Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects

Applicant Response in Regard to S42 Comments

August 2022
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Glossary of Acronyms

BDC	Broadland District Council
CSCB	Cromer Shoal Chalk Beds
DCO	Development Consent Order
DEFRA	Department for the Environment and Rural Affairs
DEP	Dudgeon Offshore Wind Farm Extension Project
DOW	Dudgeon Offshore Wind Farm
EIA	Environmental Impact Assessment
EPP	Evidence Plan Process
ES	Environmental Statement
ETG	Expert Topic Group
HVAC	High-Voltage Alternating Current
HVDC	High-Voltage Direct Current
KM	Kilometre
LPA	Local Planning Authority
MCZ	Marine Conservation Zone
MEEB	Measures of Equivalent Environmental Benefit
MW	Megawatts
NNDC	North Norfolk District Council
NCC	Norfolk County Council
NorCC	Norwich City Council
NSIP	Nationally Significant Infrastructure Project
OTNR	Offshore Transmission Network Review
OWF	Offshore Wind Farm
PEIR	Preliminary Environmental Information Report
SEP	Sheringham Shoal Offshore Wind Farm Extension Project
SNC	South Norfolk Council
SNS	Southern North Sea
SoS	Secretary of State
UK	United Kingdom
WTG	Wind Turbine Generator

Glossary of Terms

Dudgeon Offshore Wind Farm Extension site	The Dudgeon Offshore Wind Farm Extension offshore lease area.
Dudgeon Offshore Wind Farm Extension Project (DEP)	The Dudgeon Offshore Wind Farm Extension site as well as all onshore and offshore infrastructure.
DCO boundary	The area subject to the application for development consent, including all permanent and temporary works for DEP and SEP.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive. This includes candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas, and is defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the EIA and HRA for certain topics.
Expert Topic Group (ETG)	A forum for targeted engagement with regulators and interested stakeholders through the EPP.
Horizontal directional drilling (HDD) zones	The areas within the onshore cable route which would house HDD entry or exit points.
Interlink cables	Cables linking two separate project areas. This can be cables linking: • DEP South and DEP North • DEP South and SEP • DEP North and SEP 1 is relevant if DEP is constructed alone or first in a phased development. 2 and 3 are relevant in an integrated construction.

Landfall	The point at the coastline at which the offshore export cables are brought onshore and connected to the onshore export cables.
Offshore export cables	The cables which would bring electricity from the offshore substation platform(s) to the landfall. 220 – 230kV.
Offshore scoping area	An area that encompasses all planned offshore infrastructure, including landfall options at both Weybourne and Bacton, and allows sufficient room for receptor identification and environmental surveys. This has been refined following further site selection and consultation.
Offshore substation platform	A fixed structure located within the wind farm area, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore.
Onshore cable corridor	The area between the landfall and the onshore substation sites, within which the onshore cable circuits will be installed along with other temporary works for construction.
Onshore export cables	The cables which would bring electricity from the landfall to the onshore substation. 220 – 230kV.
Onshore Substation	Compound containing electrical equipment to enable connection to the National Grid.
PEIR boundary	The area subject to survey and preliminary impact assessment to inform the PEIR.
Separated Grid Option	Transmission infrastructure which allows each project to transmit electricity entirely separately.
Study area	Area where potential impacts from the project could occur, as defined for each individual EIA topic.
Sheringham Shoal Offshore Wind Farm Extension site	Sheringham Shoal Offshore Wind Farm Extension lease area.
Sheringham Shoal Offshore Wind Farm Extension Project (SEP)	The Sheringham Shoal Offshore Wind Farm Extension site as well as all onshore and offshore infrastructure.
The Applicant	Equinor New Energy Limited.

Transition joint bay	Connects offshore and onshore export cables at the landfall. The transition joint bay will be located above mean high water.

1 Policy and Legislative Context

Consultee	Comment	Development Change?	Project Response
North Norfolk District Council	Chapter 3 - Policy and Legislative Context The contents of this chapter are noted including national and local policies. In respect of local context and relevant policies and documents for North Norfolk, reference at paragraphs 106 and 107 to a draft Landscape Character Assessment (LCA) and Landscape Sensitivity Assessment (LSA) need to be updated to reflect that these documents are now adopted as Supplementary Planning Documents (SPD) – Jan 2021.	No	Comment noted and reference to the Landscape Character Assessment (LCA) and Landscape Sensitivity Assessment (LSA) has been updated **ES Chapter 2 Policy and Legislative Context** (document reference 6.1.2).

The Wildlife Trust	Chapter 3: Policy and legislative context Paragraph 93 East Marine Plan Information must be provided on how the project will impact Objective 6, 7 and 8 and Policy BIO1 and BIO2 of the East Marine Plan to allow the Secretary of State to consider in his assessment. TWT would welcome a discussion on how Policy BIO2 could be implemented as part of the project: “Where appropriate, proposals for development should incorporate features that enhance biodiversity and geological interests.”	No	Relevant sections of The East Inshore and East Offshore Marine Plan to SEP and DEP can be found in **ES Chapter 2 Policy and Legislative Context** (document reference 6.1.2).

2 Site Selection and Assessment of Alternatives

Consultee	Comment	Development Change?	Project response
Norfolk Coast Partnership	Onshore construction compounds Woodforde Farm is unsuitable - too far from route and substandard access.	Yes	Woodforde Farm has not been taken forward as the main construction compound location. **ES Chapter 3 Site Selection and Assessment of Alternatives** (document reference 6.1.3) contains a summary of the main compound site selection process. Full details of the main compound site selection process can

			be found in **ES Appendix 3.3 Onshore Main Construction Compound Site Selection Report** (document reference 6.3.4.3).
Cadent Gas Limited	Please note the presence of a high pressure gas pipeline in close proximity to the proposed development. The pipeline has a 3m building proximity distance (BPD). No buildings including footings and overhangs are permitted within 3m of the pipeline. Landscaping 3m either side of the pipeline is also restricted and must have formal written approval from Cadent Gas before commencing. The developer is to engage with plantprotection@cadentgas.com before commencing any works on site. The high pressure pipeline is classed as a 'Major Accident Hazard High Pressure Pipeline' therefore the application will need to be put through the HSE LUP process to confirm if the proposal is acceptable. Please note there are intermediate pressure gas pipelines in close proximity to the development. No buildings are permitted to be sited within 3m of the pipeline. This includes footings and building overhangs. The developer is to contact Cadent Gas to ensure all setting out on site will conform to this requirement. Trial holes will be required to confirm the location of the pipeline. These are to be carried out by the developer with Cadent Gas in attendance to monitor the works.	No	The Applicant is committed to ongoing engagement with Cadent and if required will seek to agree and has included Protective Provisions for inclusion in within Development Consent Order in order to protect Cadent's apparatus.

National Grid	Access Route to Proposed Substation NGET object to the proposal to access the proposed onshore substation through the NGET Norwich Main Substation. Our objection to the proposal to use the substation access for construction and post construction access is as follows: Impacts on existing operational site traffic, access, and safety requirements of the substation and other occupiers of the land; Impacts on other NGET committed and programmed works including but not limited to essential substation upgrade and maintenance works, substation extension works and essential outage and maintenance works required for the transmission network; Impacts on the local road network and accessibility to the Norwich Main substation from the wider highway network which is required 24/7.	Yes	The Applicant has continued to engage with National Grid on the use of the existing National Grid access. In order to address National Grid's concerns additional means of access to the onshore substation have been included for within the DCO boundary to the north and west of Norwich Main substation. Other measures such as improvements to the existing access and vehicle holding areas have also been proposed. The SEP/DEP operational access is proposed to be via the existing National Grid access. However, SEP/DEP operational traffic would only be required for planned maintenance – equivalent to one light goods vehicle visiting the site per week.
North Norfolk District Council (NNDC)	Many of the choices and influences in relation to site selection are beyond the immediate control or influence of NNDC. The grid connection offer and selected landfall location are ultimately determinative in how the project evolves. NNDC can understand why Weybourne was chosen as preferred landfall destination ahead of Bacton	No	Noted.

	given the technical complexities of landfall location near to the Bacton Gas Terminal.		

NNDC	NNDC recognise that the final cable route within the identified route corridor area will be refined further as the project moves towards DCO consent stage. There will be an expectation from NNDC that the route is refined and options chosen (e.g. avoiding removal of important trees and hedgerows and other interest features) and use of HDD under features where no other satisfactory re-routing alternative is available. This is important so as to minimise the impact of the project both during the construction phase and also in terms of the longer term impacts associated with constraints above laid cables.	Yes	Throughout the site selection process and associated consultation, the onshore cable route presented at the PEIR stage has been refined to a width of 60m for the DCO application, increasing to a width of 100m for trenchless crossing zones, such as main rivers and A roads. The Applicant has committed to at least 62 trenchless crossings across the entire route, which have been included to avoid numerous features including main rivers and ecologically sensitive hedgerows with trees. Important trees and hedgerows are detailed in the **ES Appendix 20.15 - Arboricultural Report** (document reference 6.3.20.15) and the **Tree Preservation Order and Hedgerow Plan** (document reference 2.12).

Oulton Parish Council	Oulton Parish Council have in the past voiced concerns that the continuing use of RAF Oulton and the ever-increasing length of temporary uses for industrial purposes, may well leave the community with a legacy issue.	Yes	The main construction compound option at RAF Oulton was dropped by the Applicant between the PEIR and final ES stage, primarily in response to traffic concerns raised by the local community. The preferred option is located on the A1067 near Attlebridge.
Swainsthorpe Parish Council	We would hope that onshore substation be situated as close to the existing substation as possible and that current access to the substation acts for both facilities. This will avoid weak bridges and take advantage of existing screening.	Yes	Site 1 has been selected as the preferred location of the onshore substation. This site was selected due to its close proximity to the Norwich Main Substation. During construction the preferred onshore substation access will be via the existing National Grid access to Norwich Main Substation. Additional access routes are proposed for the construction phase only. These are described within the **Outline Construction Traffic Management Plan** (document reference 9.16). The operational access is proposed to be via the existing National Grid access.

Swainsthorp-e Parish Council	Whilst we would advocate for the substation to be built immediately adjacent to existing sub station further north, dramatically minimising the environmental impact, if it were necessary to choose between the two sites proffered we would hope the one with the least negative impact upon the landscape and environment be pursued. Despite being on higher ground site 2 to the west appears to be closer to existing electrical infrastructure and hence appears to be the obvious choice.	Yes	Site 1 has been selected as the preferred location of the onshore substation. This site was selected due to its close proximity to the Norwich Main Substation and the naturally low lying ground reducing potential visibility. A key consideration was also the increased archaeological significance of the area proposed for Site 2. **ES Chapter 3 Site Selection and Assessment of Alternatives** (document reference 6.1.3) contains a summary of the onshore substation site selection process and full details can be found in **ES Appendix 3.3 Onshore Main Construction Compound Site Selection Report** (document reference 6.3.4.3).
Swardeston Parish Council	Onshore Substation Site 2 would have a significantly greater impact as regards noise and disruption to local residents and users of recreational paths during substation construction, which could extend to anything from 4 to 7 years. Once complete, a substation at Site 2 would have a significantly greater visual impact on local residents and those using the nearby footpaths and bridle roads for the next 35+ years. Site 2 has been noted as containing a number of valuable heritage	Yes	Substation Site 1 has been selected as the preferred location of the onshore substation. This site was selected due to its close proximity to the Norwich Main Substation and the naturally low lying ground reducing potential visibility. A key consideration was also the increased archaeological significance of the area proposed for Site 2. **ES**

	assets which would inevitably be impacted or lost as a consequence of construction at that location.		**Chapter 3 Site Selection and Assessment of Alternatives** (document reference 6.1.3) contains a summary of the onshore substation site selection process and full details can be found in **ES Appendix 3.1 Onshore Substation Site Selection Report** (document reference 6.3.4.1)
The Wildlife Trust and Norfolk Wildlife Trust	Chapter 4: Site Selection & Assessment of Alternatives Table 4-1 It would be helpful for the project to also consider statements made by BEIS in the recently published Energy White Paper (December 2020).	No	An updated table is included in **ES Chapter 3 Site Selection and Assessment of Alternatives** (document reference 6.1.3) to show how consideration has been given to the BEIS Energy White Paper (BEIS, 2020), both in relation to offshore wind capacity targets and UK Government commitments to protecting the environment.
The Wildlife Trust and Norfolk Wildlife Trust	Chapter 4: Site selection & Assessment of Alternatives Paragraph 16 TWT are broadly supportive of coordination of cabling to reduce environmental impacts. We would like further information on how using an integrated approach to electrical infrastructure will reduce the amount of infrastructure needed in the onshore and offshore environments, with comparisons of onshore and offshore footprints through the use of integrated vs. separated grid options.	No	**ES Chapter 4 Project Description** (document reference 6.1.4) describes the differences between construction scenarios. Additionally, within each technical ES chapter, the worst case scenario for each impact is presented and an assessment undertaken for each construction scenario.

			Specifically, an integrated grid option would: Favour a concurrent build, which would reduce the duration of construction and overall levels of environmental impact and disruption. Reduce the total number of OSPs from two to one.
Natural England	Volume 1 Chapter 4 Site Selection and Assessment of Alternatives Table 4.2 Scoping Opinion, Natural England, Comment 3rd Bullet Point – Note NE asked for confirmation that the removal of Race Bank Extension from the current leasing round will not open up possibility that SEP might extend outside the scoping area as currently drawn (i.e. in the direction of the current Race Bank wind farm). 6th Bullet Point – density maps of the bird features in the GWSPA should have been considered in particular the density map for RTD. The shortest ECR does not necessarily minimise the potential impact of the project, even if it does minimise the footprint within the SPA. Recommendations Further clarity should be provided on these matters within the Environmental Statement (ES).	No	As noted under the scoping comments, the Applicant confirms that the boundaries of the proposed SEP wind farm site have not extended from those presented at the scoping stage. Densities of red-throated diver in this particular region of the Greater Wash SPA are relatively low, with the highest densities in the SPA (>3 birds per km^2) being found further to the north and west (Lawson et al, 2016). The mean density across the entire SPA is 0.36 birds per km^2. Within the export cable corridor presented at PEIR plus a 2km buffer, the modelled density of red-throated diver within the area of the Greater Wash SPA is between 0.07 birds per km^2 and 0.51 birds per km^2, with an

			average of 0.24 birds per km^2. Therefore, it can be said that the siting of the export cable corridor minimises the impact on red-throated divers by avoiding areas of the highest density and below the mean density of the SPA.
Natural England	Volume 1 Chapter 4 Site Selection and Assessment of Alternatives Section: 16, Bullet Point 2 Comment Key project design decisions that have been made: • Selection of the landfall at Weybourne with an ECC through the western portion the MCZ. • Recommendations: The Applicant needs to expand with details of whether the option for exploring the export cable route through the SAC was revisited.	Yes	The Applicant was advised by Natural England to route the offshore export cable corridor to avoid The Wash and North Norfolk Coast SAC in order to avoid Annex I habitats within it. The unfavourable condition status of the SAC was a factor in avoiding the SAC, but not the only one. The chosen route presents the shortest cable route overall (and so minimises the footprint of cable installation) and has the additional and distinct advantage of being close and parallel to the existing Dudgeon OWF export cable route, for which Equinor has first-hand experience of undertaking successful cable burial works. The latter is considered in detail in the **Outline Cromer Shoal**

			Chalk Beds (CSCB) Marine Conservation Zone (MCZ) Cable Specification, Installation and Monitoring Plan (CSIMP) (document reference 9.7).
Natural England	Volume 1 Chapter 4 Site Selection and Assessment of Alternatives Section: 16. Bullet Points 3 & 4 Comment Key project design decisions that have been made: · ≤100m external cable protection per export cable in the MCZ. Recommendations Further to our response to the MEEB proposals (20 April 2021), neither Dudgeon nor Sheringham Shoal OWFs required cable protection. Therefore, we would encourage the development of design and installation measures that will increase the likelihood of successful burial. The aim should be to develop a project with sufficient confidence that the cables can be buried, and thus remove the need for cable protection. Otherwise the project design should only consider cable protection options that are mostly likely to be successfully decommissioned i.e. not rock armouring	No	The Applicant has reduced the worst case external cable protection requirements within the MCZ as far as possible (100m per cable) and has used available information from the existing Dudgeon and Sheringham Shoal OWFs to achieve this. Furthermore, the Applicant has undertaken further geotechnical survey in 2021 to help inform the cable burial proposals, as reflected in the **Outline CSCB MCZ CSIMP** (document reference 9.7). The Applicant has also committed to using external cable protection systems in the MCZ that are removable on decommissioning (further details in the **Outline CSCB MCZ CSIMP,** document reference 9.7).

Natural England	Volume 1 Chapter 4 Site Selection and Assessment of Alternatives Section: 17 / Table 4-3 Comment Natural England re-iterate their preference for integrated construction options which significantly reduce ecological impacts for these projects. Recommendations Consideration should be given to installing infrastructure in both projects at the same time e.g. ducts	No	As described in **Chapter 4 Project Description** (document reference 6.1.4) a sequential with pre-investment (where either SEP is constructed first and installs the ducts for DEP, or DEP is constructed first and installs the ducts for SEP) is provisioned for within the **Draft DCO** (document reference 3.1) Noted. This option would result in an overall shorter construction duration than the sequential scenario and would result in lower overall peaks during construction than the concurrent scenario. As it does not reflect the maximum peak effects or maximum duration of effects it has not been assessed as a specific scenario but is covered by the envelope of parameters considered.
Natural England	Volume 1 Chapter 4 Site Selection and Assessment of Alternatives Section: 4.8.2 Comment The Weybourne ECR north of the Cromer MCZ is approximately 500m wide, widening to approximately	No	Noted. Please refer to responses provided above.

	1km wide upon entering the Cromer MCZ, and widens again towards the landfall area. Similar for the Bacton option. Recommendations Natural England advises that every effort should be made to minimise the area of impact within the Cromer Shoal Chalk Beds (CSCB) MCZ.		
Natural England	Volume 1 Chapter 4 Site Selection and Assessment of Alternatives Section: 4.8.3.1 Comment Would an ECR passing through The Wash and North Norfolk Coast SAC have a greater detrimental effect than through the Cromer MCZ, or vice versa? Recommendations Please provide further analysis of this matter.	No	The impact pathways would be the same regardless of whether the export cable route passes through the MCZ or SAC and therefore this question depends on how the value of the qualifying features compares between the two sites. The Applicant considers the value of the same habitats to be equal across both the MCZ and the SAC and **ES Chapter 8 Benthic Ecology** has been updated to make this clear. However, as already stated, the unfavourable condition of the SAC was one factor considered at the time that the decision was made to route the export cable corridor through the MCZ. Other key factors include that this presents the shortest and most direct route to

			landfall (reducing the overall level of disturbance) and has the additional and distinct advantage of being close and parallel to the existing Dudgeon OWF export cable route, for which Equinor has first-hand experience of undertaking successful cable burial works. This increases the confidence in the SEP and DEP cable installation and burial works being undertaken successfully.
Natural England	Volume 1 Chapter 4 Site Selection and Assessment of Alternatives Section: 4.8.3.1 Comment Sheringham Shoal post-construction surveys 'showed likely recovery within two years in most areas (Fugro, 2013). By August 2020, epifaunal community structure along the export cable corridor had recovered such that it was not significantly different to unimpacted areas.' Recommendations The 2020 Sheringham Shoal post- construction survey relied purely on photographical surveys of the ECR trench. This provided only close-up imagery of the epifaunal communities, which is not sufficient to fully	No	The Applicant understands that the most recent geophysical and bathymetric surveys have been provided to Natural England for comparative purposes. Text has been added to **Section 4.8.3.1** of **ES Chapter 3 Site Selection and Assessment of Alternatives** (document reference 6.1.3) to make it clear that the 2020 Sheringham Shoal post-construction survey was undertaken using video transects. The potential limitations of the survey are noted in the survey report. The methodology was agreed with Natural England prior to the survey and was aimed at

	assess changes in species abundance/distribution, habitat form/function and sediment composition along the ECR between sampling periods. The 2020 Sheringham Shoal post-construction benthic survey should, therefore, have also included the most recent geophysical and bathymetric surveys for comparative purposes to provide information on these issues i.e. whilst the cable trench may have infilled, there still remains a depression in the impacted areas compared to the unimpacted areas. Furthermore, seabed sediment thickness cannot be gauged through underwater imagery alone, as was the case in the 2020 post-construction benthic survey. This would again have required accompanying geophysical/bathymetric survey data for validation and to calculate changes in sediment layer thickness. Moreover, the recent sedimentary processes study in the CSCB MCZ (April 2020), concluded that where the coarse lag is present along the Sheringham Shoal ECR, the trenches in which the ECs sit are visible on the post-construction seabed. This implies that the coarse lag is not mobile and sediment transport processes are insufficient to infill the trenches at these sites. Conversely, it is at the mobile seabed sites along the ECR (comprising Holocene sand areas or across Pollard Bank), where the trenches have infilled with sediment and the original trenches are no longer visible. Therefore, the statement made in Point 46 is an		demonstrating whether there were any differences in epifaunal communities between impacted and unimpacted areas. The survey did not aim to provide information on whether the impacted areas (visible from the geophysical data as trenches on the seabed) had recovered in terms of their physical form, as the existence of the trenches had already been identified from the geophysical data, and was used to inform the locations of the video transects. The Applicant understands that the geophysical surveys at Sheringham Shoal are ongoing and will provide further information on the physical recovery of the impacted areas of seabed, as may be required. The Applicant considers that the results of the video transect surveys, which confirmed no significant differences in epifaunal communities between impacted and unimpacted areas, are highly relevant in terms of understanding the ecological implications of seabed impacts from

	incomplete one and is thus is not considered sufficient to draw robust conclusions from.		cable installation in the Cromer Shoal Chalk Beds MCZ.
Natural England	Volume 1 Chapter 4 Site Selection and Assessment of Alternatives Section: 4.8.3.1 Comment 'the Applicant has also committed to a long HDD at the landfall, which at Weybourne completely avoids the subtidal outcropping chalk MCZ feature, this is in a proven location for works of this nature on account of the successful HDD works already carried out for both Dudgeon and Sheringham Shoal OWFs.' Recommendations What does this mean, 'in a proven location for works of this nature'? Without the relevant surveys/assessments, we cannot assume that the HDD works at one location will be the same as those carried previously for Dudgeon and Sheringham Shoal OWFs.	No	**Section 4.8.3.1** of the **ES Chapter 3 Site Selection and Assessment of Alternatives** (document reference 6.1.3) has been amended to address this comment.

Natural England	Volume 1 Chapter 4 Site Selection and Assessment of Alternatives Section: 4.8.3.1 Comment 'Ground investigation data including a geophysical seismic survey and boreholes carried out for Dudgeon OWF' Recommendations Should these data be referenced? If these data are the ones discussed in Appendix 4.2, then reference should also be made to this document.	No	A reference to these data as described in section 2.6 **of ES Appendix 3.2 Cable Landfall Concept Study** (document reference 6.3.4.2) of the has been added to **ES Chapter 3 Site Selection and Assessment of Alternatives** (document reference 6.1.3).
Natural England	Volume 1 Chapter 4 Site Selection and Assessment of Alternatives Section: 4.9.2 Comment "A number of challenging sections currently include....more detailed engineering feasibility work is undertaken . These areas include: · The landfall location at Weybourne; · Weybourne woods; and · North of Cawston" Please expand to explain why Weybourne Woods and the area North of Cawston is more challenging.	No	**Section 4.9.2** of **ES Chapter 3 Site Selection and Assessment of Alternatives** (document reference 6.1.3) has been expanded to include further information on these areas.

