases the likelihood of adverse environmental and fisheries impacts. If	This is also a concern of the Applicant and the intention is to bury cable where possible. The worst case scenario of 5% unburied export

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		<p>cables are left unburied, the presence of exposed export cable can result in snagging of fishing gear. Aside from damage to cables, this poses a significant safety risk, particularly for small vessels operating in the area, and could result in semi-permanent exclusion of fishing activities from the area. This is therefore a concern for Eastern IFCA.</p> <p>Recently, Eastern IFCA have become aware of offshore wind farm developments that have required application for additional cable reburial/remedial works from those anticipated when the licence was first granted. Evidence has shown that cables are resurfacing primarily due to sediments that are unsuitable for cable burial not providing sufficient hold for the cable. This has resulted, in some cases, in extensive lengths of cable resurfacing with snagging hazards for vessels fishing in the area and repetition of the impacts caused to sensitive habitats through the reburial of exposed cables. Eastern IFCA would like to highlight that events of this nature have the potential to cause significant impacts on both habitats and commercial fisheries, therefore we would request that careful consideration is applied prior to establishing the exact cable route and method of burial.</p>	<p>cable and 10% unburied inter-array and platform link cable is intended for assessment purposes only.</p> <p>A Scour Protection and Cable Protection Plan will be submitted post consent. This will incorporate proposals for monitoring offshore cables, including cable protection, during the operational lifetime of the authorised scheme. This includes a risk based approach to the management of unburied or shallow buried cables.</p>

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