Natural England	Appendix 4.2 Section: 6.1 Comment Weybourne West – if the offshore cable laying vessel cannot operate in the depths of water stated, then the profiles may need to be revised to suit the vessel draft. Recommendation Would this therefore be reflected in the Rochdale Envelope, and what could this mean in terms of impacts to the seabed? Please clarify.	No	It is anticipated that during the procurement process, the Applicant would ensure that the contractor's cable laying vessel was able to operate in water depths of 9m at the HDD exit location. However, in the unlikely event that the selected contractor's cable laying vessel was not able to operate in those depths, small changes in the profiles may be required. For example, the length of the HDD (currently assumed to be approximately 1,000m offshore, (see **ES Chapter 8 Benthic Ecology** (document reference 6.1.8)) could be increased but this would not have an influence on the Rochdale Envelope since HDD length is not a material factor in any of the impacts assessed. Additionally, the worst case assumptions for length of export cable permits flexibility in the final location of the HDD exit pit (**ES Chapter 8 Benthic Ecology** (document reference 6.1.8)).
Natural England	Appendix 4.2 Section: 11.2	No	Noted. See the **Outline CSCB MCZ CSIMP** (document reference 9.7) for up to date ground investigation surveys.

	Comment Seabed Works - Cable Duct Installation & Preparation Measures: Once the transition profile has been excavated then temporary protection would be needed to push the duct down onto the seabed and protect it. The level of protection required will need to be determined during detailed design. Recommendation The duration and size of the footprint/impacted area of seabed needs to be considered.		
Natural England	Appendix 4.2 Section: 12.1 Comment The available ground conditions appear suitable for the application of HDD however; further scheme specific ground investigation will be required to confirm the ground conditions and the feasibility of the proposed HDD profiles. The HDD profile should be re-assessed once further ground investigation has been completed and the results reported. Recommendation There is a risk that the ground conditions are not fully understood at this early stage. This matter will need to be revisited in later submissions.	No	As described in the **Outline CSCB MCZ CSIMP** (document reference 9.7), in Q4 2021, the Applicant undertook a geotechnical survey (cone penetrometer testing and vibrocores), including within the export cable corridor as it passes through the MCZ. A survey of this type would usually be undertaken post-consent nearer to the point of construction but has been brought forward in this case in order to provide further information to inform the cable burial studies and the associated environmental considerations. Interpretation of the geotechnical survey results is ongoing. Details of the finalised

			export cable corridor and any necessary micro-siting within the CSCB MCZ will be provided in the final CSIMP, informed by the pre-construction surveys described above, including the 2021 geotechnical investigations.

3 EIA Methodology

Consultee	Comment	Development Change?	Response
Natural England	Comment: Definition of EPP is missing part of the purpose. Recommendation: The EPP also helps NSIP applicants meet the requirements to provide sufficient information in their application, so that the Examining Authority can recommend to the Secretary of State whether or not to accept the application for examination, and whether an appropriate assessment is required.	No	An updated definition of the EPP has been included in the Glossary of Terms in **ES Chapter 5 EIA Methodology** (document reference 6.1.5) .
Natural England	Comment: The primary objective of an EIA. Recommendation: The primary aim of EIA is to protect the environment through the process described in Point 7, but also to ensure that the public are given early and effectives opportunities to participate in the decision-making procedures.	No	Text has been updated in **ES Chapter 5 EIA Methodology** (document reference 6.1.5) (**Section 5.2**) to include reference to the fact that the EIA also provides the public early and effective opportunities to

Consultee	Comment	Development Change?	Response
			participate in the decision-making process.
Natural England	Comment: The purpose of the ES (and this PEIR) is to inform the decision maker, stakeholders, and all interested parties of any significant effects that would result from DEP and SEP during their construction, operation and (where relevant) decommissioning. Recommendation: The PEIR provides information which is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development). Repowering should also be included here. In other words, all stages of the project lifespan.	No	Whilst the eventual life of SEP and DEP may include repowering, the Applicant is seeking to consent SEP and DEP with a 40-year life span and the assessments presented within this ES cover the assessment of impacts associated with that definition. Any repowering would in effect be outside of the consent granted for the projects and would be subject to a separate planning process at that time.
Natural England	Comment: 'for each receptor and potential impact, the impact assessment will be based on assessing project design parameters likely to result in in the maximum adverse effect' Recommendation: This should also refer to potential pathways for change.	No	Source-pathway-effect is discussed in **ES Chapter 5 EIA Methodology** (document reference 6.1.5) (**Section 5.7.2**).
Natural England	Comment:	No	Text has been updated in **ES Chapter 5 EIA Methodology** (document reference 6.1.5)

Consultee	Comment	Development Change?	Response
	A review of the existing environment has been undertaken in order to determine, and agree, the existing environmental conditions in the study area in question. Recommendation: The aim of the characterisation of the existing environment is also to provide a robust baseline to inform understanding of the existing environmental conditions, how the different processes link together and how they evolve in response to applied forces.		(**Section 5.6**) to provide further clarity on the aim of the baseline characterisation.
Natural England	Comment: Impact Significance Definitions. Recommendations: Minor impacts should refer to change throughout the associated project development (i.e. construction/operation and/or decommissioning). Major impact implies change to key environmental characteristics which are well in excess of the natural range of variability, and likely to occur some distance away from the development area. Moderate impact implies change to key environmental characteristics which are in excess of the natural range of variability but largely restricted to the development area. Change occurs throughout associated project development phase. Low impact implies change to key environmental characteristics which are similar to, but occasionally in excess of, the natural range of variability. Change occurs intermittently during associated project development phase and is restricted to the development area.	No	Definitions in **Table 5-6** of **ES Chapter 5 EIA Methodology** (document reference 6.1.5) have been updated to refer to change throughout the associated project development, as recommended.

Consultee	Comment	Development Change?	Response
Natural England	Comment: NE note the Applicant lists a number of outline documents to be submitted, does the Applicant intend to submit one per development, or just one to cover both projects? If it is the latter, how will this be captured and how will differing issues be addressed? Recommendation: Please advise.	No	A single Outline Plan will be produced to provide a framework and the mitigation principles for relevant topics, with a clear indication within it if any proposed mitigation is appropriate to only SEP or DEP, or vice versa. The management plans will be secured through an appropriate requirement in the DCO or condition in the DMLs which will allow for staged working for each project. Final management plans will be produced which are suitable for any given stage of either given project, e.g. the Applicant may discharge multiple management plans which are all in accordance with a common Outline plan.

4 Marine Geology, Oceanography and Physical Processes

Consultee	Comment	Development Change?	Response
Eastern Inshore Fisheries Conservation Authority (EIFCA)	Chapter 8 Marine Geology Oceanography and Physical Processes We note with concern the volumes stated on pages 30/31 "Impact 3: Changes in suspended sediment concentrations due to export cable installation" and question how widespread (spatially) the impact is likely to be and for how long might this impact be present, particularly in relation to commercial and recreational fisheries species of interest?	No	**Section 6.6.4.5** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6) provides an assessment of the potential impact on suspended sediment concentrations. An assessment of the potential impacts of an increase in suspended sediment concentrations on fish and shellfish ecology receptors is provided in **Section 9.6.1.2** and **9.6.2.5** of **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9) which includes consideration of the key commercial species of interest (also see **Section 12.6.1.5** of **ES Chapter 12 Commercial Fisheries** (document reference 6.1.12)). The assessment of how widespread the plume is likely to

			be was based on modelling of the DOW export cable which has similarities in water depth, sediment types and metocean conditions to the SEP/DEP export cable corridor. This makes the earlier modelling studies a suitable analogue for the present assessment (see **Section 6.6.3** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)). The increase in suspended sediment concentrations is expected to be local and short-term. The results indicate that mud-sized material (which represents only a very small proportion of the disturbed sediment) would be advected around 10km to the west and less to the east and persist in the water column for hours to days (within one tidal excursion), with concentrations dropping to less than 1mg/l within a single flood or ebb excursion. Also, although suspended sediment

			concentrations will be elevated, they are likely to be lower than concentrations that would develop in the water column during storm conditions.
MMO	5 Chapter 8. Marine Geology, Oceanography and Physical Processes Observation 5.1 Section 8.4.3 paragraph 33 - 35 clearly distinguishes clearly between direct receptors (e.g morphological features) and also where a change to marine geology, oceanography and physical processes may result in a knock-on effect to a non-physical receptor, which is good practice. 5.2 MMO note that SEP and DEP are being assessed through one DCO application, but flexibility has been retained within the design/Rochdale envelope for them to be developed either in an integrated manner or as separate projects. The joint application approach should facilitate consideration of interactions between the two new proposed projects, so inter-related/cumulative impacts between the two projects has been inherently considered throughout. MMO would support the integrated approach as it would reduce overall effects compared to constructing the projects separately, particularly if it can reduce the number of cables required to pass through the Marine Conservation Zone (MCZ). 5.3 Section 8.3.3 Table 8-4 summarises embedded mitigations in project design. Other mitigation measures are	No	Noted

	detailed in the impact assessment section 8.6.		
MMO	5.4 Preference for removable scour protection in the MCZ is noted. Whilst MMO agree it is preferable to use methods which facilitate/allow removal at decommissioning stage, the potential for degradation of components which would be used for lifting/removal over the project lifetime should be accounted for in decision-making on this matter.	Yes	The **Outline CSCB MCZ CSIMP** (document reference 9.7) provides further information on the potential cable protection requirements and material to be installed within the MCZ.
MMO	5.5 The MMO would like to highlight that if gravity-based structures are selected, there is an option for locally derived sediment (dredged during seabed preparation activities) to be used as ballast. If this option were selected, the impact assessment would need to be updated to consider whether the removal of this sediment would have any impact on sediment transport processes and subtidal geomorphological features, such as Sheringham Shoal sand bank and the Cromer Knolls. Changes to such features may alter hydrodynamics and therefore alter the energy regime and the coastline.	Yes	The potential use of locally derived sediment as ballast within GBS foundations has been removed from the project envelope.
MMO	Changes Required: 5.6 The use of scour protection is proposed in all areas where scour would be predicted to occur, therefore potential impacts from any sediment that would be mobilised due to erosion occurring during scour development is not assessed. The impacts of using scour protection (relating to a greater footprint of hard substrate being introduced, which may lead to habitat change/loss) should be compared to the impacts of simply designing foundations which can	No	Secondary scour effects associated with scour protection would be confined to within a few meters of the direct footprint of that scour protection material, and so the potential impact would be minimal. The loss of habitat due to the direct footprint of the scour protection is

	accommodate scour development. The resulting effects of scour (lowering of the seabed, winnowing/coarsening of sediment, plus release of sediment into the wider environment after installation) may have a lesser impact than compared to the introduction of hard substrate into the environment (particularly given that rock scour and/or cable protection is difficult to decommission).		considered to be worse than the effects of scour without scour protection (or secondary scour). Hence, a scenario with no scour protection is not assessed.
MMO	5.7 The MMO were unable to find an assessment of potential scour depths, as scour protection (as noted above in paragraph 5.6 is proposed for all areas where scour may occur. Secondary scour around the edge of scour and cable protection should be assessed and accounted for in habitat change assessments in other topic chapters as it is likely to increase the overall footprint/area of effect. 5.8 With further regard to secondary scour the MMO consider further evidence should be collected from field data/monitoring evidence from other wind farms if available, although we acknowledge that empirical assessment methodologies are less established for edge/secondary scour than they are for primary scour where no scour protection is applied. Currently, the assertion that "It is likely that any secondary scour effects associated scour protection would be confined to within a few meters of the direct footprint of that scour protection material" is not well supported by evidence or predictive assessment, and it is not clear whether its footprint is factored into project footprint estimates. Further information should be provided to support this.	No	Direct impact from scour protection is assessed as a worst case. Secondary scour effects are not factored into the worst case scenarios for footprints. Footprints for secondary scour are difficult to quantify and not directly comparable in terms of impact pathways to the use of scour protection. Therefore, it is not proposed to include a footprint of secondary scour within the ES assessments. The Applicant has reviewed the SOW and DOW post construction monitoring reports however no information on secondary scour is presented within those. The **Offshore In-Principle Monitoring Plan (IPMP)**

			(document reference 9.5) includes provision for monitoring of secondary scour around scour protection which would be undertaken as part of general engineering and design monitoring procedures.
MMO	5.9 The MMO suggest that it would be beneficial if the baseline sections of Chapter 8 include a location map showing the features discussed in the text compared to the proposed development e.g. Weybourne channels, Bolney Cut, nearby and regional sand banks, other projects, etc.	No	Four new plates (**Plate 6.1** to **Plate 6.4**) have been added to **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6) to show the depths to the base of the two uppermost units across the proposed development (Botney Cut and Bolders Bank Formations) and the position of the Weybourne Channel Deposits along the export cable corridor. The deeper geological units have less relevance.

			A figure showing other projects included as part of the cumulative impact assessment screening has been provided (**Figure 6.14** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)). All sand banks within the DEP wind farm site (there are none in the SEP wind farm site) and along the export cable corridor are mapped bathymetrically (see **Figures 6.1** to **6.4** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)). However, as noted above, an offshore temporary works area has been incorporated within the SEP and DEP offshore sites which does not include geophysical coverage. The Applicant has committed to post consent coverage of the additional areas

			potentially required for temporary works.
MMO	5.10 The MMO consider a precautionary approach to be appropriate given uncertainties around the effects of sand wave levelling on sand bank evolution. The MMO would expect to see greater detail on the extent of areas where sand wave levelling is proposed in relation to these features within the ES. This should be encompassed in determining the magnitude of the effect in Table 8.23 and impact significance in 8.6.4.8.3. Depending on the outcome of this further assessment the contents of Section 8.11 on monitoring proposed may need to be changed.	No	A precautionary approach to the effects of sand wave levelling (pre-sweeping) has already been adopted for cable (infield and interlink) installation. The worst case scenario sand wave levelling volumes are presented in **Table 6-2** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6) for each of the different scenarios and **Figure 4.9** in **ES Chapter 4 Project Description** (document reference 6.1.4) shows the potential locations of

			sand wave levelling. Cross-references to this figure are now included throughout **ES Chapter 4 Project Description** (document reference 6.1.4) chapter. These worst-case parameters and the existing evidence base on sand wave recovery are encompassed in defining the magnitude of effect in **Section 6.6.4.8.3** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6). Monitoring of sand wave recovery following their clearance is included in the **Offshore IPMP** (document reference 9.5).

MMO	5.11 The MMO do not agree with the statement made in Section 8.5.8.1 paragraph 131 that no significant difference was found in sediment composition between the Sheringham Shoal Offshore Wind Farm (SOW) export cable trenches and the control areas adjacent to the trenches. The MMO do not consider that such a strong conclusion can be drawn based on photographic data in the absence of particle size analysis. The MMO suggest this is reworded in the ES to state that results indicated no difference but acknowledge that further evidence would be needed to confirm. If subsequent assessments rely on this assertion, further evidence would be required.	No	The statement in (the original) Paragraph 131 (now Paragraph 140 has been reworded in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).
MMO	5.12 Section 8.6.4.8.1 paragraph 255 states: "The dynamic nature of the sandwaves in this area means that any direct changes to the sea bed associated with sand wave levelling are likely to recover over a short period of time due to natural sand transport pathways." The MMO request further evidence to be presented to confirm that this is the case at this site. The MMO suggest greater discussion including an assessment (see paragraph 5.10 above) of the areas where sandwave levelling will occur and their vicinity to local sand banks and morphological features is needed to provide reassurance there will be no long-term morphological effects due to sand wave levelling.	No	A new Construction Impact 7 (new **Section 6.6.4.9** in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)) has been added to the chapter, which assesses the potential interruptions to bedload sediment transport due to sand wave levelling for offshore cable installation (infield and interlink cables). Evidence has been presented from pre- and post-construction monitoring at Race Bank and a

			sand wave study carried out for the Norfolk Projects. The areas where sand wave levelling could potentially occur are shown on **Figure 4.9** in **ES Chapter 4 Project Description** (document reference 6.1.4). A more detailed discussion of these sand waves and their relationship to local sand banks has been added to the baseline environment (**Section 6.5.1** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)).

MMO	5.13 Further to the above comment (5.12) The PEIR should consider whether there might be impacts on nearby subtidal geomorphological features, e.g. Cromer Knoll, Sheringham Shoal sand bank. Changes to these features may influence the East Anglian Coast and/or MCZ, and therefore they should be considered as a subsection of impact assessment on these receptors, although it could also be appropriate to address them separately as their own receptor group. Any assessments need to consider the potential for direct impacts to sand banks caused by the various impacts identified to lead to indirect effects on receptors. For example, impact 6 “change in sea bed level due to offshore cable installation (infield and interlink cables)” needs to include consideration of whether nearby sand banks and morphological features could be affected by sand wave levelling activities. The MMO consider this is necessary because there is a possibility for sand bank changes to affect wave energy propagation across the site and therefore affect the wave energy at the receptors (similar to wave regime effects resulting from the presence of structures as considered in section 8.6.5.2).	No	A new Construction Impact 7 (new **Section 6.6.4.9**) has been added to **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6), which assesses whether sand bank functionality is affected by sand wave levelling activities.
MMO	5.14 The MMO note that studies on sedimentary processes and geology in the MCZ have been undertaken, although the British Geographical Survey (BGS) study is not included as an appendix to the PEIR, its title indicates it is an interim report. The MMO would welcome sight of the final report during the DCO application process at an appropriate stage.	No	The final BGS report is now included as **ES Appendix 6.4 Sheringham Shoal Nearshore Cable Route – BGS Shallow Geological Assessment** (document reference 6.3.6.4).

MMO	5.15 The MMO recommends that it may be beneficial if the Applicant reviews information and assessments for other projects making landfall through the MCZ e.g. Hornsea 3, as an additional source of information.	No	Noted
MMO	5.16 Section 8.4.4 states that for marine geology, oceanography and physical processes, activities considered to have potential cumulative effects include construction of other OWFs and large coastal defence and protection works. While It may be that there are no other project types in the potential zone of influence, the MMO seek further reassurance that other activities which have potential to impact these receptors or processes have also been considered when screening for projects, e.g. marine aggregate extraction, telecommunications/interconnector cables.	No	Blythe Hub, Viking Link and AGG3 are now included in the list of projects/activities that could potentially have a cumulative impact with SEP and DEP. The potential for cumulative impacts has been assessed through the CIA screening process.

MMO	5.17 Section 8.7.1 states that no cumulative impact assessment is required in relation to marine geology, oceanography and physical processes. At present the MMO do not consider that enough information has been presented regarding the decision-making behind the contents of the "potential for cumulative impact" and "data confidence" columns in Table 8.35, nor that sufficient information regarding the nature of other projects is available in the Chapter to agree with this, and request that further detail and justification is provided.	No	Further justification to show how project screening for CIA was undertaken is now provided in the **Section 6.7** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).
MMO	5.18 The MMO query the Applicant's assertion that "Only potential impacts assessed in Section 8.6 as negligible adverse or above are included in the CIA (i.e. those assessed as 'no impact' are not taken forward as there is no potential for them to contribute to a cumulative impact)." Since effects determined to be insignificant individually can interact with other effects and lead to significant effects. The MMO suggest individual impact magnitude is a better metric on which to screen effects from further consideration.	No	By definition, no impact means that there will be no change to a parameter due to SEP and DEP. Hence, cumulatively, the only impact to that parameter would be from the other project or activity. Hence, there would be no cumulative impact in relation to SEP and DEP. This is standard practice within cumulative impact assessment.

MMO	5.19 The modelling undertaken for SOW and DOW did not have existing nearby wind farms as part of its baseline. The MMO consider further justification is given to provide assurance that modelling undertaken for individual SOW/DOW wind farms encompasses a conservative enough design envelope to account for the four wind farms which will potentially co-exist (DOW, SOW, SEP and DEP) in the area, and where this is uncertain, consider additional specific modelling or consider applying a more conservative approach when drawing conclusions regarding impact significance. As an example, this would apply to operational impact 1, 2 & 3 as identified in Section 8.6.5 of this Chapter.	No	The justification for using the SOW/DOW theoretical work has been updated to include more detail of its use as an analogy for the wind farms co-existing (see **Section 6.6.3** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)). Numerical modelling of waves has now been completed for potential operational impacts due to the presence of the foundation structures. The modelling includes assessment of all four wind farms cumulatively (**ES Appendix 6.2 Wave Climate Assessment** (document reference 6.3.6.2))
MMO	5.20 The MMO would like to see further clarification to confirm that no modelling is needed. MMO note that the Hornsea 2 DCO application undertook a modelling study to determine effects on the wave climate at the shoreline, which has not been employed here, although the MMO acknowledge the wind farm is closer to shore. Please see 5.21 below for further points on this matter.	No	The justification for using the SOW/DOW theoretical work has been updated to include more detail of its use as an analogy for the wind farms co-existing (**Section 6.6.3** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference

			6.1.6). Numerical modelling of waves has now been completed for potential operational impacts due to the presence of the foundation structures. The modelling includes assessment of all four wind farms cumulatively (**ES Appendix 6.2 Wave Climate Assessment** (document reference 6.3.6.2))
MMO	5.21 It is stated that no monitoring is proposed for physical processes, oceanography and seabed geology: this should be considered as further assessment is completed and based on the MMO's comments above and advice during examination.	No	Monitoring of sand wave recovery following their clearance is now included in the **Offshore IPMP** (document reference 9.5).
North Norfolk Coast District Council	Chapter 8 - Marine Geology, Oceanography and Physical Processes NNDC would defer to the advice of Natural England, Marine Management Organisation, Centre for Environment, Fisheries and Aquaculture Science (CEFAS) and other experts in respect of matters within this Chapter of the PEIR.	No	Noted.
Natural England	Summary of Main Concerns for Marine Geology Oceanography and Physical Processes Project Parameters Subject: Project Definition	No	A full suite of geophysical and benthic surveys were completed across the wind farm sites and offshore cable corridors (excluding offshore temporary works areas) at periods between

	Comments: The baseline data provided in this chapter in support of the PEIR is insufficient to adequately inform the assessment of impacts due to the proposed development. Landfall and beach access impacts have not been considered. Not all sensitive receptors have been considered either. Recommendations: Full baseline characterisation should be provided, along with consideration of all impacts and sensitive receptors.		September 2019 and August 2020 to support baseline environment characterisation (**Section 6.4.2.1** in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)). These included bathymetry (multibeam echosounder), sea bed texture (side-scan sonar), shallow geology (sub-bottom profiling), and sea bed sediments/particle size (grab sampling). Landfall and beach access does not form part of the coastal processes assessment. Sand banks have been added as a sensitive receptor. As noted above, an offshore temporary works area has been incorporated within the SEP and DEP offshore sites which does not include geophysical coverage. The Applicant has committed to post consent coverage of the additional areas potentially required for temporary works. See **ES Chapter 4**

			Project Description (document reference 6.1.4) for further details.
Natural England	Comments: It is not clear how some of the worst-case scenario footprints and volumes have been calculated (in this chapter and Chapter 5), nor some of the project parameters, and thus, the rationale behind them. Furthermore, the worst-case scenario does not consider all receptor impacts e.g. changes to the sandbanks, wave shadow (attenuation) effect of the arrays, plume dispersion and seabed change due EC installation along the ECC, and changes to the shoreline. Recommendations: Calculations of project parameters should be clearly defined. The WCS for changes to each receptor should be evaluated. Unless this information is provided then we will be unable to provide our full nature conservation advice and there is a risk that that we will not be able to agree with your conclusions.	No	The worst-case scenarios for Marine Geology, Oceanography and Physical Processes were developed from the Project Design Envelope described in **ES Chapter 4 Project Description** (document reference 6.1.4). They are defined using the Rochdale Envelope approach (**Section 6.3.2.1**) and are the worst-case scenarios for the Marine Geology, Oceanography and Physical Processes parameters that are considered (waves, tidal currents, sediment transport). In terms of impacts, changes to sand banks are now included in the assessment as a new Construction Impact 7 (see **Section 6.6.4.9**). Wave shadow effects of the arrays are implicit in the assessment of changes to waves (**Section 6.6.5.2**); plume dispersion due to export cable

			installation has been covered albeit through analogous studies at SOW and DOW (**Section 6.6.4.5**); sea bed change due to installation of the export cable has been addressed (**Section 6.6.4.6**); changes to the shoreline have been addressed (**Section 6.6.5.6**), although there is no impact because the cable installation at the landfall will be undertaken by long HDD). All sections found in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).
Natural England	Comments: There is significant uncertainty regarding baseline characterisation. In this case (except for some geophysical, bathymetric and sediment sample analysis), no new project-specific data have been collected. Moreover, in addition to the use of data that pre-date the construction of the existing windfarms (DOW and/or SOW), there are data gaps, and a reliance on qualitative assessments. The wave climate has not been adequately characterised for the project area over a range of wave conditions, to understand possible impacts on sediment transport processes. No wave analysis or	No	A full suite of geophysical and benthic surveys were completed across the wind farm sites and offshore cable corridors (excluding temporary works areas) at periods between September 2019 and August 2020 to support the baseline environment (**Section 6.4.2.1**) (see response to Project Definition comment). The

	results have been presented. There is a lack of suspended sediment concentration data. The only SSC figures quoted are 19 years old, apart from one SSC value recorded near Great Yarmouth in 2012. There is insufficient bathymetric and seismic survey data across the project area, in addition, there is a lack of mapping of seabed mobility, regional geology, Quaternary geology, sediment thickness, sediment transport pathways, coastal cells, regional sediment transport. There are no annual/biannual coastal frontage survey data. There are no scour pit model results. The nature of the sandbanks has not been characterised. DOW sediment plume dispersion model results are not presented, nether are the simulations - only qualitative assessments of this have been provided. Recommendations: Baseline characterisation needs to be fully established.		surveys undertaken are in line with that for previous offshore wind farm projects and enable appropriate baseline characterisation for EIA purposes. As noted above, an offshore temporary works area has been incorporated within the SEP and DEP offshore sites which does not include geophysical coverage. The Applicant has committed to post consent coverage of the additional areas potentially required for temporary works. See **ES Chapter 4 Project Description** (document reference 6.1.4) for further details. The justification for using a qualitative (conceptual) approach to the assessments is provided in **Section 6.6.3**. The wave regimes at SOW and DOW are considered suitable analogues for the likely wave

			regimes at SEP and DEP. However, more detail on the characterisation of the wave climate using SOW and DOW data is now provided in the baseline environment. The assessment of impacts on waves is based on numerical modelling (**ES Appendix 6.2 Wave Climate Assessment** (document reference 6.3.6.2)). The use of existing suspended sediment concentration data is proportionate to the potential effects on concentrations because most of the seabed is sand. In these environments, the potential for release of sediment into the water column as a plume is limited as the sediment is too coarse to be lifted off the bed. Also, ambient suspended sediment concentrations are unlikely to change over time and so the collection of new data would not add value and therefore use of old data is justified.

			Sea bed mobility, sediment transport pathways and regional sediment transport are covered in **Section 6.5.8**. Quaternary geology and sediment thickness are covered in **Section 6.5.2**. Regional geology outside the bounds of the project area is not relevant for EIA. Detailed information such as coastal cells and annual/biannual coastal frontage survey data are not included as the information would not be used in the assessment because the cable landfall will be HDD. Hence, there would be no changes to the frontage over and above the natural processes. There are no scour pit model results because scour resulting from the proposed development is not assessed. This is because scour protection will be used

			wherever scour will occur. The bathymetries of the sand banks have been described. Paragraphs have been added to the seabed sediment distribution sub-sections that relate to the DEP North array area and DEP South array area to characterise sediment type specific to the sand banks using the particle size analyses. More details on SOW and DOW export cable corridor dispersion and deposition modelling results are now provided in **Section 6.6.3.4.1**. All sections found in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).

Natural England	Comments: Additional data requirements include: · Wave climate data across a range of conditions across the project area. · Assessment of the 'wave shadow' (attenuation) effect of the array(s): existing and planned. · Bathymetric and geophysical data of the sandbanks is needed, in addition to an assessment of the effects (direct and indirect) due to the proposed development. · Cliff erosion data, beach profile data, coastal erosion assessment at, and adjacent to, landfall. · Sediment plume dispersion model results and simulations should be provided for different locations along the ECC (near the array(s), midway, and near landfall). These data should also include predictions of sediment deposition thickness. · Suspended sediment concentration data across the project area. · Sediment transport process study for cable crossings/protection. · Scour assessment, scour pit and wake modelling around wind turbine and OSP structures. · Thickness of sediment units across the project area (including consolidation and change over time). · Lithology across the project area (origin, composition). See Detailed Comments for further data requirements.	No	• Wave climate data – response same as for Data suitability and baseline characterisation above. • Assessment of the wave shadow effects is implicit in the assessment of changes to the wave regime (see **Section 6.6.5.2**). Assessment is not part of the baseline. • All the sand banks within the array areas and along the export cable corridor are mapped bathymetrically (see **Figures 6.1 to 6.4**). Changes to sand banks are now included in the assessment as a new Construction Impact 7 (see **Section 6.6.4.9**). • The presentation of cliff erosion and beach profile data, and a coastal erosion assessment at the landfall are not provided because the cable landfall will be HDD. Hence, there would be no changes to beach evolution

	Recommendations: See above.		and cliff erosion over and above the natural processes. • Justification for using previous SOW and DOW numerical modelling for suspended sediment concentration assessment is provided in **Section 6.6.3**. Bespoke sediment dispersion modelling for SEP and DEP was considered not to be required as satisfactory evidence for potential impacts was available from the SOW and DOW assessment results. Assessment is not part of the baseline. • Suspended sediment data – response same as for Data suitability and baseline characterisation. • Baseline sediment transport is presented in **Section 6.5.8**. A sediment transport process study for cable crossings/protection is not part of the baseline.

			• Scour assessment, scour pit and wake modelling – see response for Data suitability and baseline characterisation. Assessment is not part of the baseline. • The thickness of sediment units is covered in **Section 6.5.2.** Consolidation and change over time are not relevant for EIA. • Lithology of the geological units is covered in **Section 6.5.2.** All sections found in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).

Natural England	Comments: Chapter 8 presents a primarily qualitative approach to assessing the impacts of the proposed project scenario(s) on the receptors and pathways relevant to this chapter. This is not sufficient to provide a robust detailed baseline characterisation upon which the impact assessment can be based. Further information is also provided in the Detailed Comments. Recommendations: See above.	No	The Applicant request clarification on this point because it suggests that the assessment methodology is not sufficient to provide a robust baseline characterisation. Assessment does not dictate the baseline characterisation.
Natural England	Comments: The following pressures/impacts do not appear to have been considered in this chapter. These include: · Landfall - cliff stability/beach processes · Beach access Recommendations: The assessment should consider the potential effects of the landfall on cliff stability and beach processes. If beach access is required, then information should be provided on this.	No	Changes to the shoreline / landfall have been covered in **Section 6.6.5.6** (**ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)). The impact on cliff stability and beach processes were considered but not assessed because Horizontal Directional Drilling (HDD) will be used at the landfall. Hence, there would be no changes to cliff stability and beach processes over and above the natural evolution.

			Beach access does not form part of the Marine Geology, Oceanography and Physical Processes assessment.
Natural England	Summary of Main Concerns for Marine Geology Oceanography and Physical Processes Environmental Impact Assessment Subject: Cumulative Effect Assessment (CEA) Comments: The only cumulative impacts assessed are those between the project and Hornsea Project Three. The CEA concluded that in relation to marine geology, oceanography, and physical processes, no cumulative impacts were anticipated and were screened out of further assessment. The justification for this is not clear, neither is the methodology for the CEA.	No	Blythe Hub, Viking Link and AGG3 are now included in the list of projects/activities that could potentially have a cumulative impact with SEP and DEP (see **Section 6.7** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)). The potential for cumulative impacts has been assessed through the screening process along with Hornsea Project Three.

	Recommendations: The CEA methodology should be clarified, and the full range of other projects, plans and activities considered in the CEA, including the ongoing impacts due to the existing wind farm turbine structures and the possible cumulative effects of the Blythe Hub, Viking Interconnector, and Aggregate Resource Area (AGG3).		
Natural England	Comments: It is essential that the marine and coastal processes in the vicinity of the development are well understood. This is typically achieved through the analysis of new and existing field data along with existing studies and supporting numerical modelling. The data provided should be accompanied by sufficient metadata (descriptions of the data source, location, date, time, time-step, instruments used, etc). Data should also be of a sufficiently high accuracy. Given that the proposed development is located relatively close to the East Anglian coast, an eroding coastline, potentially sensitive sandbank receptors, and the Cromer Shoal Chalk Beds MCZ, the information provided in this chapter does not allow a full conceptual understanding of the physical environment baseline of the site and surrounding area, nor of the potential impacts of the proposed development. All sensitive receptors should be included in the study. Recommendations: Full baseline characterisation is needed.	No	The marine and coastal processes in the vicinity of the development are well understood because of project-specific, detailed and accurate bathymetric, geological and sea bed sediment data collection across the array sites and along the infield, interlink and export cable corridors, and use of existing wave and modelled tidal current data established through previous assessment of SOW and DOW. The geophysical data does have metadata, and this is presented in the chapter. More detail on the characterisation of the wave climate using SOW and DOW data is now provided in the baseline environment (**Section**

			6.5.5). The project-specific data that has been collected is comprehensive and provides a detailed conceptual understanding of the development site. This is presented in **Section 6.5** as the baseline environment. Detailed reports on the geology and transport processes in the MCZ are also provided as **ES Appendix 6.3 Sedimentary Processes in the CSCB MCZ** (document reference 6.3.6.3) **and ES Appendix 6.4 Sheringham Shoal Nearshore Cable Route - BGS Shallow Geological Assessment** (document reference 6.3.6.4). Hence, the baseline characterisation does allow a full conceptual understanding of the physical and sedimentary environments and is a sound basis for impact assessment.

			As noted above, an offshore temporary works area has been incorporated within the SEP and DEP offshore sites which does not include geophysical coverage. The Applicant has committed to post consent coverage of the additional areas potentially required for temporary works. See **ES Chapter 4 Project Description** (document reference 6.1.4) for further details. The sensitive receptors relevant to Marine Geology, Oceanography and Physical Processes are included in the assessment. Within the PEIR the Cromer Shoal Chalk Beds MCZ and the East Anglian coast were assessed however as a result of comments received from stakeholders on the PEIR, sand banks have now been added as a further sensitive receptor (see **Section 6.6.1**).

			All sections found within **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).
Natural England	Comment: Wavelength Recommendation: This definition is not restricted to bedforms, rather it should simply state that wavelength is the horizontal distance between two consecutive wave crests (or alternatively troughs).	No	This has been amended in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).

Natural England	Comment: Construction: Impact 7. Cable repair and reburial. Recommendation: The anchoring figures don't quite stack up. For example, for DEP in isolation, the footprint for 32 turbines + 1 OSP = 23,760m2, so 23760/33 (turbines + OSP) = 720, and 720/12 mooring lines = 60. The anchor footprint is quoted as up to 6m width. Therefore, should the anchor footprint be 60m? Please clarify this.	Yes	This has been amended. Also, since PEIR, note the maximum number of turbines for DEP has reduced from 32 to 30 and for SEP from 24 to 23.
Natural England	Comment: Operation: Impact 6: Morphological and sediment transport effects due to cable protection measures along the export cable protection measures along the export cable. Recommendation: In Chapter 8, Table 8.3, Impact 6, states that the "height of cable crossings would be 0.5m". However, it is presumed that this latter figure represents the height of the cable crossing only, it does not include the crossing height with cable protection. Section 5.4.7.7.2 in Chapter 5 Point 173, states that the "maximum width and length of cable protection for crossings is 21m and 100m, respectively. The maximum height of cable crossings will be 1.7m." This latter figure should be brought from Chapter 5, and incorporated into Chapter 8, and Table 8.3, to inform assessment of the potential effect of the cable crossing protection on	No	The maximum height of cable crossings has been changed to 1.7m.

	hydrodynamics, sediment transport processes, scour and seabed morphology.		
Natural England	Comment: Operation: Impact 7: Cable repair and reburial Recommendation: Where do the figures for cable repair and reburial for DEP in isolation, and SEP in isolation, come from? Also, how have the figures been calculated in the final column 'Notes and Rationale' for cable repair and cable reburial? Please clarify these issues and present calculations where relevant.	No	The figures for cable repair and reburial for SEP and DEP in isolation are based on the respective configurations and the types of cables needed if they are installed on their own (without the other present). These worst cases have been updated according to the latest Project Description. Impact 7 in **Table 6-2** of **ES Chapter 6 Marine Geology, Oceanography and Physical**

			Processes (document reference 6.1.6) has been updated to present the worst case scenario for cable repair, replacement and reburial more clearly. These calculations are all presented in **Table 4-31** of **ES Chapter 4 Project Description** (document reference 6.1.4).
Natural England	Comment: The three construction scenarios' Recommendation: Technically, there are four construction scenarios: DEP in isolation, SEP in isolation, SEP and DEP concurrently, and SEP and DEP sequentially.	Yes	The description of the project development scenarios has been amended in **Section 6.3.2** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6) as has the presentation of the worst case scenario table (**Table 6-2**). Further detail on project development scenarios is provided in **ES Chapter 4 Project Description** (document reference 6.1.4).

Natural England	Comment: No suspended sediment concentration data were collected for this application. Coastal estimates from the southern North Sea Sediment Transport Study (HR Wallingford, 2002) were extrapolated from locations further offshore, which were the points closest to the export cable corridor (nearshore section) and landfall. 'Hence, there is uncertainty as to the validity of this extrapolation inshore'. Recommendation: NPS EN-3 states that assessment of the effects on the subtidal environment should include: 'increased suspended sediment loads during construction', and 'increased suspended sediment loads in the intertidal zone during installation'. Therefore, to minimise the uncertainty regarding SSCs in the nearshore zone, modelling of discharged dredge or trench material should have been carried out for the proposed development. This is important in terms of understanding the potential impact of SSCs on sensitive receptors such as the CSCB MCZ, EA coast, and the sandbanks. Changes in SSC during installation may also require assessment and monitoring during cable installation within, and near, the MCZ.	No	Additional and more up-to-date baseline data on suspended sediments has been added from the Cefas (2016) report - Suspended Sediment Climatologies around the UK. Hence, the uncertainty regarding suspended sediment concentrations at the coast is removed. The Applicant has conceptually assessed increased suspended sediment due to cable installation. This was supported by the sediment dispersion modelling undertaken along the export cable route for DOW. Bespoke sediment dispersion modelling for SEP and DEP was considered unnecessary given the high level of confidence in the DOW results to provide an analogy alongside the supporting evidence base from other offshore wind farms and the aggregate industry. Justification for using the DOW results is presented in **Section 6.6.3** (**ES**

			Chapter 6 Marine Geology, Oceanography and Physical Processes (document reference 6.1.6)). Monitoring of suspended sediment concentrations during cable installation would serve no purpose as the impacts of any release into the water column would only manifest at the sea bed and not in the water column i.e. there would be no dredging during cable installation (other than for sand wave levelling purposes which is assessed separately).

Natural England	Comment: Bathymetry and bedforms. Recommendation: A figure illustrating bathymetric data across the whole project area should be included as this would provide the wider regional physical context for the current assessment. Either a MBES/SBES covering the full extent of the development area, as well as the associated zone of direct impact, should be included. In addition, high resolution swath bathymetry data of the proposed extension areas, interlink cable & export cable corridors and vicinity would provide greater detail of the seabed features and a better understanding of the seabed morphology. For any areas where the bed is known to be mobile, new project-specific survey information is needed – this would also help refine the areas where sand wave or bedform levelling is deemed necessary.	No	Project-specific multibeam bathymetry has been collected for the wind farm sites, and along the interlink and the export cable corridors (excluding temporary works area). These data cover the whole project/development area, providing the baseline understanding of sea bed features and mobile bedforms. These are discussed in **Section 6.5** - baseline environment and illustrated in **Figures 6.1** to **6.4**. Sections and figures found in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).

Natural England	Comment: Offshore geology Recommendation: Regional geology maps should be included here, including a regional Quaternary geology map for the project and wider areas. We advise these should be included in the ES.	No	Regional geology outside the bounds of the project area is not relevant for EIA. Descriptions of the geology for the array sites, and along the interlink and export cable corridors are provided in **Section 6.5.2** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).
Natural England	Comment: Geological formations present at SEP and DEP, interlink cable corridor and export cable corridor. Recommendation: Seismic survey data would enable evaluation of the characteristics and thicknesses of the sub-surface geology, including any palaeochannels that run across the project area, and the presence of the bedrock (i.e. Cretaceous Chalk). We advise this be included in the ES.	No	Seismic (sub-bottom profiler) data has been captured for the array sites and export cable corridor, and is presented in **Section 6.5.2**. The stratigraphy and thicknesses of geological units have also been presented. Two new plates (**Plate 6.1** and **Plate 6.4**) have been added to show the depths to the base of the two uppermost units across the project area (Botney Cut and Bolders Bank Formations) and the position of the Weybourne Channel Deposits along the export cable corridor. **ES Appendix 6.3 Sedimentary Processes in the CSCB MCZ**

			(document reference 6.3.6.3) and BGS study (**ES Appendix 6.4 Sheringham Shoal Nearshore Cable Route - BGS Shallow Geological Assessment** (document reference 6.3.6.4)) provide more detail of the geology across the MCZ. Section and Plates found in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).
Natural England	Comment: Wave climate studies for this assessment were based on the Sheringham Shoal Offshore Wind Farm in 2006 and studies undertaken for Dudgeon Offshore Wind Farm between 1988 and 2004. Recommendation: PINS commented in 2019 that the use of existing data provides a useful baseline, but their limitations in terms of age and spatial coverage should be acknowledged. These are dated and pre-construction wave studies. Therefore, more recent data or evidence should be provided to assess any changes to the hydrodynamic regime, not only due to the construction of the existing DOWF and SOWF, but also	No	The pre-construction baseline wave data from SOW and DOW alongside other more recent wave buoy data has been used to support the SEP and DEP assessment. Bespoke wave data has not been collected as part of the assessment, and so the request to provide wave roses at different locations across the development cannot be fulfilled. The assessment of effects on waves is completed using numerical modelling calibrated

	the proposed extension turbines and their foundations. It is also important to understand the baseline wave climate over a broad range of conditions including calm, intermediate and annually significant storm events which are seasonal. The wave climate study should consider a range of wave data locations to describe the broad characteristics of the wider area, including the nearshore. It is possible that the extension project structures could reduce the height and affect the period of waves passing around them, in turn this could affect the patterns and rates of sediment transport in intermediate and shallow water depths (typically <10 to 15m but potentially deeper during large storms) such as the northwest area of DEP (N) near the top of the SEP-DEP (N) interlink cable, the furthest north part of DEP (S) next to DOWF, and the most westerly part of SEP. It would be useful to present wave data for different areas of the proposed development as wave roses and figures of significant wave height variation across the study area for different percentiles of exceedance. In other words, new wave data may not be required for the new extension projects specifically, if historical records are available from other suitably located wave buoys, especially when used in conjunction with an adequately calibrated and validated hindcast dataset. Therefore, the wave data referred to in Section 8.5.5.1, which was informed through the SOWF desk study and pre-construction studies for DOWF, should be presented in the PEIR, along with the details of the parameters, methods, and their suitability/limitations. Lastly,		using the measured waves (**ES Appendix 6.2 Wave Climate Assessment** (document reference 6.3.6.2)).

	there is no description of wave-driven currents, which should be rectified.		
Natural England	Comment: Export Cable Corridor (ECC). “Nearshore wave conditions along the ECC are less severe than the SEP and DEP sites due to the protection afforded by sandbanks such as Sheringham Shoal and Pollard Bank.” The other sand banks and the generally shallower water west from the SEP site also influence wave directions closer to the coast due to refraction. Recommendation: More detailed bathymetric/ geophysical data are needed for the sandbank areas across this proposed development. This data would help provide a better understanding of the sandbank morphology, stability, and their possible alteration due to the proposed development.	No	The sea bed to the west of SEP does not contain sand banks. The sea bed is likely to be a thin Holocene unit with limited mobility which would not be impacted by the wind farm. Provision of more detailed bathymetric / geophysical data for this area (which is outside the DCO boundary) is not considered necessary and would be disproportionate. As noted above, an offshore temporary works area has been

			incorporated within the SEP and DEP offshore sites which does not include geophysical coverage. The Applicant has committed to post consent coverage of the additional areas potentially required for temporary works. See **ES Chapter 4 Project Description** (document reference 6.1.4) for further details.
Natural England	Comment: States that 'Predicting coastal erosion rates is critical to forecasting future problem areas…' Recommendation: Yet, this qualitative statement is not backed up by any quantitative evidence or data. This should be provided to inform the impact assessment.	No	The statement relates to the impact on coastal erosion of climate change only within the context of the baseline. This statement is not related to impacts due to SEP and DEP. Given the landfall will be HDD, there would be no changes to cliff erosion over and above the natural rates of erosion, so presentation of detailed cliff erosion rate data is not warranted.

Natural England	Volume 1 Chapter 8 Marine Geology, Oceanography and Physical Processes Section: 8.5.7 Comment: Sea Bed Sediment Distribution Recommendation: Data should also be presented to show the thickness of the different Quaternary sediments across the project area. This would also show where the thickness of Quaternary sediments is zero or negligible and thus indicate any areas of exposed bedrock. In turn, these could be correlated with any sidescan sonar or similar data. These should be provided in the ES.	No	Sub-bottom profiler data and multibeam/side-scan interpretation have been used to describe Quaternary unit thickness and locations where bedrock may be at or close to the sea bed across the project area. This information is presented in the chapter. Two new figures (**Plates 6-2** – **6-5** in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)) have been added to show the depths to the base of the two uppermost units across the proposed development (Botney Cut and Bolders Bank Formations) and the position of the Weybourne Channel Deposits along the export cable corridor. The MCZ study (**ES Appendix 6.3 Sedimentary Processes in the CSCB MCZ** (document reference 6.3.6.3)) and BGS study (**ES Appendix 6.4 Sheringham Shoal Nearshore Cable Route - BGS Shallow Geological**

			Assessment (document reference 6.3.7.3)) provide more detail of the Quaternary geology across the MCZ.
Natural England	Comment: Sample numbers do not tally with those in Figure 8.6. Point 109 states that 16 samples were recovered in DEP North and 11 samples in DEP South), but Figure 8.6 shows only 13 samples in DEP North and 8 samples in DEP South. Similarly, the number of samples quoted for the interlink cable corridors and export cable corridor do not appear to correspond with those in Figure 8.6 Recommendation: The sample numbers in Point 109 and Figure 8.6 should be the same or an explanation for the discrepancy provided.	No	The description of the number of samples in **Section 6.5.7.1** in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6) has been updated and an explanation has been provided to explain the apparent discrepancy.

Natural England	Comment: Sediment sample analysis Recommendation: Please provide a description of sediment grain properties (e.g. grain size, shape, density, distribution and settling velocity).	No	Particle (grain) size is presented as five cumulative particle size distribution curves which are described in the chapter and illustrated as **Plate 6.14** to **Plate 6.19** in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6). Shape and density are irrelevant for the purposes of EIA, and settling velocity is a parameter that is only relevant to suspended sediments.
Natural England	Comment: No sea bed sediment samples were collected in the DEP N to DEP S interlink cable corridor. Recommendation: The geophysical survey for DOW (2009) is referred to, but the sediment sample analysis relevant to this interlink cable is not included here. A map showing where the DOW (2009) samples were obtained should be included also. Furthermore, these data are now old (12 years) and from pre-construction surveys. It is therefore advisable to include more recent data.	No	The sediment sampling campaign undertaken by MMT in August 2018 (MMT, 2018a) has been used to characterise sediment within the DEP North array area to DEP South array area interlink cable corridor. There were six relevant samples (DOW24, DOW25, DOW26, DOW32, DOW45 and DOW54) (now presented in **Figure 8.2** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).

Natural England	Comment: “Between these opposing directions of transport is a bedload transport parting.” Recommendation: Please could a schematic be provided showing coastal sediment transport pathways including sediment cells, net drift directions, sediment sinks, parting zones etc? Points 123 & 124 are largely based on the Norfolk Boreas Environmental Statement Chapter 8, Page 42.	No	**Section 6.5.10** describes sediment transport at the coast/landfall whereas **Section 6.5.8** covers bedload transport in the marine environment. The title of this section has been changed to 'Offshore Bedload Sediment Transport' and a new plate added from Kenyon and Cooper (2005) to illustrate. Both sections found in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).
Natural England	Comment: “Regional sediment transport pathways in the southern North Sea…” Recommendation: A regional sediment transport map should be provided.	No	A new plate from Kenyon and Cooper (2005) has been added as illustration in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).
Natural England	Comment: “Tidal currents are the main driving force of sediment transport…” Recommendation: This is not true for all areas of the proposed development	No	The Applicant agrees that wave transport at the coast is driven by waves and this is covered in **Section 6.5.10**. **Section 6.5.8** is about bedload sediment transport in the offshore. The title

	and should be clarified. Near-bed tidal currents may dominate bedload transport offshore, in the deeper water sites, but within the nearshore and at the coastline, bedload transport is primarily wave-driven. It would be useful to include a sediment mobility study/map that compares bathymetric surveys to determine historic migration rates and the directions of the sandwaves within the SEP & DEP site. This would help inform sandwave levelling requirements and recoverability of the bedforms.		of this section has been changed to 'Offshore Bedload Sediment Transport'. The Applicant does not have and is not aware of any historic bathymetry data within the SEP and DEP site with which to compare the recent project-specific data, and so this analysis cannot be undertaken. A new Construction Impact 7 (new **Section 6.6.4.9**) has been added to the chapter, which assesses the potential interruptions to bedload sediment transport due to sand wave levelling for offshore cable installation (infield and interlink cables). All sections found in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).

Natural England	Comment: Seabed mobility across the ECC in the CSCB MCZ Recommendation: Seabed mobility should also be shown on a map across this area, as well as described qualitatively in the text.	No	Maps of sea bed sediment distribution across the MCZ in the ECC are presented in **ES Appendix 6.3 Sedimentary Processes in the CSCB MCZ** (document reference 6.3.6.3). More details on sediment transport in the MCZ is presented there. The chapter itself provides a summary of that data.
Natural England	Comment: Comparison of SOW ECC geophysical pre- and post-construction surveys are described in the text. No figures have been provided. Recommendation: A figure should be provided to show the differences in seabed elevation between pre- and post-construction, to back up the qualitative description in the text.	No	All the data is in **ES Appendix 6.3 Sedimentary Processes in the CSCB MCZ** (document reference 6.3.7.2) including figures comparing different aged bathymetries which **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6) provides a summary of.

Natural England	Comment: Discussion of the range of sediment transport potentials across the stratigraphic units mapped along the SEP and DEP cable corridor (Royal HaskoningDHV, 2020). Recommendation: If these have been mapped, please could the map be provided?	No	See **ES Appendix 6.3 Sedimentary Processes in the CSCB MCZ** (document reference 6.3.6.3).
Natural England	Comment: “However, no significant difference was found in sediment composition between the trenches and the control areas adjacent to the trenches.” Recommendation: The 2020 survey involved random stills, photographic stills, and video. As discussed in our formal response (29 March 2021), photographic stills cannot provide a measure of the sediment thickness and should have been compared with accompanying geophysical/bathymetric survey data. The type of surficial sediments may be apparent in the photographic stills, and the trenches may not be apparent in the photographs, but the depth of infilling within the trenches cannot be gauged from the photographic stills. Therefore, there may still be a depression present which cannot be observed by photographic evidence alone.	No	There was no geophysical data collected in 2020 with which to support this type of analysis. Only benthic surveys were undertaken at this time as part of the post-construction monitoring for the SOW export cable. This is the interpretation based on the data that was available, and was purely a comparison of sea bed sediment types, not bathymetry.

Natural England	Comment: Suspended sediment transport. “Typical mean summer suspended sediment concentrations across SEP and DEP are less than 10mg/l whereas mean winter concentrations are 30mg/l…” Recommendation: The summer and winter SSC figures quoted are attributed to the HR Wallingford et al (2002) study. These figures are 19 years old. Moreover, Carroll et al (2010) refer to the same HR Wallingford report and quote SSC of 8 to 128mg/l during summer months, and 16 to 128mg/l during winter months for the Lynn and Inner Dowsing area. Carroll et al also quote EA data for Lynn and Inner Dowsing coastal water monitoring data that indicate a SSC range of 5 to 525mg/l, with an average of 129mg/l. More recently, Norfolk Vanguard East SSC measurements recorded values of 0.3 to 108mg/l over a period of a year. Baseline SSCs across Norfolk Boreas were estimated to vary between 0 to 100mg/l. The values quoted for SEP and DEP would appear low in comparison to Boreas, Vanguard and Lynn and Inner Dowsing. Whilst Boreas and Vanguard are further offshore, and Lynn and Inner Dowsing is closer inshore, their relative SSC values could be used to adjust those quoted for SEP and DEP. This is important as the SSC figures used by SEP and DEP will provide an indication of background SSCs across the project area.	No	The suspended sediment climatologies calculated by Cefas (2016) have been added to the baseline to update those of HR Wallingford et al (2002) (**Section 6.5.9** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)). This provides a more recent and longer time-series of data and is a robust estimate of the baseline suspended sediment concentration environment at SEP and DEP.

Natural England	Comment: Coastal Processes at the Weybourne (Muckleburgh Estate) Landfall Recommendation: This section should consider regional coastal characterisation, such as coastal cells.	No	Detailed information on regional coastal cells is not included as the information would not be used in the assessment. However, a reference to the sub-cell in which the landfall sits has been added.
Natural England	Comment: “The coast to the east of the landfall is exposed to waves and cliff erosion is occurring in places.” The predicted net sediment transport rates in the region quoted are from the HR Wallingford 2002 study. Recommendation: This statement is vague. Please provide information where cliff erosion is occurring and consider any coastal defences along this stretch of coast. Photographs of the frontage would help provide context. It might be worth looking for more recent and more specific estimates of sediment transport rates.	No	More specific information has been added. A photograph of the cliffs has been added as a plate (**Plate 6.21** in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)). The numbers for transport quoted in the HR Wallingford (2002) work are reproduced in the Shoreline Management Plan (SMP) 2 for this coast and so are considered ‘the most recent’. Indeed, a search found no other estimates.

Natural England	Comment: “The principal receptors with respect to marine geology, oceanography and physical processes are those features with an inherent geological or geomorphological value or function which may potentially be affected by SEP and DEP.” Recommendation: The sandbanks across the DEP&SEP project area are themselves receptors and as such, should be included in the list of impact receptors. Potential impacts on these receptors due to the proposed development should therefore be assessed. Changes to the sandbanks may come about directly through installation of project infrastructure, or indirectly through changes to a pathway. The stability of the sandbanks should be assessed as part of the impact assessment, through examination of historic charts. Impacts may also be exacerbated by projects acting cumulatively or in-combination.	No	The sand banks in DEP North and DEP South array areas are now included as receptors and potential impacts on them have been assessed. An assessment of landscape scale stability of the sand banks would be disproportionate to the potential impacts and would not aid the assessment of potential changes due to the wind farm. It would provide information on broad-scale historical evolution but would not be used in the assessment of future change to the system, which is based on changes to driving processes not long-term form.

Natural England	Comment: East Anglian Coast – shoreline retreat rates Recommendation: Natural England queries the source of the figures. Is the reference AECOM (2013)? Also, we note that no beach profiles have been included. Consideration should be given to the potential long-term effects of the project on shoreline erosion and beach lowering, and vice versa (implications for project infrastructure, cable burial etc). Therefore, a study of historic and more recent trends in morphological change at the coast should be carried out.	No	Yes – the reference is AECOM 2013. Beach profile data at the landfall are not presented because the cable landfall will be HDD. Hence, there would be no changes to beach evolution over and above the natural processes. Natural processes will continue unabated during both construction and operation of the landfall. The Applicant has made statements about potential future erosion and roll-back based on AECOM 2013, but a bespoke detailed analysis of historic beach profile data is not considered to be warranted here. It would not provide any further evidence to support the assessment over and above the published existing work. In addition, **ES Appendix 3.2 Cable Landfall Concept Study** (document reference 6.3.3.2) of **ES Chapter 3 Site Selection and Assessment of**

			Alternatives (document reference 6.1.3) provides further information on erosion rates and how these would factor into the final HDD design.
Natural England	Comment: Justification for use of a conceptual approach for the project. "Previous numerical modelling and theoretical work has been undertaken specifically for the SOW and DOW located in close proximity to SEP and DEP to assess the potential effects of the extensions on the marine geology, oceanography and physical processes". "Justification for using the modelling results from SOW and DOW as the principal evidence of potential effects or impacts at SEP and DEP…" Recommendation: PINS (2019) commented that the 'ES [PEIR] should provide details of all methods used along with any assumptions and limitations and an explanation of how these have been factored into the assessment'. Without the details of the	No	Further details on the methods and results of the modelling and theoretical work at SOW and DOW have been added to **Section 6.6.3** in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6). The new information has essentially been taken from the tidal currents and waves impact assessment sections for operation and the suspended sediment concentration impact assessment section for construction of the export cable.

	modelling theoretical work undertaken for the SOW and DOW projects, it is not possible to agree with the justification to use them. Therefore, these details should be provided in, or as an appendix to, the ES.		Numerical modelling of waves has now been completed for potential operational impacts due to the presence of the foundation structures (**ES Appendix 6.2 Wave Climate Assessment** (document reference 6.3.6.2)).
Natural England	Comment: Sea bed sediments at all sites are similar. Recommendation: Similar in places, but not the same. As discussed previously, a sediment distribution map across the study area would back this up.	No	A map showing SOW, DOW, SEP and DEP sediment distribution and types is now included as **Figure 8.2** in **ES Chapter 8 Benthic and Intertidal Ecology** (document reference 6.2.8).
Natural England	Comment: 'post-construction geophysical and environmental survey data for SOW and DOW has been used to retrospectively 'ground-truth' the pre-construction numerical modelling and theoretical results for the existing wind farms to provide confidence in their use…' Recommendation: Where and how has this 'ground-truthing' been carried out?	No	It was carried out as part of the EIA process and details are included in the relevant impact assessment. (**Sections 6.6.4.9, 6.6.5.1, 6.6.5.2** and particularly **6.6.5.3** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)).

	This needs to be provided in the coastal process chapter of the ES.		
Natural England	Comment: “It is estimated that the maximum number of foundations that would require drilling would be 5%...” Recommendation: Please provide evidence that 5% is a realistic worst-case scenario for the number of foundations which would require drilling.	No	This is the maximum percentage determined through examination of the available ground condition information. This is the worst-case scenario assessed – i.e. it is the Rochdale Envelope for drilled foundations.
Natural England	Comment: Impact 2a. Changes in sea bed level due to sea bed preparation for foundation installation Recommendation: This section does not state what the seabed preparation would entail, however, based in the details in Section 8.6.4.1 and Table 8.3, it is assumed that this would involve dredging (using a trailer suction hopper dredger and installation of a bedding and levelling layer) up to a sediment depth of 5m. These details should be provided alongside the impact assessment.	No	As stated in the Natural England response, they are provided in **Section 6.6.4.1** and both in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6). It is considered that it would be duplication and unnecessary to include again here.

Natural England	Comment: “The resulting mound would be a measurable protrusion above the existing sea bed (likely to be tens of centimetres to a few metres high)” and “the overall change in elevation of the seabed is small compared to the absolute depth of water…” Recommendation: In the deeper water locations, the overall change in elevation of the seabed would be small compared to the absolute depth of water. However, in shallow water depth areas, for example, 11m in SEP and 14m in DEP with disposal mounds ‘a few metres high’ this could potentially give rise to secondary effects depending on the persistence of the mounds. Therefore, the reduced water depth could be as much as 30% or more. This would not be within the natural change to the bed caused by sand waves and hence the blockage effect on physical processes would not be negligible. Whilst, it is likely, that the disposal mounds (unless comprised of clay or chalk aggregates) will be redistributed by waves and tidal currents, it would seem sensible to confirm this through monitoring, particularly for those mounds in shallower depths.	No	The **Offshore IPMP** (document reference 9.5) includes proposals for monitoring of any mounds of sediment created during sea bed preparation for GBS foundations in water less than 15m deep, if required.

Natural England	Comment: Impact 3: Change in suspended sediment concentrations due to ECC installation “No sandwave levelling is expected in a SEP in isolation scenario.” Recommendation: Please could this be expanded upon with justification.	No	The statement reflects the fact that there are no sand waves along the export cable corridor for SEP in isolation. Text has been added to clarify.
Natural England	Comment: SEP or DEP in isolation - sandwave levelling. “Sandwave levelling may be required at the northern end of the export cable corridor DEP North…” Recommendation: No details have been provided in Chapter 8 for the estimated area of seabed disturbed by sandwave levelling in terms of depth or width. However, Chapter 5 (Section 5.4.7.1) discusses pre-sweeping requirements for cable installation which is based on analysis of the 2020 geophysical survey. This identified four areas requiring pre-sweeping: two at DEP (N), one south of DOW, and one within DEP (S). How does the value for the cable route pre-sweeping footprint in Table 5-4 (Chapter 5) relate to the volumes of sediment disturbed provided in Table 8.3 (Chapter 8)? If detailed geophysical surveys are carried out	No	Estimates of the volumes and areas of sediment that would be dredged by sand wave levelling for cable installation are provided in **Table 6-2** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6). Detailed geophysical surveys have been undertaken which has informed the worst case scenario estimates for sand wave levelling. Gardline (2020a), Gardline (2020b) and the Benthic

	across the whole project area, then this would identify the areas of large-scale bedforms and thus inform a more precise understanding of the requirement for seabed levelling. A map detailing seabed sediment and sandwaves (and other large-scale bedforms) across the project areas should be provided. Asymmetry of sandwaves should be identified. The likely dredger capacity should also be estimated and considered. All possible efforts should be made to avoid areas of sandwaves where possible or minimise the need for clearance by applying micrositing the cable. If sandwaves need to be crossed, then this should be carried out at a high crossing angle to minimise dredge volumes. An estimation of the proposed timescales of post-levelling bedform recovery should also be provided.		Characterisation Reports (**ES Appendices 8.1 and 8.2** of **Chapter 8 Benthic Ecology** (Document references 6.3.8.1 and 6.3.8.2)) provide detailed information on seabed sediment and sand waves throughout SEP and DEP. Heights and orientations of sand waves are described in **Section 6.5.1**. The dredger capacity would not be known until post consent and would not feed into the assessment of potential impact. As described in **Table 6-3**, micro-siting of sand waves and mega ripples as far as possible would be undertaken and would be considered during detailed design and on which the relevant SNCBs would be consulted. Additionally, the **Offshore IPMP** (document reference 9.5) includes provision for the monitoring of any levelled sand waves.

			Unattributed tables and sections found in **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)
Natural England	Comment: i. Reference is made to the results from DOW ECC modelling and 'conceptual evidence-based assessment' ii. It is 'anticipated' that changes in SSC due to EC installation would be less than those that have been assessed in relation to the disturbance of near-surface sediments during foundation installation activities. Recommendation: (i) The results from the modelling at the DOW ECC are referred to, but not presented. The model results should be included in the ES if they are being used as supporting evidence. (ii) The relative magnitudes of GBS foundation installation and ECC installation sediment disturbance volumes are not comparable. Worst case volume of sediment that would be disturbed for 102km of EC installation is 195,900m3. Whereas, the total worst-case seabed preparation volume for 56 conical GBS foundations for 14MW turbines is 929,126m3. This is not a useful statement and should be amended.	Yes	(i) More details on SOW export cable corridor dispersion modelling results are now provided in **Section 6.6.3** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6). (ii) This statement is considered to provide a useful comparison of the relative magnitudes of volumetric disturbance for both activities and provides an indication that foundation disturbance is much larger than cable disturbance and hence a better metric for the worst case scenario. It should also be noted that the 14MW turbine is no longer within the design envelope. The lowest

			capacity turbine being considered is 15MW.
Natural England	Comment: “although suspended sediment concentrations will be elevated, they are likely to be lower than concentrations that would develop in the water column during storm conditions including the December 2013 storm surge” Recommendation: What are these SSC values? These values need to be provided to allow a valid comparison to be made, and the relative change in SSC due to EC installation assessed.	No	These values are not known as no bespoke measurements were made at the time of the storm surge. A reasoned argument regarding relative contribution to the suspended sediment load from a storm and jetting is already included in **Section 6.6.4.5.1** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).

Natural England	Volume 1 Chapter 8 Marine Geology, Oceanography and Physical Processes Section: 8.6.4.5.1 Point 216 Comment: “It is likely that the increase in concentrations would be greatest in the shallowest sections of the offshore cable corridor…”, “with values up to 170mg/l recorded in the vicinity of the coast at Great Yarmouth (ABPmer, 2012). Recommendation: We assume this point is referring to SSCs. Also, it is presumed that this coastal SSC value provides a background level of SSC against which elevated SSC due to cable installation in the nearshore could be compared. However, there are no comparative values presented for the SEP and DEP ECC in the nearshore. Further evidence is needed to support this conclusion.	No	It is referring to background SSCs. The predicted concentrations in the plume from export cable installation (up to 20mg/l) modelled for SOW apply universally along the cable including the nearshore. These values are low compared to the ambient nearshore concentrations.
Natural England	Comment: “It should be noted that the modelled results are only applicable to the nearshore area where chalk or other competent beds are exposed or have only a thin layer of mobile sediment.” Recommendation: This would suggest that the DOW (2009) suspended sediment plume dispersion modelling results are not valid	No	The results are applicable to all areas of the MCZ where there is mobile sediment that can be transported in the water column. Mobile sand would move as bedload which is a different process to movement in the water. Bedload is not covered in

	for the mobile sand regions of the CSCB MCZ, but would be applicable to the coarse lag and exposed chalk bed regions (depending on suitability of the DOW model results generally to the proposed development options – see Point 2.41 below).		this impact – it is restricted to suspended sediment.
Natural England	Comment: Impact 4: Changes in seabed elevation due to deposition from the suspended sediment plume during EC installation within the offshore cable corridor. Plume modelling simulations for DOW. Recommendation: The DOW plume modelling simulations should be provided in the ES, along with details of the different scenarios modelled to demonstrate the suitability of these data for the DEP in isolation, SEP in isolation, SEP & DEP integrated options. Furthermore, it needs to be shown that the DOW simulations are representative of sediment plumes that would arise due to EC installation at different locations along the ECC i.e. near the arrays, midway along the ECC, and near landfall. Limitations of using the DOW (2009) sediment plume dispersion modelling results also need to be discussed, and an analysis of how the DOW (2009) pre-construction model parameters relate to those for the proposed project options provided.	No	More details on the SOW export cable corridor dispersion and deposition modelling results are provided in **Section 6.6.3** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).

Natural England	Comment: Plume modelling simulations for DOW show that sand-sized material would settle out of suspension within less than 20m from the point of installation. Recommendation: This statement raises several questions that it would be useful to clarify. What depth was the discharge of dredged or trenched material within the water column, i.e. close to the sea surface, or close to the sea bed? What were the quantities of disturbed seabed sediment used in the DOW model simulations? How do these quantities compare with those for DEPN/DEPS/SEP/DEP&SEP? Point 231 describes the settling out of sand-sized material within less than 20m from the point of EC installation, however, it does not give an indication of the thickness of the deposit – this needs to be included and an assessment of how this would impact on the interest features of CSCB MCZ.	No	The plume was generated from the sea bed as the trench was excavated. More details on the SOW export cable corridor dispersion and deposition modelling results are provided in **Section 6.6.3** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6). The deposit of sand would be similar in composition to the existing adjacent sea bed given that only a small proportion of the fines will be lost into suspension. The width of this deposit along the line of the cable is likely to be less than 20m and so the area would be extremely small compared to the area of the entire MCZ. There would be negligible impact on the interest features from both habitat and footprint perspectives.

Natural England	Comment: Impact 6: Change in seabed level due to offshore cable installation (infield and interlink cables) Recommendation: There does not appear to be a similar section for changes in seabed level due to offshore cable installation for the export cables. Where cable routes cross sandbanks, the impact on the sandbanks in terms of hiatus or disruption to sediment transport processes will need to be considered for infield, interlink and export cables.	No	**Section 6.6.4.6** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6) provides an assessment of change in sea bed level due to deposition from the suspended sediment plume during export cable installation within the offshore cable corridor (Impact 4). The lengths of cable that cross sand banks is limited. Where they do, they will be buried and there will be a rapid infilling of the trench and return to natural sediment transport processes.

Natural England	Comment: Impact 7: Indentations on the seabed due to installation vessels – HDD exit point within Cromer MCZ Recommendation: Any cable installation activities within the MCZ have the potential to (temporarily or permanently) damage or change the nature of the seabed within the MCZ. In turn, this may hinder the conservation objectives of the MCZ and put pressure on the designated features (e.g. increased suspended sediments, deposition, temporary and/or permanent habitat loss).	No	Noted. Potential impacts on the MCZ during cable installation are assessed for the relevant impacts in **Section 6.6** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).
Natural England	Comment: Impact 4: Loss of seabed area due to the footprint of wind turbines and OSP foundation structures Recommendation: No scour assessment has been carried out. Predictions of the size and shape of scour pits and wakes should be provided for the wind turbine and OSP foundation structures, as this would inform the need for scour protection and the appropriate type of scour protection. Scour assessments are particularly important to those foundation structures in relatively shallow water where scour volumes are likely to be greatest. Secondary scour effects of scour protection need to be considered.	No	No scour assessment has been carried out. An assumption has been made for the worst-case scenario that scour protection will be used wherever scour will occur, reducing sediment release to negligible quantities. A conservative worst-case scenario of all foundations having scour protection is considered for footprint loss. Secondary scour effects associated with scour protection would be confined to within a few meters of the direct footprint of

			that scour protection material, and so the potential impact would be minimal. The loss of habitat due to the direct footprint of the scour protection is considered to be worse than the effects of scour without scour protection (or secondary scour). The **Offshore IPMP** (document reference 9.5) includes provision for monitoring of secondary scour around scour protection.
Natural England	Comment: Impact 2: Changes to the wave regime due to the presence of structures on the seabed (wind turbine and OSP foundations). Wave sheltering effects due to presence of foundation structures could create a wave shadow zone typically up to several tens of kilometres from the site along the axis of wave approach. Recommendation: What is the WCS for a wave shadow zone extending several kilometres from the site along the axis of wave approach? Given that the closest point from SEP OWF to the coast is 13.6km, this could impinge on the coastal hinterland to SEP & SOW (which would have a combined wave sheltering effect). The closest point from the DEP OWF site to the coast would be 24.8km which is still within 'several tens of	No	The numerical modelling and theoretical work for the adjacent SOW and DOW sites indicate that wave effects are local to each foundation and do not interact with adjacent foundations as they are too far apart and there is no combined effect. This is supported by a strong evidence base from other offshore wind farms. The evidence base also suggests that even with a wave shadow zone that may extend several 10s of kms the change in wave heights is only a few percent.

	kilometres' of each other. This needs to be quantified. The spatial extent of projected changes to the wave regime downwind of the array(s) need to be understood, and the potential reductions in significant wave height at the adjacent coastline and the impacts on morphological processes be assessed. Furthermore, what is the potential WCS impact of this 'wave shadow' effect and reduced tidal flow speed (Section 8.6.5.1) on the sandbanks close to the array(s) (e.g. Sheringham Shoal, Pollard Bank, Cromer Knoll)? For example, how would a 1-2% reduction in average tidal flow speed and 'typically less than 10% of baseline wave heights near each wind turbine', translate as a percentage change in nearshore sediment transport, accretion or erosion, or coastal erosion?		These wider effects will be within the range of natural variability. Hence, there is confidence that there will be negligible impact on the coast of East Anglia or nearshore areas. The main driver of sand bank morphology is tidal currents with secondary influence of waves where the crest is shallow or during storm conditions. A 10% change in wave height is local to each turbine with only few percent change further afield where these sand banks are located. These very small magnitudes of change in wave height will have little impact on sand bank morphology.
Natural England	Comment: Impact 6: Morphological and sediment transport effects due to cable protection measures within the offshore cable corridor (export cables) Recommendation: There are no specifications for potential cable crossings with the DEP/SEP or DEP&SEP projects within Chapter 8, apart from an overall lifetime footprint. Neither is there an	No	A description of the cable crossings along the export cable which is considered to be sufficient for the purposes of the impact assessment is provided in **Table 6-2** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference

	evaluation of the potential impacts of the different cable crossings on morphological and sediment transport processes. A list of potential cable crossings has been provided in Chapter 5 (Section 5.4.7.7.4). Chapter 18 (Section 18.6.1.3), assesses the potential impacts of the SEP & DEP project(s) on subsea cables and pipelines are considered. However, to assess the potential impacts of cable protection within the ECC on marine and coastal receptors and pathways, specific details should be provided in Chapter 8. For example, a map showing the location of all potential cable crossings across the project area, anticipated cable crossing protection parameters such as width, length, height, distance of cable crossings from the coastline, as well as a robust study into the likely impacts of the cable crossings/protection on the marine and coastal receptors and pathways.		6.1.6). It was not considered necessary to repeat that information in the assessment section. To describe the specifications of every potential cable crossing along the length of the export cable would be disproportionate and unnecessary. Instead, standard practice of providing and assessing the worst case total footprint of cable crossings has been undertaken. **ES Chapter 16 Petroleum and Other Marine Users** (document reference 6.1.16) is working to a different set of worst case scenarios and impact pathways compared to this chapter and is not considered to be relevant. In this chapter the morphological effects of all the cable protection including cable crossings is evaluated. Crossings are not extracted individually for their own impact assessment because they are too small,

			relative to the entire length of cable, to warrant this.
Natural England	Comment: Magnitude of effect on seabed morphology and sediment transport under the worst-case scenario for cable protection measures for export cables. Recommendation: What is the rationale behind the assessment of these magnitudes of effect? There could be particular concern regarding the cable crossings shoreward of SEP, for example, where the Hornsea Project Three EC crosses the SEP & DEP EC, and where the Hornsea Project Three EC crosses the SEP EC, and the SOW EC.	No	The assessment looks at all potential cable protection, not just cable crossings. Crossings are integral to the assessment but they are not singled out for individual attention. This would be disproportionate as the crossings are likely to be only a small percentage of the potential protection that will be installed. It is not clear in the comment as to why there is a particular concern at the two crossings mentioned. The rationale for the magnitudes of effects is presented in the text prior to **Table 6-36** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).

Natural England	Comment: Cable protection within Cromer MCZ Recommendation: Reference should also be made here to our response to the MEEB proposals (20 April 2021). Neither DOW nor SOW required cable protection within the MCZ. Therefore, thorough consideration should be given to the need for cable protection within the CSCB MCZ. Any cable protection placed, its installation activities, and cable maintenance activities would hinder the conservation objectives of the MCZ and put pressure on the designated features (e.g. increased suspended sediments, deposition, temporary and/or permanent habitat loss).	No	The quantities of cable protection assessed within this chapter have been refined as far as possible and are based on the Rochdale Envelope approach. This approach provides flexibility in the consent in the absence of detailed ground investigations which are required to enable detailed design decisions such as these to be made. A commitment has been made to only use cable protection at the HDD exit point and up to a maximum of 100m for each of the two export cables inside the MCZ (1,800m^2 in total). A geotechnical survey campaign was undertaken in October 2021, the results of which have fed into the **Outline CSCB MCZ CSIMP** (document reference 9.7).

Natural England	Comment: Impact 7: Cable repairs and reburial Recommendation: We query whether the number of cable repairs and reburials quoted are realistic, for example, one export cable every ten years, one interlink cable every ten years, two infield cable repairs every ten years etc See also comment to Point 343 above on the Cromer MCZ.	No	See response directly above.
Natural England	Comment: Potential Monitoring Requirements Recommendation: Are there Environment Agency surveys which could provide annual/biannual coastal frontage data to ensure no unexpected changes to the beach? Ideally bathymetric & geophysical surveys around sandbanks, near and across the MCZ to ensure that there are no unexpected changes, especially to sensitive receptors. High-resolution swathe bathymetry surveys of scour pits and associated scour protection measures should be undertaken to identify the extent, volume and integrity of any scour protection used. Wave climate (local to regional climate) should be monitored post-construction to understand spatial extent of any changes or to ensure that any changes are as predicted.	No	The monitoring requirements are defined in the **Offshore IPMP** (document reference 9.5) submitted alongside the DCO application and will be further developed and agreed with stakeholders prior to construction. Monitoring of sand wave recovery and secondary scour have been included. Also, as stated, a range of geophysical surveys including bathymetry will be carried out both before and after construction to support other topics, but would also have value in monitoring sedimentary processes/sand bank morphology.

	Sand wave clearance areas along the ECC particularly those near the MCZ and across sandbanks should be monitored (e.g. MBES and/or side scan sonar) to assess cable burial state and to assess recovery of the seabed morphology.		There will be no need for bespoke beach profiles as the landfall is not affected because of installation using long HDD. Even so, the Environment Agency is likely to continue their annual surveys close to the landfall into the future. Numerical modelling of waves has been completed for potential operational impacts due to the presence of the foundation structures (**ES Appendix 6.2 Wave Climate Assessment**, document reference 6.3.6.2). The results show that SEP and DEP are predicted to have only a localised impact on wave climate, where reflection from the wind turbines results in a slight reduction in wave conditions, up to 0.05m significant wave height. There is no impact on the nearshore wave conditions along the East Anglian coast. Therefore, the Applicant considers that there is

			no requirement for wave climate monitoring as the main wave effect will be local to turbines. Any wider effects (wave shadow) will be within the range of natural variability.
Natural England	Comment: Summary of potential impacts on marine geology, oceanography, and physical processes Recommendation: Potential impacts include: • Modification of adjacent or nearby sandbanks • Changes to the wave regime downwind of the array(s), reduction in significant wave height at adjacent coastlines, and concomitant changes to morphological processes • Potential scour around foundations and cable crossings and the need for scour protection • Plume dispersal of suspended sediments • Adverse effect on the integrity of the CSCB MCZ.	No	An assessment of potential impacts on nearby sand banks is now included for the relevant impacts (see **Section 6.6** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6)). Other impacts mentioned are already assessed, apart from scour for the reasons stated in individual responses to comments above.

Natural England	Comment: Numerical modelling of waves and tidal currents with the arrays in place was not carried out. Recommendation: See comment for 8.5.5 Point 97 in Chapter 8 above.	No	See response above.
Natural England	Comment: 'Sediment plume dispersion (particularly the release of chalk fines) during cable installation was also modelled...' Recommendation: These model results should be presented in Chapter 8.		An interpretation of the SOW and DOW sediment plume dispersion modelling results has been provided in **Section 6.6.3.4.1** of **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6).
Natural England	Comment: "Seabed sediments at all sites are similar". Recommendation: See comment for 8.5.7 in Chapter 8. A sediment distribution map should be provided across the entire project area. Whilst there may be considerable areas of medium to coarse sand, sandy gravel, and gravely sand, there are also areas where clay, or clay-rich, sediments are present. A	No	A map showing SOW, DOW, SEP and DEP sediment fractional composition is now included as **Figure 8-2** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).

	detailed and accurate characterisation of the sediments across the project area is essential for understanding the sedimentary, erosional and accretional effects of the project, and the potential for sediment dispersion due to construction and operation activities. Therefore, a sediment distribution map should be provided for the study area.		
Natural England	Comment: Regional suspended sediment concentrations. Concentrations may increase significantly during storm events. Recommendation: Natural England queries the source of the figures. A reference should be provided. The comment regarding suspended sediment concentrations (SSCs) during storms, is vague and needs quantifying. No suspended sediment concentration (SSC) data were measured. Ideally, simultaneous records of SSC, water levels, currents and waves over several tidal cycles would have been collected. Alternatively, modelling of the plume dispersion of dredged or trenched material should have been carried out at different locations along the proposed ECC. For example, close to the array, midway along the ECC (perhaps near Sheringham Shoal sandbank), and close to landfall. This	No	See individual responses to Natural England comments above. Note chapter number has changed to 6 and so the first number of section references is now 6.

	comment ties in with those for Chapter 8, 8.4.6, Point 46, and 8.5.9, Point 132.		
The Wildlife Trust and Norfolk Wildlife Trust	Draft information for the Habitats Regulations Assessment Table 8-1 As stated in our comments on Chapter 12, we welcome the approach by Equinor in engaging with TWT on Sheringham and Dudgeon Extensions during the evidence plan process and we hope that this can continue into the post-consent stage. TWT requests to be named on the piling and UXO MMMP, Site Integrity Plan for the Southern North Sea SAC and any marine mammal monitoring documents (including the In Principle Monitoring Plan).	No	Noted.

The Wildlife Trust and Norfolk Wildlife Trust	Draft information for the Habitats Regulations Assessment Table 8-1 p113 In the response to TWTs comment, Equinor stated that they have provided an assessment against the SNS SAC harbour porpoise estimate in Chapter 12. Can Equinor please indicate where this has been included in Chapter 12?	No	Noted.
The Wildlife Trust and Norfolk Wildlife Trust	Draft information for the Habitats Regulations Assessment Pragraph 686 We appreciate that Defra, the MMO and the Underwater Noise Strategic Advisory Group are taking positive steps to develop effective management for in-combination underwater noise impacts on the Southern North Sea SAC and TWT will continue to work with closely with all stakeholders on this. However, as a regulatory mechanism for managing the in-combination impacts of multiple SIPs is not yet in place, we cannot agree with the in-combination assessment conclusions of no adverse effect on site integrity of the SNS SAC at this current time.	No	Noted.

5 Marine Water and Sediment Quality

Consultee	Comment	Development Change?	Response
North Norfolk District Council	Chapter 9 - Marine Water and Sediment Quality NNDC would defer to the advice of Natural England and the Marine Management Organisation and other experts in respect of matters within this Chapter of the PEIR	No	Noted
Natural England	As per comments to the other chapters, the project parameters are defined by four separate approaches to the project. These are not always clearly defined, particularly with regards to interchanging between the scenarios, for example between interlink and export cables. There is an assumption the reader accepts and can utilise the summarised information provided in reviewing the assessment, however this has proved difficult in our experience. It would be helpful if expanded detail is provided so the reader is able to find the detailed and clear information they need to understand the parameters given for each scenario. Further detail and more transparency for each scenario would enable comparison of the potential impacts for each – SEP in isolation, DEP in isolation, SEP& DEP simultaneous and SEP& DEP sequential. This would enable additional analysis relevant to any mitigation required and any required adjustment to the project parameters. It was not always possible to follow the calculation of the different scenarios. Cross-referencing to the appropriate	No	Further information has been provided in **ES Chapter 4 Project Description** (document reference 6.1.4) and **Table 7-2** to clearly describe the differences between the different options and the reasons for the selection of the WCS. The construction programme for SEP and DEP (built sequentially or concurrently) is not referenced in the WCS table (**Table 7-2**) as it does not have a bearing on the worst case project parameters described in the table. However, where relevant, it is considered in the impact assessment in **Section 7.6** as it does potentially have a bearing on the magnitude of impacts. For each impact

	table / paragraph within Chapter 5 Project description would help. Additional columns detailing the components for the calculations would help.		assessment, where relevant, it is stated whether it is a sequential or concurrent construction programme which is considered to be the worst case for the impact in question. In relation to the grid options for when SEP and DEP are both built, the worst case scenario table (**Table 7-2**) has been differentiated by the number of OSPs required (i.e. one or two) as this determines the worst case footprints and volumes that are assessed. The worst case scenario for each project component for SEP and DEP has been specified in the table to show what has been assessed in **Section 7.6**. With respect to the three distinct array areas, the focus is on identifying and assessing the worst case scenario (in line with the Planning Inspectorate's s51 advice on this matter dated 21 May 2021). In this manner, any differences between the different
Natural England	As above, the WCS not only interchanges between the development options, but also the methodology utilised. Therefore, there is a wide range for WCS. Further transparency or cross referencing to the data used from Chapter 5 is required. In addition, it would be useful to understand the WCS for each of the development scenarios to better understand the implications for each of the four potential options. Also, we advise that the impacts from each of the three distinct array areas is set out separately as well as for the total project.	No	

			areas are assessed by exception. Tables and sections can be found in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7).
Natural England	The plume modelling, as presented in Chapter 7, relies on conceptual studies and previous surveys for the Dudgeon and Sheringham offshore windfarms (OWF). Suspended sediment concentrations are based on HR Wallingford data. Further oceanographic and water quality survey work should be undertaken to establish a more recent baseline.	No	The use of existing data is proportionate to the potential effects on suspended sediment concentrations because most of the sea bed sediments in this area are sand. In these environments, the potential for release of sediment into the water column as a plume is limited as the sediment is too coarse to be lifted off the bed or remain in suspension. Also, ambient suspended sediment concentrations are unlikely to change over time and so the collection of new data would not add value and therefore the use of the existing data is justified.

Natural England	The sampled stations targeted the low variability sea bed type with low proportion of sediment fines (5%). The range of fine material across the site is much greater (up to 22%) and therefore it is possible the true range of baseline contaminant concentrations is mis-represented. The heterogeneity in sediment type should be acknowledged, and any possible further indicative survey or published information to support any inference that can be made should be included. PSA samples were acquired with use of a Hamon grab, for which it is widely accepted can be the most suitable / successful sampling method for mixed sediments. However, the chemistry samples were acquired with a Day grab. The two types of grab differ in that the Hamon grab can result in some mixing of the sediment horizons within the grab, in contrast to the Day grab acquires samples in situ. As such, any link between the sediment properties, notably adsorption/binding capacity of the finer fraction, should be treated with some caution.	No	It was not possible to target areas with the greatest proportion of fines because at the time the sampling strategy was agreed there were no grab sample data on which to base this. The majority of the sea bed sediment samples contained less than 5% mud and almost 100% of the samples contained less than 10% mud. Therefore, the sample containing 22% mud is a single sample from a total 98 samples (i.e. approximately 1% of the samples). Sampling was agreed in advance through the ETG process in April 2020 and the MMO has confirmed the number and sites are appropriate in response to the PEIR (see below). Sampling at offshore wind farms is to confirm the generally accepted principle that offshore sediments are unlikely to be significantly contaminated and the samples collected here are in line with this expectation.

			The survey is indicative only. No further sampling work is therefore planned.
Natural England	The methodology for analysis of sediment samples is appropriate and consistent with CEFAS and MMO guidelines. The comparison of data with CEFAS AL and Canadian SQGL is appropriate. The Applicant also draws on regional information, however further explanation of this context would be useful. The regional context for elevated concentrations recorded off the northeast coast of Norfolk as explored by Whalley et al, 1999 should be acknowledged – as described in this paper, the source may be derived from oil and gas drilling which have arsenic-rich marine shales to the surface, and therefore concentrations are not considered atypical from expected for the region.	No	Comments regarding the methodology are noted. Further information including information from Whalley *et al.,* (1999) has been provided in **Section 7.5.5** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7).
Natural England	The potential pressures/impacts have been identified.	No	Noted.
Natural England	No other projects are listed as the potential for cumulative impact was screened out. This may require review and update if further baseline data is acquired.	No	No further baseline data has been acquired and therefore the CIA remains as that assessed for the PEIR. A check has been made to confirm that no other projects have arisen that require consideration.
Natural England	Construction Impact 1, Please add sea bed preparation volume per turbine to the notes, as presented in Chapter	No	The worst case sea bed preparation volume for a single GBS foundation is for an 18MW

	5, to ensure calculations are transparent within this chapter and between chapters. Using sea bed volume per foundation from Chapter 5 of 16,592m3, the total volumes for GBS foundations slightly differ: x 32= 530944m3 x24 = 398208 and x56 = 929152. This is assumed to be a result of rounded figures presented in Chapter 5. Please confirm that sea surface disposal is at the dredging location. Also related comment: Please clarify that sediment returned to the water column at the sea surface as overflow would be from the vessel position at the GBS foundation location. This ensures sediment is returned to the area of origin and therefore similar sediment type.		turbine (of which there could be up to 19 at SEP and up to 24 at DEP) with a 60m base plate diameter = 16,964.60m^3. This has been reflected in the notes column in **Table 7-2** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7). **Table 4-12** within **ES Chapter 4 Project Description** (document reference 6.1.4) has been updated. Offshore disposal of sediment will take place at or near the sea surface or at the sea bed using a fall pipe in the vicinity of the disposal location. Further information has been provided in the **Disposal Site Characterisation Report** (document reference 9.13) which has been submitted with the DCO application. **Table 7-2** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7) has

			been checked and updated for consistency across chapters.
Natural England	Construction Impact 2: The notes provide the volume per monopile foundation, please also add the volume for the OSP, so the calculations are transparent.	No	The worst case volume of sediment disturbed by OSP monopile foundations has been added to **Table 7-2** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7) for construction impact 2.
Natural England	Construction Impact 3, please check the combined calculation for SEP and DEP together should be 2 x 6,148m3 or justify in the notes column why this not the case. Explain the reason why the volume of disturbance the HDD exit point for SEP and DEP is 700m3 (can cross reference to Chapter 5 project description if required). Under impact 4 is it stated that excavated sediment for sand wave levelling would be disposed of within the SEP and DEP site. It is assumed this also applies to sand wave levelling for the DEP export cable under Impact 3 and should be clarified in the notes section.	No	**Table 7-2** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7) has been updated. As above regarding disposal of sediment.
Natural England	Construction Impact 4, Please add further information to clarify the calculations or cross reference to appropriate information within Chapter 5. For example, the total WCS for sandwave levelling for SEP & DEP together is stated to be 360,200m3, however in Chapter 5 the WCS is stated to be 376,400.	No	**Table 7-2** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7)has been updated. As above regarding disposal of sediment.

	Also, it is noted that it is the intention for excavated sediment from sand wave levelling to be disposed of within the SEP and DEP site. Therefore, there is a distinction between sea bed disturbance (remobilisation and re-suspension) and disposal deposition resulting in suspended sediments). It is assumed cable burial will result in disturbance and re-mobilisation at location and this should be clarified within the notes. Recommendation: Provide further clarification to the scenarios presented. Provide further detail on sea bed disturbance and dispersal in situ and excavated sediment for disposal at a site within the site.		
Natural England	Operation and decommissioning – description of impacts. Update the description of Impacts to be consistent throughout the document.	No	The impact titles have been updated and made consistent between all phases.
Natural England	Operation Impact 1, Please provide transparency in calculation of the area of Worst Case Obstruction using the notes section. Also, provide further information or expanded table to understand the footprint calculation for cable and crossing protection. Recommendation: Provide further clarity or cross reference to appropriate table / paragraph in Chapter 5.	No	Potential scour resulting from SEP and DEP is not assessed because scour protection will be used wherever scour will occur, reducing sediment release to nugatory quantities.

Natural England	We question the Applicant's outline plan to decommission scour protection, crossing and cable protection and possibly offshore cables in situ. Decommissioning should aim to remove infrastructure to avoid irreversible (permanent) habitat loss, thus returning the sea bed habitat to its pre-developed baseline status. However, we recognise there is merit in decommissioning buried infrastructure such as cables in situ to avoid or minimise habitat disturbance. Natural England welcomes that a decommissioning plan will be produced.	No	The Applicant notes that no final decision has yet been made regarding the final decommissioning policy for the offshore project infrastructure. It is also recognised that legislation and industry best practice change over time. External cable protection systems installed within the MCZ will be removed at the decommissioning stage (see the **Outline CSCB MCZ CSIMP** (document reference 9.7)). A Decommissioning Programme will be provided at the pre-construction stage which will further outline the decommissioning strategy in light of more detailed project design information. At the time of decommissioning, a final decommissioning strategy for the project will be developed and will follow the relevant guidance and statutory advice available at the time.

Natural England	Table 9.3 Foundations – micro-siting is mentioned here, with little detail on how the sea bed preparations would be minimised.	No	**Table 7-2** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7) has been updated to reflect that micro-siting around, for example, sand waves would be undertaken to minimise sea bed preparation requirements.
Natural England	Please amend incorrect reference to Table 9-4. Should be to reference Table 9-3	No	The cross reference has been amended.
Natural England	Cables – Natural England welcome the intention to bury cables where possible minimising the requirement for cable protection and scour. Suggest amending the wording 'where burial is required… to 'where burial is undertaken' as it is assumed it is the default approach.	No	This has been amended.
Natural England	Natural England welcomes the intention for a pollution environmental management plan (PEMP)	No	Noted. An **Outline Offshore Project Environmental Management Plan (PEMP)** (document reference 9.10) has been submitted with the DCO application.
Natural England	Can the typical mean winter and summer suspended sediment concentrations be placed into context in terms of water quality? What are the thresholds for which water quality is decreased?	No	There are no water quality standards for suspended solids concentrations. Effects are assessed on the basis of significant changes to the natural baseline.

Natural England	En-3 NPS for Renewable Energy Infrastructure. Under Section reference column for the Potential impacts during construction – please also add and operation and decommissioning	No	This has been amended.
Natural England	Para 9.5.5 Please re-summarise the issue with water quality within 1nm from Section 9.5.1.	No	This has been amended.
Natural England	It is noted that 7 of the 10 intended chemistry samples were successful. Please expand to explain the locations of the three unsuccessful samples. For example, does this explain a gap in information at DEP South, the cable corridor between DEPN and SEP, the northwestern portion of SEP. See comments below regarding Appendix 10.1 and 10.2 regarding station selection – justification of station location selection could be summarised here. The PSA results for the chemistry stations suggest the majority targeted low variability sea bed type with low proportion of sediment fines (5%). Were the sediment types sampled considered representative of the range in encountered across the site?	No	Unsuccessful sample locations and all PSA samples with sediment proportions have been added to **Figure 7.3** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7). The survey was informed by the outputs of the geophysical surveys to cover the proposed wind farm extensions and cable corridors. It was not possible to target areas with the greatest proportion of fines because at the time the sampling strategy was agreed there were no grab sample data on which to base this. **Figure 7.3** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference

			6.1.7) has been updated to show all sample results for PSA showing good coverage of the study area and illustrates that the majority of the sea bed sediment samples contained less than 5% mud and almost 100% of the samples contained less than 10% mud. So, the sample containing 22% mud is a single sample from a total of 98 samples (i.e. approximately 1% of the samples).
Natural England	For clarity, it could be explained here it is the low proportion of fine material to which contaminants bind or adsorb to that reduces the potential to accumulate. To demonstrate this link, the proportion of fines, gravel and sand could be included in the results Table 9-14. However, while we do not disagree with the generalised conclusion regarding the dominance of sand and gravels and their link to sediment retention, examination of Appendix 10.1 and 10.2 Benthic report notes that a few stations recorded higher proportions of fine sediment notably EC-16 (22%), SS-10 (9%) SS-19 (17%), SS-23 (13%) and D-07 (10%) in areas of mixed sediment. As chemistry samples were not acquired at these stations, it is not possible to establish any baseline variation in sediment chemistry associated with these higher proportions of finer material, with	No	Further explanation has been added to **Section 7.5.3** and **Figure 7.3** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7) has been updated. As described in response to the previous comment, the majority of the sea bed sediment samples contain less than 5% mud and almost 100% of the samples contained less than 10% mud. So, the sample containing 22% mud is a single sample from a total of 98 samples (i.e. approximately 1% of the

	consideration a bioavailable aqua regia digest was utilised for metals analyses. Therefore, it is possible the true range of baseline contaminant concentrations is mis-represented.		samples). It is therefore considered that the baseline contaminant concentrations are a true reflection of sediments across the study area.
Natural England	Does the plume concentration account for the maximum proportion of finer sediment recorded (23%)? Can the direction of the plume be anticipated as paragraph 80?	No	The majority of the sea bed sediment samples contain less than 5% mud and almost 100% of the samples contained less than 10% mud. So, the samples containing higher proportions of mud, for example the sample showing 22% mud is a single sample from a total of 98 samples (i.e. approximately 1% of the samples) and it would be unrealistic in the worst-case scenario to account for this one sample. However, even so, the dimensions of, and concentrations in, the plume are assessed conceptually, and not using a numerical model. Hence, they are only semi-quantitative based on the evidence base for similar sea bed substrates. The potential plume directions are described in **Section 7.6.1.2.1** in **ES Chapter 7 Marine Water**

			and Sediment Quality (document reference 6.1.7), and the initial direction will depend on when construction activities begin relative to the tidal cycle.
Natural England	If dredged material is surface released at the GBS foundation site, then the plumes are unlikely to interact. Please clarify if this is not the case. Further the suspended sediment plume increase for SEP and DEP together is stated to be less than 10mg/l, however the increase for SEP or DEP in isolation in paragraph 76 is cited to be tens of mg/l. This seems contradictory.	No	The worst case assumes that dredged material would be released at or near to the surface. The impact assessment has been amended (see **Section 7.6.1.2.1** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7)).
Natural England	What is the length of cable route that would potentially result in the release of chalk fines into the water column? Is subcropping chalk known to occur to the west in the direction of the plume?	No	The geology of SEP and DEP, including the offshore export cable corridor, consists of Holocene deposits overlying a series of Pleistocene sands and clays, with a bedrock of Upper Cretaceous Chalk. It is not possible to specify the length of the cable corridor that would potentially result in the release of chalk fines into the water column, as this depends on the thickness of the overlying unit of sand and gravel. However, the assessment is based on a worst

			case scenario where all the displaced sediment is assumed to be suspended, although in reality, due to the low proportion of mud/fines in the areas concerned, only a small proportion of disturbed sediments will be suspended for any length of time, if at all. The **Outline CSCB MCZ CSIMP** (document reference 9.7) provides further detail on offshore export cable installation within the Cromer Shoal Chalk Beds MCZ. In addition, an interpretation of the Sheringham Shoal Offshore Wind Farm (SOW) and Dudgeon Offshore Wind Farm (DOW) sediment plume dispersion modelling results has been provided in **Section 7.6.1.3.1** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7).

Natural England	The depth of disturbance is defined in 9.6.1.4.1. Please also define the width of disturbance. Please define what is considered a “small proportion of disturbed sediments”	No	The depth and width of cable burial with respect to displacement of sediment has been defined in **Table 7-2** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7).
Natural England	Paragraph 94 highlights the WCS of sediment returned to the water column at the sea surface and that this would occur within the DEP wind farm site and cable corridor. It should be stated here if surface disposal will be at the locality of dredging or redeposited at a disposal site within the windfarm boundary (as described in Chapter 5 para 147). If it is the latter, further detail is required as to the volume and frequency of disposal as this would affect the suspended sediment concentration. Please also see our comments in relation to Chapter 7 and the importance of maintaining the sandbanks in this area.	No	Excavated sediment will be redeposited within the wind farm sites and/or cable corridors and where possible in an adjacent area of sea bed with similar sediment type. **ES Chapter 4 Project Description** (document reference 6.1.4) and **Section 7.6.1.1** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7) have been updated. Responses to Natural England’s comments on **ES Chapter 6 Marine Geology, Oceanography and Physical Processes** (document reference 6.1.6) are provided in that chapter. Sandbanks have been added as a sensitive receptor

			within the Chapter 6 assessment.
Natural England	We welcome the intention for monitoring to be outlined within an In-principle Monitoring Plan (IPMP). We consider sediment and water quality monitoring is not required.	No	Noted. The **Offshore IPMP** (document reference 9.5) has been submitted with the DCO application. Provision for monitoring of water and sediment quality has not been included.
Natural England	Re Figure 9.3, it would be useful to have included the sediment pie charts to illustrate the fines, sand, and gravel proportions at the sediment chemistry sample locations.	No	The sediment fractional composition of the sediment samples has been added to **Figure 7.3** in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7).
MMO	The MMO note that evidence used for the PEIR comprises ten sediment samples which were collected to support a Benthic Ecology Survey. Seven of these samples were analysed for a selection of contaminants, as, the applicant states, three samples could not recover an adequate volume of sediment due to rock obstructions present in the sampling methods. Under the Oslo and Paris Convention (OSPAR) guidelines, seven samples would represent approximately 100,000 m^3 of dredging or sediment disturbance. Table 9-1 details the realistic Worst-Case scenario design parameters, and states that the total	No	The Applicant notes and welcomes that the MMO consider adequate evidence has been gathered and presented which show that the working area (array and cable corridors) is sufficiently coarse so as not to warrant additional contaminant analysis, and that the area is likely low risk for contaminant release.

	worst-case volume of sediment which would be disturbed is 929,126 m³ for sea bed preparation, 220,442 m³ for the export cabling, and 774,200 m³ for the infield cabling, if SEP and DEP were constructed concurrently. Therefore, under the OSPAR guidelines, the sampling which has been conducted greatly underrepresents the volumes proposed. However, contaminant sampling under the OSPAR guidelines can be reduced or even vetoed altogether if the sediment to be disturbed is sufficiently coarse. Coarse-grained sediments, such as sand and gravel, have a reduced affinity for sorbing contaminants when compared with fine-grained sediments such as silts, and so, if an area of sediment is shown to be sufficiently coarse, it may not need to be sampled for contaminants. Chapter 8 of the PEIR (section 8.5) details the results of a grab-sampling campaign conducted by Fugro (August 2020), where 98 sea bed samples were taken and analysed for particle size. MMO could not ascertain the depth from which these samples were taken, and so, for the purpose of this exercise, assume that they were surficial samples (0 m depth). These 98 samples provide adequate spatial representation of the working area as relevant to the OSPAR guidelines based on the volumes proposed. The MMO note that the data presented indicate very low levels of contaminants (trace metals, organotins, Polycyclic Aromatic Hydrocarbons [PAHs]) in the offshore sediments. Based on the information presented, the MMO agree with the Applicants conclusion that the levels presented appear very low. Given the points outlined		

	above and the assumptions made the MMO, in consultation with its scientific advisors Cefas, consider adequate evidence has been gathered and presented which show that the working area (array and cable corridors) is sufficiently coarse so as not to warrant additional contaminant analysis, and that the area is likely low risk for contaminant release. The report discusses potential embedded mitigation measures. At this early stage of the application process, MMO would not expect mitigation to be finalised, and do not currently recommend any based on the sediment data presented.		
MMO	The MMO were unable to locate any information detailing which laboratory was contracted to perform the various analyses, and which methods were used for detection. This is a key point, as different analytical methods can lead to widely varying results, particularly for some analyses such as Total Hydrocarbon Content. The MMO request that this point is clarified before drafting their Environmental Statement (ES). The Applicant appears to have tested for the United States Environmental Protection Agency (US EPA) list of 16 priority PAH congeners. Whilst this comprises most PAHs of concern in the UK, it notably omits several congeners (e.g., C-group Naphthalenes) which are essential to determining risk to the marine environment. The MMO suggest that the PEIR is modified to more accurately reflect that PAHs tested for comprise the US EPA 16 PAHs, and are not comprehensive of PAH congeners routinely tested for in	No	The Applicant confirmed at the Sea bed ETG4 meeting that Fugro undertook the sediment contaminant analysis (see **Section 7.4.2.1**). Reference to EPA priority list has been added (see **Section 7.5.4**). The mud fraction is confirmed to be particles less than 63 micrometres. Both sections can be found in **ES Chapter 7 Marine Water and Sediment Quality** (document reference 6.1.7).

	the UK. The results show that samples were mostly medium sand to fine gravels (0.3 millimetres 'mm' to 4.2mm), with less than 10% "mud" in all samples. The report does not appear to specify the sediment range that "mud" is described as, though the MMO presume that it is ~63 micrometres (µm): Further clarification is recommended.		

6 Benthic Ecology

Consultee	Comment	Development Change?	Responses
North Norfolk Coast District Council	NNDC would defer to the advice of Natural England and the Marine Management Organisation and other experts in respect of matters within this Chapter of the PEIR.	No	Noted.
Natural England	Project Definition: The SEP and DEP together options result in confusion in defining the integrated and separated grid options, with the option for sequential or simultaneous build. Further, DEP is split into two areas, DEPN and DEPS, with resulting variation in interlink / export cable corridor options.	No	Further information has been provided in **ES Chapter 4 Project Description** (document reference 6.1.4) and **Table 8-2** to clearly describe the differences between the different options and the reasons for the selection of the WCS.
Natural England	WCS:	No	

	The WCS for SEP and DEP together includes options for separated or integrated options, built sequentially or simultaneously. The WCS interchanges between these options and for clarity, the WCS for each 'together' option would be better presented as a separate column in the relevant table of impacts. This would help in the event that one of the options becomes an obvious choice for development.		The construction programme for SEP and DEP (built sequentially or concurrently) is not referenced in the WCS table (**Table 8-2**) as it does not have a bearing on the worst case project parameters. However, where relevant, it is considered in the impact assessment in **Section** as it does have a bearing on the magnitude of impacts. Where relevant, within each impact assessment it is stated whether it is a sequential or concurrent construction programme depending on which is considered to be the worst case for the impact in question. In relation to the grid options when SEP and DEP are both built, the worst case scenario table (**Table 8-2**) has been differentiated by the number of OSPs required (i.e. one or two) as this determines the worst
Natural England	Section 10.3.2.1 As comments on Chapter 5 Project Description, the WCS for SEP and DEP together includes options for separate or integrated options, built sequentially or simultaneously. The WCS interchanges between these options and for clarity, the WCS for each of these options would be better presented as a separate column.	No	
TWT	It is important that the worst-case scenarios are assessed. TWT is happy to discuss and consider realistic worst-case scenarios as long as this is the limit to be included in the DCO.	No	

			case footprints and volumes that are assessed. The worst case scenario for each project component for SEP and DEP has been specified in the table to show what has been assessed as a worst case in **Section 8.6**. Tables and Sections found in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8)
Natural England	Natural England position on WCS: Natural England does not agree with all WCS presented in this chapter mainly due to lack of clarity or apparent miscalculations.	No	The WCS have been updated in in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8). Further information has been provided in **Chapter 4 Project Description** (document reference 6.1.4)**.**
Natural England	Assessment conclusion: until greater clarity is presented on the impacts it is difficult for NE to agree with the conclusions.	No	
Natural England	10.3.2.1 / Table 10-2 Construction Impact 1: DEP in isolation is cited as 267km–the length of cables from the breakdown in this column (62km + 135km +66km) totals 263km.	No	Noted, this has been amended in **Table 8-2** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	10.3.2.1 / Table 10-2	No	Further information has been provided in **ES Chapter 4**

	The calculations summarised within this table require acceptance that the calculations are correct. Details of the parameters or calculations should be included for transparency. Whilst most can be cross checked, not all are possible. It would also be helpful to cross reference to the appropriate paragraph/table within Chapter 5 or to provide expanded detail.		**Project Description** (document reference 6.1.4) and **Table 8-2** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	10.3.3.1 / Table 10-3 Sediment disposal. We welcome the intention for sediment disposal to return material within the MCZ at or close to the source, to ensure that it remains within the site. Further, we welcome the intention that sediment will be deposited within an area of similar sediment type, site to ensure any sensitive habitats are avoided. Natural England would welcome the opportunity to be consulted on the location of any such disposal site as part of the pre-application process	No	Offshore disposal of sediment will take place within tens of meters of the source, either near the sea bed or at the sea surface. Further information has been provided in the **Disposal Site Characterisation Report** (document reference 9.13) which has been submitted with the DCO application.
TWT	Rock bags: TWT would like to see evidence to support the use of rock bags as the cable protection method which will a) cause minimal habitat loss and b) can	No	If external cable protection is required in the CSCB MCZ, the Applicant is proposing to install removable external cable

	be confidently decommissioned. TWT cannot agree with the conclusion of the assessment in paragraph 250 until further information is provided.		protection systems (e.g. rock bags) within the CSCB MCZ and has committed to removal, if required, at decommissioning (see **Table 8-24** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8) and the **Stage 1 CSCB MCZA** (document reference 5.6)). This ensures no permanent habitat loss within the MCZ. Further information is provided in the **Outline CSCB MCZ CSIMP** (document reference 9.7) and associated appendices. **Appendix 9.7.3 Cable Protection Decommissioning Feasibility Study** (document reference 9.7.3) of the **Outline CSCB MCZ CSIMP** describes the decommissioning feasibility of the removable external cable protection systems anticipated to be installed within the MCZ.
TWT	TWT is pleased that HDD will be implements to avoid impacts to chalk	No	The Applicant is confident that HDD can extend to

	features. Is Equinor confident that HDD can extend approximately 1000m offshore? And will this avoid all nearshore chalk features?		approximately 1,000m from shore and that this will ensure avoidance of the nearshore outcropping chalk feature shown on **Figure 8.6** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8). Geophysical surveys indicate that the nearshore outcropping chalk feature extends approximately 480m at its minimum extent and 890m at its maximum extent from Mean Low Water Springs (MLWS) and therefore the feature will be avoided through HDD. Further information on cable installation in the nearshore area is provided within the **Outline CSCB MCZ CSIMP** (document reference 9.7) and further detail on the proposed landfall installation methodology is provided in **Appendix 3.2 Cable Landfall Concept Study**

			(document reference 6.3.3.2) of **ES Chapter 3 Site Selection and Assessment of Alternatives** (document reference 6.1.3)**.**
TWT	Construction scenario: TWT welcome that Sheringham and Dudgeon will share a cable corridor. However, habitats will encounter repeated disturbance if projects are constructed separately. To reduce this impact, what extra commitments could Equinor make?	No	The Applicant's intention is to build both projects concurrently however flexibility is required within the consent in case this approach is not feasible (as set out in **ES Chapter 4 Project Description** (document reference 6.1.4)). From an offshore/benthic ecology perspective, the impacts from cable installation, accounting for a sequential construction, are anticipated to be temporary, minor, and not significant. Therefore, no additional measures to those already included in the assessment (**Sections 8.6.2.1** and **8.6.2.2** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8)) are required.

Natural England	Baseline characterisation: The survey methodology is appropriate	No	Noted.
Natural England	Data Gap: In areas where sample attempts failed due to the coarse nature of the sediment, sediment samples for chemical analysis were not acquired.	No	Where sampling failed in coarse sediment locations, a second attempt was made, the majority of which also failed due to the nature of the sediments. As part of consultation on survey design, stakeholders advised that repeat sampling should be kept to a minimum to reduce impacts on habitats, particularly in the MCZ. It is considered the current sampling is adequate in this respect, especially given that any contaminants do not persist in coarse sediments and that reasonable endeavours were made to obtain samples in these locations. Sampling was agreed in advance during earlier ETG meetings and the MMO have confirmed the number and sites are appropriate in response to the PEIR. Therefore, no further

			sampling has been undertaken to inform the DCO application. Further information has been provided in **Section 8.5.2** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	Section 10.4.2.2: The sampling strategy could be summarised here. For example, the rationale for station selection by the Applicant being based on review of geophysical data ensuring representative coverage of the variation in potential habitat types. Consideration was also given to existing sample data, particularly where sensitive habitats were identified, from Marine Recorder (JNCC), National Biodiversity Network (NBN) and Eastern IFCA. This information does not translate through to Appendix 10.1 and 10.2 other than a broad description in Table 2.1 (without the source). Rather than describing agreement with Natural England and the MMO, the methodology for survey strategy should be described and summarised within these paragraphs for the benefit of other interested parties and for clarity moving forward. Also, were	No	Further information on the survey strategy has been provided in **Section 8.4.2.2** and within **ES Appendix 8.1 DEP Benthic Characterisation Report** (document reference 6.3.8.1) and **ES Appendix 8.2 SEP Benthic Characterisation Report** (document reference 6.3.8.2), including references to previous survey data which informed the sampling strategy. Notes have been added in **ES Appendix 8.1** and **ES Appendix 8.2** to stations D_12 to D_14 and SS_13 to SS_17, SS_20, SS_22 and EC_06 to detail the origins of the previous *S. spinulosa* records that were used to select sample locations. The relevant

	all samples successfully required? If not, why was this? From comparison of Figure 10.1 we know that D-04, CC-04 or SS-18 chemistry were not acquired due to coarse nature of the sediment – this is explained later in Section 10.5.2 (paragraph 64).		references have been added to the reference list. Further information on why contaminant samples were not collected at three stations has been provided in **Section 8.5.2.** In addition, **Figure 8.1** has been updated to only show locations where samples were collected. Sections can be found in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8)
Natural England	Appendix 10.1 and 10.2 | Section 2 / Table 2 The table states that a chemistry sample was acquired at EC-07 – the sample was in fact acquired at EC-05 – according to the logs and the results.	No	The tables are correct. **Table 2-1** in **ES Appendix 8.1 DEP Benthic Characterisation Report** (document reference 6.3.8.1) and **ES Appendix 8.2 SEP Benthic Characterisation Report** (document reference 6.3.8.2) shows the planned survey locations and **Table 4.2** shows the completed survey locations. Text has been added to **section 4.1.3** in **ES Appendix 8.1** and **section 4.1.2** in **ES Appendix 8.2** to detail the move

			of the sampling location from EC_07 to EC_05 to a more suitable sediment type
Natural England	Appendix 10.1 and 10.2 | Table 2.1 The rationale for sediment sampling column suggests the location of several of the stations e.g. D10, D-11 and D-12 were chosen where previous samples included existing records of Sabellaria spinulosa. Further detail on the source of the existing records should be added.	No	Further information has been provided in **ES Appendix 8.1 DEP Benthic Characterisation Report** (document reference 6.3.8.1) and **ES Appendix 8.2 SEP Benthic Characterisation Report** (document reference 6.3.8.1) in relation to the previous survey data which was used to determine the sampling strategy. Notes have been added to stations D_12 to D_14 and SS_13 to SS_17, SS_20, SS_22 and EC_06 to detail the origins of the previous *S. spinulosa* records. The relevant references have been added to the reference list.
Natural England	Section 10.5.2 PEL description. Please amend Probably to Probable as to read Probable Effects Level (PEL). The meaning of concentrations within this range is missing	No	The reference to PEL and a description of both PEL and TEL have been provided in **Section 8.5.2**.

	– 'the possible effect range within which adverse effects occasionally occur'. In addition to the quoted range for uncontaminated sediments from Neff, 1997, the regional context for elevated As concentrations recorded off the northeast coast of Norfolk as explored by Whalley et al should be acknowledged. Within this paper, Whalley et al suggest: "the source may be derived from oil and gas drilling which have arsenic-rich marine shales to the surface, and therefore concentrations are not considered atypical from expected for the region".		Reference to Whalley *et al*., 1999 has also been included in **Section 8.5.2**. Both sections can be found in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	Section 10.5.4 | Table 10-14 Adding the station names to SEP and DEP (N/S), as with the export cable corridor would enable an understanding of the proportion of the stations where these habitats/biotopes occur. Within the 'Recorded in DEP column? ' for A5.611, please state the survey type as well as/instead of the reference (Fugro2020a and 2020b) – benthic or habitat report, and within the export cable corridor please state the transect/station(s) where A5.611 Sabellaria spinulosa on stable circalittoral	No	**Table 8-14** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8) has been amended with the station names that were identified for each biotope.

	mixed sediment occurs along with A5.431.Also, within the' Recorded in SEP? column', amend description of within group A to be consistent with the other habitats by naming/describing the stations where 'Possible A5.611 identified in all SEP project areas with A5.431'.		
Natural England	Section 10.6.3.1.1 It should also be added to this paragraph, the statement from Section 10.6.2.1 that "Like the Dudgeon OWF post-construction survey, year one and two post construction surveys of the Sheringham Shoal OWF site showed likely recovery within two years in most areas (Fugro, 2013; 2014). However, the offshore export cable trenches in coarse sediment areas still represented a disturbed benthic habitat by the time of the second post-construction monitoring survey."	No	The information relating to the Sheringham Shoal OWF (SOW) and (DOW) monitoring surveys is described in **Section 8.6.2.1.** **Section 4.3.1.1** of the **Outline CSCB MCZ CSIMP** (document reference 9.7) describes why slower recovery of the export cable trenches occurred for SOW. The SEP and DEP export cable corridor runs parallel to the DOW export cable corridor. The Applicant will make reasonable endeavours to use a similar export cable installation methodology to that project. Post-construction surveys did not show any exposed export cables, nor visibility of the

			trenched route on the sea bed for the DOW (see **Section 4.3.1.2** of the **Outline CSCB MCZ CSIMP** (document reference 9.7). Therefore, a full recovery for SEP and DEP is anticipated in less than four years. **Section 8.6.3.1.1** includes a cross reference to **Section 8.6.2.1** which has been updated to provide further detail. Unattributed Sections can be found in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8)
MMO	The MMO agree that the habitats and biotopes identified as potential receptors in Section 10.5.4 are appropriate as well as the potential impacts of pressures associated with the proposed works as assessed in Section 10.6.	No	Noted.
Natural England	Identified impacts: Marine Evidence Based Sensitivity Assessment (MarESA) sensitivities guidance followed	No	Noted.

Natural England	Section 10.4.3.1.2 Paragraph 44. Value. Natural England disagree with the differentiation of protected habitats. Habitats protected under national law broadly afford the same protected status as those under international law, and MCZ and UK Priority habitats for example should be included as being of 'high' value. This would be consistent with Chapter 6 EIA methodology Paragraph 47, Table 6-2 of the assessment, where nationally important protected sites are listed as high value.	No	The value of national designations has been increased to high in **Table 8-9** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8), including the CSCB MCZ.
Natural England	Section 10.4.3.1.2 Value. Natural England disagrees with the differentiation of protected habitats. Habitats protected under national law afford broadly the same protected status as those under international law and for example MCZ and UK Priority habitats should be included as being of 'high' value. This would be consistent with Chapter 6 EIA methodology Paragraph 47, Table 6-2 of the assessment, where nationally important protected sites are listed as high value. The source of the	No	

	assigned definitions within this table should be included if there is justification.		
Natural England	Section 10.6.2.1.4 Based on comments to paragraph 44, consideration should be given to the value of the habitats within the MCZ being modified to 'high' given the nationally protected status of the site.	No	
TWT	TWT does not agree with the value levels. SACs and MCZs both form part of the Marine Protected Areas (MPA) network, and therefore should be treated the same. If not, substandard assessment and management will be applied to MCZs thus placing the MPA network at risk. Both SACs and MCZs should be valued as high.	No	
Natural England	Section 10.6.3.3.1 Natural England disagrees with the sensitivity value adjustment within the MCZ as the habitat is of National Importance. Natural England advises the value is adjusted to be 'high' as listed in Chapter 6 paragraph 47 Table 6.2	No	The value of national designations has been increased to high as shown in **Table 8-9**, including the CSCB MCZ. This has been referenced in **Section .** Section and table can be found in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8)

Natural England	Section 10.6.3.3.1 Within the MCZ, if the sensitivity is amended to 'high' the impact of significance would be 'moderate adverse'. As such mitigation options to avoid cable protection where possible, should be outlined.	No	As above, the value of national designations has been increased to high as shown in , including the CSCB MCZ. This has been referenced in **Section 8.6.3.3.1**. Mitigation measures (**Table 8-4**) have been incorporated into the impact assessment where applicable, following the mitigation hierarchy of avoid, minimise, mitigate. Section and table can be found in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	Section 10.4.3.1.3 The definitions used here for Magnitude (Table 10-10) are listed in Chapter 6 EIA methodology para 53 Table 6-4 as the 'Impact significance definitions. Conversely, the impact significance definitions in Table 10-12 of this chapter are not listed as such in the Chapter 6 EIA. The impact significance includes consideration of 'value' in the description and the expanded definitions should be explained.	No	The example criteria for Impact Significance provided within **ES Chapter 5 EIA Methodology** (document reference 6.1.5) of the PEIR should have been assigned to Magnitude of Effect and therefore Chapter 5 has been amended. Receptor specific amendments have been made to the EIA methodology and associated definitions in each chapter where

			relevant. Value has already been incorporated into the impact significance definitions provided in **Table 8-12** of **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	Section 10.6.2.1 Construction impact 1: Suggest stating the MarESA pressure type in this paragraph that is considered an operational long term or permanent and covered in Section 10.6.3.2, namely “Physical change (to another substratum type).”	No	Physical change (to another substratum type) is considered to be a long term or permanent pressure however construction impact 1 is temporary habitat loss/ disturbance therefore it is considered that the pressures listed in construction Impact 1 (**Section 8.6.2.1** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8)) are the appropriate pressures from MarESA and no changes have been made.
Natural England	Section 10.6.2.1.4 Natural England disagrees with the magnitude of effect within the MCZ as negligible, given the protected status of the site. Further given the value of habitats within the MCZ Natural England	No	Magnitude of effect relates to (for example) the area/proportion of the receptor impacted and the duration of the impact, rather than the protected status or value of a receptor. The latter is

	would consider the Impact Significance to be at least minor adverse at least.		accounted for in the sensitivity assessment. The sensitivity of habitats that may be impacted is assessed as medium based on consideration of both value and sensitivity from MarESA. However, it should be noted that the assessment conclusion for this impact and receptor is already minor adverse (**Section 8.6.2.1.5** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8)).
Natural England	Section 10.6.3.1.2 See above comments to paragraphs 156 and 158. Further, given the value of habitats within the MCZ, Natural England would consider the Impact Significance to be moderate adverse at least.	No	Consideration of the high value of the MCZ has been undertaken for the impact assessment in **Section 8.6.2.1.5**. Justification for a medium sensitivity of habitats and biotopes is provided in **Section 8.6.2.1.5** and is considered appropriate for this impact. Therefore, based on the medium sensitivity and negligible magnitude of temporary habitat loss/physical disturbance, the

			impact is assessed as minor adverse. Both sections can be found in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	Section 10.6.2.5.1 Add high sensitivity for A5.451 Polychaete-rich deep Venus community in offshore mixed sediments	No	The biotope A5.451 has not been added to **Section 8.6.2.5.2** since this biotope was not recorded within the DEP wind farm site or the offshore export cable corridor. However, this biotope was recorded in the SEP wind farm site and is assessed as being of high sensitivity to INNS (**Section 8.6.2.5.3**). **Table 8-14** provides a summary of the biotopes identified and their locations. Sections and table can be found in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8)
Natural England	Section 10.6.3.1.1 Natural England disagrees with the statement that S. spinulosa reef is unlikely to form naturally within the project area.	No	Baseline surveys for SOW, DOW, SEP and DEP (which included ground-truthing drop-down video surveys) and the

	The presence of circalittoral mixed sediments coupled with the observed presence of patches of Sabellaria sp, means there is the potential that reef could be present within the survey area or emerge in the future and this should be considered during all phases of the project. Given the nationally protected status as a UK BAP priority habitat, the evaluation of the value of this habitat should be reconsidered		pre- and post-construction monitoring surveys for SOW and DOW, found no UK BAP priority habitat / Annex I habitat *S. spinulosa* reef. Based on this, the Applicant considers that it is unlikely that UK BAP priority habitat / Annex I *S. spinulosa* reef is present within either of the sites. Reference to *S. spinulosa* reef being unlikely to form naturally within the area has been updated (**Section 8.6.3.1.1**) to make it clear that this relates to UK BAP priority habitat / Annex I *S. spinulosa* reef only. The locations of potential future UK BAP priority habitat / Annex I *S. spinulosa* reef are unknown, however it is anticipated that if it was to form that it would be identified during pre- or post-construction monitoring surveys

			and could be subsequently avoided, as required. The value of UK BAP / Annex I habitats has been increased to high (**Table 8-9**). Table and section can be found in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	Section 10.6.3.2 Impact 2 Permanent Habitat Loss: Natural England disagrees with the change of the sensitivity to medium for all the biotopes within Table 10-20. Most notably for the UK BAP protected habitats A4.231 Piddocks with a sparse associated fauna in sublittoral very soft chalk or clay and A5.611 S. spinulosa on stable circalittoral mixed sediment the sensitivity should remain high'.	No	The MarESA pressure that represents permanent habitat loss is 'physical change (to another sediment type), which is described as removal of a biotope permanently. Evidence has been provided in **Section 8.6.3.2** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8) showing that the biotopes are present elsewhere in the southern North Sea and are not limited to the footprint of the permanent habitat loss. Therefore, MarESA pressure of biotope removal is not entirely representative of the impact,

			given the biotope is not entirely removed. The sensitivity of biotopes from this MarESA pressure has therefore been reduced from high to medium in acknowledgement of the biotope still being present in some locations. However, taking into account the particular sensitivity and value of the Annex I / UK BAP priority habitat *S. spinulosa* reefs that can be associated with biotope A5.611 and the UK BAP priority habitat 'peat and clay exposures with piddocks' which can be associated with biotope A4.231, these designated habitats will remain as high sensitivity for this MarESA pressure. Baseline surveys for SOW, DOW, SEP and DEP (which included ground-truthing drop-down video surveys) and the pre- and post-construction monitoring surveys for SOW and

			DOW, found no Annex I / UK BAP priority habitat *S. spinulosa* reef. Based on this, the Applicant considers that it is unlikely that Annex I / UK BAP priority habitat *S. spinulosa* reef is present within any of the sites.
MMO	The MMO do not currently agree with the reduction of receptor sensitivity from 'high' to 'medium' relating to permanent and long-term habitat loss during the operational phase (Section 10.6.3.2 and 10.6.3.3). It is reasoned that because the relevant biotopes are known to be present across the wider area in the southern North Sea, the sensitivity can be considered 'medium' rather than 'high'. This may be a reasonable decision, it does not appear that this procedure has been applied to other assessments (e.g. sensitivity to temporary physical disturbance during construction; Section 10.6.2.1.3). The MMO would appreciate further clarification on this point. The assessment should also refer to the evidence that shows that the relevant	No	Evidence has been provided in **Section 8.6.3.2** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8) showing that the biotopes are present elsewhere in the southern North Sea and are not limited to the footprint of the permanent habitat loss. This approach has not been applied to other sensitivity assessments as it is only relevant to the MarESA pressure that represents permanent habitat loss 'physical change (to another sediment type)'. The MarESA pressure describes a removal of a biotope permanently. However, as evidence has been provided

	biotopes are present across the wider Southern North Sea area.		showing these biotopes are present in other areas of the southern North Sea including in the vicinity of SEP and DEP, the biotope will not be entirely removed in this case. Therefore, the MarESA pressure of biotope removal is not entirely representative of the impact, given the biotope is not entirely removed. The sensitivity of biotopes from this MarESA pressure has therefore been reduced from high to medium in acknowledgement of the biotope still being present in some locations.
MMO	The applicant has considered that the impact magnitude for temporary physical disturbance during the construction phase as 'negligible' (Section 10.6.2.1), however, as around 2.5 kilometres squared (km2) of sea bed would be disturbed (Table 10-2). The MMO consider a higher impact magnitude (e.g. 'low') would be more appropriate in this instance. It is noted that the criteria used to define the different	No	The estimated area of temporary habitat loss/ physical disturbance has been increased from 2.5km^2 to 7.83km^2, primarily due to the estimated width of disturbance from cable installation being increased from 3m to 15m on a precautionary, worst case basis. A review of other offshore wind farm developments has

	levels of impact magnitude in the PEIR are not quantitative (Table 10-10), with 'negligible' implied when the impact occurs "over a small area of the receptor", which is open to subjectivity. The Applicant should confirm that a 'negligible' impact magnitude is consistent with the conclusions made for other developments that have had similar footprints of temporary physical disturbance.		been undertaken and it is considered that low impact magnitude is appropriate for this scale of temporary habitat loss / physical disturbance. **Section 8.6.2.1** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8) has been updated to reflect this.
EIFCA	EIFCA would welcome further dialogue to better understand the basis to the following statement - "132. As described in Section 10.3.3, there will be no direct impacts on the intertidal zone as a result of the use of HDD to approximately 1,000m from the coastline. Additionally, the assessment provided in Chapter 8 Marine Geology, Oceanography and Physical Processes concludes that there will be no significant indirect impacts on the nearshore environment. Therefore, no impacts are predicted on the intertidal zone and it is not considered further in this chapter." Please be aware that the "EIFCA Restricted area 35 (closed to bottom	No	Intertidal habitats have been scoped out of the assessment due to there being no pathway for impact to intertidal habitats due to the use of HDD to approximately 1,000m offshore in the subtidal (**Table 8-3**). This was agreed at the sea bed ETG4 meeting on the 16th of August 2021 with Natural England and the MMO and EIFCA deferred to Natural England on this point. Further information has been included on embedded mitigation in **Table 8-3** in relation to why

	towed gear)" you refer to on page 108 is not yet "Active" it has been agreed by our Authority however it has not been signed off by the Secretary of State. (We do have an active restricted area 35 in the 2018 version of this byelaw however it does not coincide with this project.		there will be no impacts in the intertidal zone. The reference to Restricted area 35 in **Table 8-23** has been updated to show it is not yet active. Both tables can be found in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
TWT	Impacts during construction - sandwave levelling: TWT would like to know if sandwave levelling occurred during the installation of the existing Sheringham and Dudgeon Offshore Wind Farms and see evidence of recovery from this activity. We cannot agree with the assessment conclusions until further information has been provided.	No	No sand wave levelling was undertaken at SOW and DOW. During DOW infield cable installation, a trench was jetted through a small sand wave however no dredging / levelling of sand waves was undertaken. Post construction monitoring was carried out throughout the arrays and export cables. Discussion of the monitoring that was undertaken is included in the assessment of this impact (**Section 8.6.2.1**). Race Bank offshore wind farm conducted monitoring of sand

			waves where crests were reduced in elevation. The monitoring showed greater than 75% recovery of all sand waves monitored. More information is available in **Section 8.6.2.1.2**. Monitoring of sand wave recovery following their clearance, if required, is included in the **Offshore In Principle Monitoring Plan (IPMP)** (document reference 9.5). Both sections can be found in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	Data analysis: Although the habitat assessment is summarised within Appendix 10.1 and 10.2, it was not included as a separate appendix to Chapter 10.-Appendix 10.1 and Appendix 10.2 suggests chalk reef assessment was not undertaken due to lack of a defined method. Paragraph 106 of Chapter 10 and Appendix 10.1 and 10.2, Section 4.5.2.1.1 suggests two stations/transects (within the export cable corridor (EC_03	No	The habitat reports have been included as **ES Appendix 8.3 DEP Benthic Habitat Report** (document reference 6.3.8.3) and **ES Appendix 8.4 SEP Benthic Habitat Report** (document reference 6.3.8.4), which includes the stony reef assessment in Appendix B.5. The Measures of 'Reefiness' for stony reef habitat used in

	and EC-24) showed areas of low resemblance to stony reef. However as neither of these two stations were defined as Annex 1, stony reef, the biotope is not mapped or taken further for assessment within this chapter. Further, these two stations are situated within the Cromer Shoal Chalk Beds (CSCB) MCZ.		**Appendix 8.3** and **Appendix 8.4** are taken from Irving (2009) and Golding (2020). The stony reef assessment in **Appendix 8.3** and **Appendix 8.4** determined that stations EC_03 and EC_24 did not constitute areas of Annex I habitat. Further information has been included in **Section 8.5.4.4** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8) in relation to stony reef.
Natural England	Section 10.5.4.4 No further detail is provided in the Benthic Report Appendix 10.1 and 10.2 for the criteria/methodology for assigning bedrock (chalk) and stony reef (reference is given to the habitat reports which were not included as an Appendix to this chapter) and as stated in this paragraph, there is no defined criteria for chalk reef habitat	No	
Natural England	Section 10.5.4.4 Please provide distance from shore, to characterise the location of EC-03 and EC-24 and to clarify this location is within the MCZ, but outside the 1km intertidal area where cables are proposed to be installed using HDD. No symbology is assigned in the figures to denote the low reef habitat at these stations. Appendix 10.1 and 10.2 appendices summarises	No	Distances to shore have been provided in **Section 8.5.4.4**. The stony reef assessment in **ES Appendix 8.3 DEP Benthic Habitat Report** (document reference 6.3.8.3) and **Appendix 8.4 SEP Benthic Habitat Report** (document reference 6.3.8.4) determined station EC_03 and EC_24 did not

	these two stations as coarse sediment and mixed sediment, respectively. Therefore, although mentioned here, potential stony reef habitat is not taken forward within this chapter for assessment of significance of impact. The focus remains on the area of geogenic chalk reef associated with the findings at EC-26.		constitute areas of Annex I habitat. Further information on the stony reef assessment is included in **Section 8.5.4.4**. Both sections found within **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	Assessment: The significance of the presence of Sabellaria reef habitat within the development area is not appropriately considered, with respect to its protected status as a UKBAP priority habitat under Section 40 and 41 of the NERC Act, 2006. Chapter 10 paragraphs 104 to 106 consider geogenic (bedrock and stony) reef. While outcropping chalk at Transect EC-26 is taken forward for consideration within this chapter, the low resemblance stony reef / coarse sediment observed along Transect EC-03 and EC-24 is not	No	<u>S. spinulosa reef</u> No Annex I / UK BAP priority habitat *S. spinulosa* reef habitat was identified within the SEP and DEP sites during the SEP and DEP benthic characterisation surveys. Where *S. spinulosa* was found it was at low densities (<1%) therefore it did not warrant a full assessment, as these densities fall under 'Not a reef' category. JNCC guidelines for determining *S. spinulosa* reef (Gubbay, 2007) and UK BAP priority habitat description (Maddock, 2008) were both used when analysing *S. spinulosa* for reef potential. The crusts were also considered
Natural England	Section 10.5.4.1 A5.6 Bullet point. Although the A5.6 Sublittoral biogenic reef was not classified as Annex 1 habitat, the presence of Sabellaria suggests the suitability for this habitat to occur within the export cable	No	

	corridor. Sabellaria spinulosa reef of all quality is protected under Section 40 and 41 of the Natural Environmental and Rural Communities (NERC) Act 2006.		ephemeral. Further information has been provided in **Section 8.5.4.4** and **Table 8-15** has been updated.
Natural England	Section 10.6.2.1.2 Construction Impact 1: Consideration to the A5.611 Sabellaria spinulosa on stable circalittoral mixed sediment habitat should be given. Although not classified as Annex 1, regardless of quality, Sabellaria sp. reef is a UKBAP priority habitat, protected under Section 40 and 41 of the NERC, 2006 Act. This habitat will require consideration for micro-siting during construction to avoid, mitigate and reduce any damage or loss to any emergent reef	No	Although the biotope A5.611 *Sabellaria spinulosa* on stable circalittoral mixed sediment was assigned, this was based on best fit to the faunal assemblage and sediment type rather than any reef characteristics (Fugro pers comms., 2021). Further information on the analysis of *S. spinulosa* and the assignment of the A5.611 biotope is available in **ES Appendix 8.3 DEP Benthic Habitat Report** (document reference 6.3.8.3) and **ES Appendix 8.4 SEP Benthic Habitat Report** (document reference 6.3.8.4)**.** The Applicant has committed to avoiding Annex I / UK BAP priority habitat *S. spinulosa* reef (**Table 8-4**) where required, as
Natural England	Section 10.5.4.4 Table 10-15 Designation / status column- Sabellaria spinulosa reef is a UKBAP habitat protected under Section 40 and 41 of the Natural Environmental and Rural Communities (NERC) Act 2006.	No	

			informed by pre-construction survey. <u>Stony reef</u> The stony reef assessment in **Appendix 8.3** and **Appendix 8.4** determined station EC_03 and EC_24 did not constitute as areas of Annex I habitat. Further information has been included in **Section** in relation to stony reef. Tables and sections found within **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	Section 10.5.4 The co-location of Sublittoral biogenic reef A5.6(11) with A5.431 along the export cable corridor should also be described within this paragraph.	No	Biotope A5.6 has not been included in **Section 8.5.4.1** as this biotope was not identified in the DEP characterisation report (**ES Appendix 8.1 DEP Benthic Characterisation Report** (document reference 6.3.8.1)). Therefore, no change has been made to **Section 8.5.4.1.** Further analysis of the export cable corridor during the SEP analysis allowed for further refinement of the EUNIS classification

			resulting in the co-location of the sublittoral biogenic reef A5.611 with A5.431. Biotopes were identified using the multivariate analysis of the infaunal dataset, in conjunction with the physical and biological characteristics of each multivariate group. However, as the DEP multivariate analysis (**ES Appendix 8.3 DEP Benthic Habitat Report** (document reference 6.3.8.3)) included different stations to the SEP multivariate analysis (**ES Appendix 8.4 SEP Benthic Habitat Report** (document reference 6.3.8.4)), the biotopes identified using the multivariate analysis are different. Further information has been provided in **Section 8.5.3** and **Section 8.5.4**. In relation to the co-location of A5.611 with A5.431, this has been included in the list

			of biotopes identified in the SEP site (**Section 8.5.4.2**) Sections can be found within sections found within **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	Section 10.6.2.1 Summarise the detail of habitat A4.231 (Piddocks with a sparse associated fauna in sublittoral very soft chalk or clay), including its location and spatial extent to explain overall conclusion of the impact of significance. Given the nationally protected significance for Sabellaria reef habitat, the overall evaluation of significance may require re-assessment for the WCS.	No	Further information has been provided in the impact significance summary for construction impact 1 temporary habitat loss/physical disturbance (**Section 8.6.2.1.2**, **Section 8.6.2.1.3** and **Section 8.6.2.1.4**). The Applicant has committed to avoiding Annex 1 / UK BAP priority habitat *S. spinulosa* reef and UK BAP priority habitat 'peat and clay exposures with piddocks' (**Table 8-4**) where required, therefore no temporary habitat loss/physical disturbance to these habitats is expected. Tables and sections found within sections found within **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).

Natural England	CEA: Natural England doesn't support 5km as an acceptable distance for benthic CEA.	No	A radius of 10km around the SEP and DEP project boundary has been used to identify the plans, projects and activities to be included in the CIA (**Section 8.7.2** of **ES Chapter 8 Benthic Ecology** (document reference 6.1.8). A radius of 10km also follows the approach used in the **Stage 1 CSCB MCZA Report** (document reference 5.6) and the **Report to Inform Appropriate Assessment (RIAA)** (document reference 5.4) areas of search for the associated screening exercises.
Natural England	Section 10.7.3.2 Cumulative Impact 2: long term habitat loss. How is the Applicant assured the cumulative effect of SEP and DEP will not be above the threshold for which the conservation objectives of the CSCB MCZ will be hindered? Natural England disagree with the conclusion that cumulative habitat loss is 'minor adverse' with consideration of the conservation objectives of the Cromer Shoal MCZ.	No	For information on the conservation objectives of the CSCB MCZ see the **Stage 1 CSCB MCZA Report** (document reference 5.6).

MMO	The Applicant has concluded that there is no potential for cumulative impacts relating to invasive non-native species (INNS) because biosecurity measures will be used to prevent their introduction (Table 20-21). While the MMO agree with this conclusion, it is important to note that cumulative impacts may occur due to the installed marine infrastructure acting as 'stepping stones' for the spread of INNS that are either currently in the region or may be introduced in the future. The MMO note that this possible 'stepping stone' effect has been acknowledged by the Applicant when considering the potential impacts of the proposed development alone (Section 10.6.3.7), but the MMO suggest this process is likely to be most relevant when considering the interconnectedness of the proposed development with other artificial marine structures in the region. Benthic invertebrate larvae can disperse over distances of tens to over a hundred kilometres (Álvarez-Noriega,2020),which is therefore the scale at which potential	No	Noted. The potential impact of INNS has been considered in the CIA in **Section 8.7** of **ES Chapter 8 Benthic Ecology** (document reference 6.1.8) in relation to the potential for SEP and DEP sea bed infrastructure to act as a stepping stone for INNS during the operational phase. Construction phase impacts from INNS have been screened out of the CIA.

	cumulative impacts relating to the spread of INNS should be considered.		
MMO	Transboundary impacts are addressed in Section 10.8. Such impacts are screened out for benthic ecology receptors because of their localised nature. MMO largely agree with this conclusion but as noted above in paragraph 7.10 there is a potential for the spread of INNS by using marine infrastructure as stepping stones, giving the potential for this to occur over a much broader spatial scale than the other pressures associated with the proposed development. The MMO recommend that this possibility should be considered when determining whether there is potential for transboundary impacts in Section 10.8.	No	The 'stepping stone' potential for INNS during the operational phase of SEP and DEP has been considered in transboundary impacts in **Section 8.8** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	Section 10.3.2.1 | Table 10-2 Decommissioning: We question the Applicant's outline plan to decommission scour protection, crossing and cable protection outside the Cromer Shoal Chalk Beds MCZ and possibly offshore cables *in situ*. Decommissioning should aim to remove surface laid infrastructure to avoid irreversible (permanent) habitat loss, thus returning the sea bed habitat to	No	A Decommissioning Programme will be produced at the pre-construction stage with an anticipated commitment to decommission *in situ* any buried scour protection and cables, as removing them is generally accepted to be likely to cause more disturbance. However, the Decommissioning Programme

	its pre-developed baseline status. We recognise there is merit in decommissioning buried infrastructure such as cables *in situ* to avoid further habitat disturbance; however in highly dynamic environments, such as the Southern North Sea, it is possible that cables may become free spanning in the future and require removal, or if left in -situ require further protection resulting in disturbance and loss of habitat. Natural England advices that cable protection options that have the most likelihood of being removed should be taken forward within Cromer Shoal MCZ. Natural England welcome that a decommissioning plan will be produced.		would ensure there is reasonable flexibility in the options available, with the final decision being based on the available information and guidance at the time of decommissioning. However, for the purposes of the assessment, decommissioning through removal of buried infrastructure is likely to be the worst case scenario. Impacts of removal of infrastructure are considered to be comparable to construction phase impacts. The Applicant has committed to removing external cable protection within the MCZ (see **Table 8-4** of **ES Chapter 8 Benthic Ecology** (document reference 6.1.8) and the **Outline CSCB MCZ CSIMP** (document reference 9.7).
Natural England	Section 10.6.4 Decommissioning. Natural England consider scour and cable protection should be removed during decommissioning if above the sea bed thus avoiding permanent habitat loss. While it is recognised that decommissioning buried infrastructure '*in situ'* such as cables avoids further temporary impacts, it is possible that in	No	

	the future cables may free span from the surface and require further protection. This likelihood in areas of mobile sandy sediment should be considered decommissioning plan.		
TWT	Although TWT appreciate that decommissioning is subject to a separate planning application, we would like to see a commitment within the DCO from Equinor to decommission as much infrastructure as possible to ensure the recovery of the marine environment. A huge amount of infrastructure at sea is expected over the next 30 years to meet net zero, and therefore every effort should be made to decommission infrastructure in order to make 'head room' for this scale of development. It is a requirement under the Energy Act, UNCLOS and OSPAR to decommission offshore infrastructure.	No	
Natural England	Section 10.6.3.2 Impact 2: Permanent Habitat Loss. Natural England consider there are opportunities to reduce the permanent loss of habitat to long term, through commitment to remove surface infrastructure such as for cable protection.	No	

Natural England	Section 10.3.3.1 Foundations -Please expand to include details of the embedded mitigation for micro-siting.	No	Micro-siting will be used where possible to minimise the requirements for sea bed preparation prior to foundation installation. Further information on micro-siting has been provided in **Table 8-4** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	Section 10.3.3.2 Natural England welcomes the additional mitigation measures within the CSCB MCZ, namely the commitment to minimise external cable protection. Can it be explained here how this certainty can be achieved?	No	The **Outline CSCB MCZ CSIMP** (document reference 9.7) and the Interim Cable Burial Study (**Appendix 9.7.1** of the **Outline CSCB MCZ CSIMP** (document reference 9.7.1)) provides further detail on these matters.
Natural England	Section 10.6.2.1.2 Impact 1 - Given the high sensitivity of the Habitat A4.231 and the fact that it is a UKBAP priority habitat, Natural England suggest that the Applicant details how there will be no direct impacts from construction - due to its location within the array and/or micro-siting and thus avoiding around this habitat for any construction and O&M works.	No	Habitat A4.231 'piddocks with a sparse associated fauna in sublittoral very soft chalk or clay' has only been confirmed at one location in the southwest corner of the SEP site. Pre-construction surveys will be undertaken to identify any potential Annex I / UK BAP priority habitat *S. spinulosa* reefs or UK BAP priority habitat 'peat and clay
Natural England	Section 10.6.2.2.2	No	

	Impact 2: As above, clarification of certainty, of avoiding the biotope A4.231 Piddocks with a sparse associated fauna in sublittoral very soft chalk or clay within a plan should be stated here rather than 'likely' as stated in this paragraph		exposures with piddocks' which, if required, will be micro-sited around during detailed design. This commitment has been included in **Table 8-4** of **ES Chapter 8 Benthic Ecology** (document reference 6.1.8).
Natural England	Section 10.6.2.5.1 Natural England welcome the proposed measures to minimise the introduction of Invasive Non-Native Species.	No	Noted.
Natural England	Section 10.6.3.3.1 Impact 3: Long term Habitat Loss. Natural England welcomes the commitment to the use of removable rock bags as cable protection, thus minimising permanent habitat loss within the MCZ. However, every effort should be made to minimise cable protection within the MCZ.	No	Noted. The commitment to reduce the use of external cable protection as much as possible and to use removable external protection systems within the MCZ is included in **Table 8-4** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8). Also see the **Outline CSCB MCZ CSIMP** (Document reference 9.7).
MMO	The MMO note that additional mitigation measures have been summarised in Tables 10-3 and 10-4. It is stated that the cable corridor will be routed to avoid as many known sensitive benthic habitats as	No	Pre-construction surveys will be undertaken to identify any benthic habitats of particular importance (including Annex I habitats). Consultation with the

	possible and that turbine foundations will be micro-sited to minimise the requirements for sea bed preparation prior to foundation installation (Table 10-3). However, it is unclear whether pre-construction surveys will be used to inform the positioning of infrastructure and avoid sensitive benthic features (e.g., Sabellaria reef). The MMO would like to see further information from the Applicant to provide clarification on their plans relating to pre-construction surveys and micro-siting. The MMO would expect sensitive benthic features to be avoided wherever possible and for monitoring to be carried out if any infrastructure is installed within the vicinity of sensitive benthic features.		MMO and Natural England on the results of the pre-construction surveys will be undertaken and a strategy for avoidance of any identified features will be agreed at that time. Further information has been provided in **Table 8-4** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8). Also see the **Outline CSCB MCZ CSIMP** and its **Appendix 9.7.1 Interim Cable Burial Study (ICBS)** (document reference 9.7.1) for more information regarding cable installation through the MCZ. Anticipated benthic monitoring requirements are described in the **Offshore IPMP** (document reference 9.5).
MMO	The MMO note that the Applicant has considered offsetting some potential impacts by creating an artificial reef with juvenile lobsters outside the MCZ. Should this approach be taken, the Applicant will	No	The Applicant has removed this option from **Appendix 1 In-Principle Measures of Equivalent Environmental Benefit (MEEB) Plan** (document

	need to provide detailed plans of how this will be constructed.		reference 5.7.1) of the **Marine and Coastal Access Act (MCAA) Derogation: Provision of Evidence** (document reference 5.7) following feedback from stakeholders.
TWT	Could Equinor commit to micro-siting around areas of soft chalk or clay to avoid impacts?	No	There was only one area of potential soft clay recorded (EC_26) however this is inshore of the HDD exit point and would therefore not require micro-siting. The **Stage 1 CSCB MCZA** (document reference 5.6) describes that, within the offshore export cable route, in areas of mobile sand, there is potential for temporary exposure and reburial of underlying geological units, including chalk, however due to their transient nature, micro-siting is unlikely to be appropriate in these cases. However, as set out in the **Outline CSCB MCZ CSIMP** (document reference 9.7), micro-

			siting will be used within the offshore export cable corridor to avoid areas that are likely to be challenging to cable burial. See above and **Table 8-4** in **ES Chapter 8 Benthic Ecology** (document reference 6.1.8) regarding mitigation to avoid UK BAP priority habitat 'peat and clay exposures with piddocks'**.**
Natural England	Section 10.3.3.1 Cables – Natural England welcomes the intention to bury cables where possible, thereby minimising the requirement for cable protection. We would also welcome options for a joint cable system which would reduce the impacts.	No	Noted. The **Outline CSCB MCZ CSIMP** (document reference 9.7) and its **Appendix 9.7.1 Interim Cable Burial Study** (document reference 9.7.1) provides further detail on offshore export cable installation within the MCZ. Post-consent the number of Offshore Substation Platforms (OSPs) and offshore export cables (and the nature of their design) will be decided during detailed design considerations. Detail on the requirement for flexibility in design and

			construction scenarios is provided in the **Scenarios Statement** (document reference 9.28).
Natural England	Section 10.6.2.1.2 Natural England welcomes the intention to commit to avoiding the creation of persistent trenches particularly in coarse areas, thus reducing the recovery time for habitats disturbed during construction. Further explanation on the technique or plan to ensure this, should be provided or cross referenced here.	No	Noted. The **Outline CSCB MCZ CSIMP** (document reference 9.7) and its **Appendix 9.7.1 Interim Cable Burial Study** (document reference 9.7.1) provides further detail on offshore export cable installation within the MCZ.

7 Fish and Shellfish Ecology

Consultee	Comment	Development change?	Response
MMO	8.1 The PEIR appears to have considered all the relevant finfish biota receptors, with a few key species taken forward for consideration and other species reviewed in more depth within the technical reports. Appropriate impacts have been identified. As previously advised for the scoping opinion certain impacts have been appropriately scoped out, particularly where they are not relevant for the development stage applicable/relevant to	No	Noted.

	that stage of the development. This was an acceptable approach.		
MMO	8.2 MMO note that SEP and DEP could be constructed at the same time or sequentially with a maximum 4 year gap start to start and 1 year gap in offshore construction, which has potential implications for potential piling impacts upon fish receptors. The PEIR details that simultaneous piling could also be possible (one piling operation per project).	No	The offshore construction programme is described in **ES Chapter 4 Project Description** (document reference 6.1.4). Offshore construction works would require up to two years per project (excluding pre-construction activities such as surveys), assuming SEP and DEP were built at different times. If built at the same time, offshore construction could be completed in two years. Accounting for the development scenarios described in **Section 4.1.1** of **Chapter 4 Project Description** (document reference 6.1.4), there could be a gap of up to one year between the completion of offshore construction works on the first Project and the start of offshore construction works on the second Project. The noise modelling has been updated to account for potential

			simultaneous piling between SEP and DEP and **Section 9.6.2.7** in **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9) has been updated accordingly. Simultaneous piling is possible should SEP and DEP both be constructed concurrently. In this scenario, as a worst case, one piling operation could occur in the SEP wind farm site at the same time (i.e. simultaneously) as a piling operation in the DEP wind farm site (one piling operation per project).
MMO	8.3 MMO recognise and support that the Applicant has taken previous consultation comments regarding evidence sources on board when discussing the data available on the fish species present within the proposed development areas. The Applicant has also utilised the following data sources: spawning and nursery grounds identified in Coull *et al*., (1998) and Ellis *et al*., (2012), ICES International Herring Larval Survey (IHLS), Sheringham shoal elasmobranch surveys (pre and post cable installation), Project benthic characterisation survey. MMO support the inclusion of these sources of evidence in the PEIR assessment.	No	Noted.

	8.4 MMO note that the Applicant has included data from the pre- and post-construction surveys for fish and elasmobranchs for Dudgeon and Sheringham Shoal operational windfarms, including their associated limitations in both Chapter 11 and the associated technical report, which is suitable.		
MMO	8.5 The Applicant has identified mitigation measures in respect to fish biota in Table 11-3. MMO note that any requirement for UXO removal will require a separate Marine licence application. The final requirement for mitigation measures should be informed by the outcomes of the EIA. MMO support the current mitigation measures proposed.	No	Noted. As agreed at the marine mammals ETG meeting on the 20th July 2020, UXO clearance requirements will be addressed through a separate Marine Licence application post consent. An assessment has been provided within **Section 9.6.1** in **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9) for information purposes only.
MMO	8.6 The MMO broadly support the cumulative and inter-related descriptions which will be discussed in further detail in the EIA.	No	Noted. Cumulative impacts are assessed in **Section 9.7** and Inter-relationships in **Section 9.9** within **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9).
MMO	8.7 The distribution of fish species included in the assessment are independent of national geographical boundaries. The assessment for DEP and SEP has been	No	Noted

	undertaken, taking into account the distribution of fish stocks and populations, irrespective of national jurisdictions. The assessment has demonstrated that the spatial extent of impacts from the construction, operation and decommissioning of DEP and SEP do not stretch beyond UK waters. As such, no transboundary impacts are anticipated with respect to fish ecology. MMO support this conclusion.		
MMO	With regard to Paragraph 379 – It is stated that *'elasmobranchs typically having wide distribution range and defined nursery grounds. Literature on elasmobranch spawning is limited and elasmobranch abundance is overall low within the area of the SEP and DEP sites'.* While the MMO generally agree that there is limited information on elasmobranch abundance in the vicinity of SEP and DEP, there are some data sources available that may help elucidate this. Bird *et al*. (2020) reviewed fifty years of skate mark-recapture tagging data and show there to be skate movements in ICES division Area 4.c and in the vicinity of SEP and DEP. Further information can be found in the Thornback Ray Cefas Fisheries Science Partnership Report.	No	Additional information in reference to Bird *et al.* (2020) and McCully *et al.* (2013) has been added to **Section 9.5.1** and **9.6.2.8.2** in **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9).
MMO	The MMO note that the study area for the desk-based finfish assessment is generally focused to International Council for the Exploration of the Seas (ICES) statistical rectangles scale of 34F1 and 35F1 (local) and 34F0 and 35F0 (regional), which is appropriate. MMO landings data are discussed for both study areas, though International Bottom Trawl Survey (IBTS) is mainly considered only for	No	Noted. **Section 9.5.2.2.2** in **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9) provides detail of IBTS surveys for the regional study area (as

	the local area. While the MMO consider this to be satisfactory for most of the impacts assessed, the potential impact ranges associated with piling, in particular Temporary Threshold Shift (TTS) seems to overlap into the regional study area. As IBTS data have been included from both quarter 1 and quarter 3 surveys and standardised catch per unit effort (CPUE) plots are presented in the technical report for key species (e.g., herring Figure 11.5), it would be useful to include IBTS from the regional study area in Chapter 11 to improve the robustness of the assessment. This is particularly of interest for potential piling impacts upon herring and sandeel.		defined by ICES rectangles 34F0 and 35F0). **ES Appendix 9.1 Fish and Shellfish Ecology Baseline Technical Report** (document reference 6.3.9.1) has also been updated to reflect the findings of the surveys in this area noting that there are no IBTS data available for 34F0.
MMO	There is potential for concurrent piling to take place at SEP and DEP. The Applicant has identified that the noise exposure contours for the monopile worst-case maximum hammer energy scenario (5,500 kilojoules 'kJ') for the two sites do not overlap for mortal injury or injury but do for TTS (Chapter 11, point 261). However, it is not clear to the MMO if the Applicant has modelled a concurrent piling scenario or just considered the overlap of the SEP and DEP separate modelled impact ranges for TTS, mortal injury etc.	No	Additional modelling has been carried out to investigate the potential impacts of two pile installations occurring simultaneously at separated foundation locations. This is described in **Section 9.6.1.4** (and in more detail in **Section 5.3** of **ES Appendix 10.2 Underwater Noise Modelling Report** (document reference 6.3.10.2)). Using the worst case monopile and pin pile scenarios (**Table 9-2**), modelling has been carried out for simultaneous piling at both the SEP E and the

			DEP SE modelling locations, representing the worst-case locations of each site. The modelling assumed that the two piling operations start at the same time. **Section 9.6.1.4** has been updated to consider a simultaneous piling scenario. Section and Tables mentioned above can be found in **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9).
MMO	It does not appear to the MMO that specific behavioural contours have been modelled for piling impacts, though note that the Applicant has acknowledged that behavioural impacts may extend beyond the TTS impact ranges. At present the MMO do not consider that this has not been fully assessed and express potential concerns for Banks gravid adult herring which are likely to exhibit behavioural responses to noise and vibration from piling. The TTS contours presented in Figure 11.6 show that they extend towards the southern extent of the Flamborough Head herring spawning ground (towards IHLS data area) and it is not clear if behavioural impacts from piling may impact herring on this spawning ground.	No	Behavioural response impact ranges based on observed levels from Hawkins *et al.* (2014) have been used to inform the single piling scenarios (**Table 9-22** in **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9)). Further detail and results are provided in **Appendix 10.2** (document reference 6.3.10.2). Whilst the authors note that the results of the study cannot yet be used to

MMO	MMO would have expected the Applicant to also model behavioural impacts from the percussive piling. TTS and behaviour are neither the same nor assessed using the same noise exposure criteria: the biological basis for TTS can involve reversible damage to the ear whereas behavioural effects can cause avoidance. Please see below for further comments.	No	define sound exposure criteria for use in EIA, in the absence of reliable numerical criteria for behavioural disturbance in fish, it is considered that the values provide a useful metric to inform the assessment. It should be noted that the study was conducted under conditions in quiet inland waters which are unlikely to be equivalent to those around the SEP and DEP sites.
MMO	The MMO have concerns relating to behavioural responses in herring from piling: 8.13.1 Spawning – It is not known exactly how herring will react to the noise on reaching the spawning grounds, so it cannot be concluded with confidence that there will not be any impact. If herring were to exhibit avoidance/fleeing behaviour, then they may be unable to reach their spawning grounds potentially resulting in spawning failure that year. 8.13.2 Migration - Herring migrate through the North Sea in a north-south direction with spawning occurring during this time at suitable spawning grounds. Accordingly, the timing of spawning occurs earlier in the season in the northern spawning grounds and occurs later in the season as the stock migrates south.	No	**Section 9.6.1.4** of **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9) provides an assessment of potential underwater noise impacts which has been updated for the ES and includes consideration of potential impacts on herring spawning.

MMO	8.14 The MMO note that concerns of TTS relate less so to eggs and larvae given their immobility and/or reduced motility.	No	Noted.
MMO	8.15 The MMO would like to request further information is provided for additional noise modelling depicting the behavioural noise contours based on monopiling for a stationary receptor. Noise modelling should be presented for the received levels of single strike sound exposure levels (SELss) at the herring spawning grounds based on 135 decibels (dB) in order to determine the likely range in which behavioural responses in herring could occur.	No	A stationary receptor has been assumed for all relevant (i.e. SEL_{cum}) underwater noise modelling criteria and assessments in **Table 9-22**. SELss impact ranges (to which neither a fleeing or stationary animal model apply since this measures a single noise event) based on 135dB are presented in **Table 9-22** and indicate that behavioural responses could occur at a maximum range of up to 39km. As requested, impact contours are shown on **Figure 9.8** for a 135dB SELss scenario at the SEP North and DEP North modelling locations (i.e. those closest to the herring spawning ground to the north west) in relation to potential herring spawning grounds. Contours for the 1st strike and maximum

			hammer energies are presented. The impact contours do not extend into the IHLS survey areas to the north east where herring spawning activity is presumed to be concentrated. Tables and sections mentioned above can be found in **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9).
MMO	8.16 The Applicant has outlined mitigation to reduce the impact of Electromagnetic Fields (EMF) on elasmobranchs by burying the cable to between 0.5 – 1.5 m (Point 22). The ideal depth to reduce the impact to is 1.5 m, but this may not be possible in all areas depending on ground conditions. The MMO note that the burial risk assessment was a draft and that once further geotechnical and geological investigations have been undertaken that further information on burial depth techniques and options will be presented.	No	The Applicant will make reasonable endeavours to bury offshore cables, reducing the effects of EMF and also reducing the need for surface cable protection which reduces the introduction of hard substrate and modification of habitat. The **Outline CSCB MCZ CSIMP** (document reference 9.7) and its appendices provide further detail on the anticipated cable installation and protection requirements within the CSCB MCZ. Post consent, a CSIMP covering the full extent of the

			SEP and DEP offshore sites will be produced and will provide detailed cable laying plans and burial specifications.
MMO	8.17 With regard to potential impacts to elasmobranchs from EMF, there is limited information and great uncertainty on impacts to marine fauna and their life stages, consequently significant uncertainties concerning electromagnetic effects remain (Gill and Desender, 2020). The MMO would like to highlight a recent study by Hutchison et al., (2020), which found multiple statistically significant differences in the behavioural parameters of little skate (*Leucoraja erinacea*) and American lobster (*Homarus americanus*) when exposed to EMF from sub-sea cables with a target burial depth of 1.2–1.8 m.	No	The assessment of potential impacts from EMF has been updated (**Section 9.6.2.8** in **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9)). The Hutchison et al. (2020) study examined HVDC cables which tend to emit higher strength EMF than HVAC cables that will be installed at SEP and DEP. However, that study, together with Hutchison *et al.* (2018), Gill and Dessender (2020) and other recent studies have been used to bolster the EMF assessment.
Natural England	Summary of Main Points 4) Impacts on the Natural Environment Fish and Shellfish	No	Permanent habitat loss and long term habitat loss are considered as separate impacts in **Sections 9.6.2.2** and **9.6.2.3** respectively (both sections within in **ES Chapter 9 Fish and Shellfish**

	Natural England have focused on the impacts to herring and sandeel, in particular spawning grounds. Sandeel and herring are both important prey species for fish, birds and marine mammals. We have concerns that the PIER does not take into consideration that scour and rock protection will result in permanent habitat change and will reduce the available spawning grounds for these species. We are particularly concerned about the DEPN area as this is key spawning habitat for sandeels.		**Ecology** (document reference 6.1.9)). Consideration of the potential loss of habitat suitable for herring and sandeel spawning is provided in these sections. See below for responses to Natural England's specific comments on these matters.
Natural England	Chapter 11 Fish Ecology Detailed Comments Subject: 11.5.2.3 Comment: Gravel and sandy gravel are preferred spawning habitats for herring. “Areas identified as ‘Preferred’ herring spawning habitat comprise approximately 21% of the DEP wind farm sites and 10% of the SEP wind farm site.” Given that sandeel are an important prey species for fish, birds and marine mammals, we have concerns that work within the windfarm sites will result in temporary habitat loss/disturbance from construction activities, and permanent habitat loss/change through the ongoing presence of turbines and rock protection. Recommendation:	No	Permanent change in habitat is scoped in and assessed in **Section 9.6.2.2** in **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9). As described in **ES Chapter 4 Project Description** (document reference 6.1.4), scour protection would only be used in areas subject to scour and therefore scour protection would be minimised throughout the SEP and DEP sites. The installation of external cable protection would be required where cables cannot be buried

	Scope in the permanent change in habitat from rock protection. We would welcome further information and/or discussions around minimising the use of cable protection and scour prevention in habitat suitable for herring spawning. Consider seasonal restrictions to avoid construction activities in habitat suitable for herring spawning during peak herring spawning (Aug-Oct).		due to ground conditions or where minimal burial depths cannot be achieved. Within the MCZ the Applicant has committed to remove any external cable protection installed. A realistic worst case of up to 1,800m^2 of external cable protection within the MCZ for the duration of SEP and DEP is assessed in **Section 9.6.2.3**. The **Outline CSCB MCZ CSIMP** (document reference 9.7) describes the experience of the Dudgeon Offshore Wind Farm (DOW) export cable installation which did not require any external cable protection. As described in the **Outline CSCB MCZ CSIMP**, the SEP and DEP export cable route runs parallel to the DOW export cables in an area of similar sea bed sediments and therefore the likelihood of needing external cable protection at SEP and DEP is relatively low.

Natural England	Chapter 11 Fish Ecology Detailed Comments Subject: 11.5.2.3 Comment: Sand and gravelly sand is preferred spawning habitat for sandeel. The majority of sediment samples from the DEP wind farm sites are assessed as 'Preferred' sandeel habitat. "Areas identified as sandeel Preferred habitat comprise approximately 61% of the DEP wind farm sites and less than 4% of the SEP wind farm site." Given that sandeel are an important prey species for fish, birds and marine mammals, we have concerns that work in the DEP windfarm site will result in temporary habitat loss/disturbance from construction activities, and permanent habitat change/loss through rock protection. We are particularly concerned about Dudgeon North area as this is key spawning habitat. Recommendation: Scope in the permanent habitat loss from rock protection. We would welcome further information and/or discussions around minimising the use of cable protection and scour prevention in habitat suitable for sandeel spawning. Consider seasonal restrictions to avoid construction activities in habitat suitable for sandeel spawning during peak sandeel spawning (Nov-Feb). In addition, we would welcome the assessment of impacts	No	Permanent change in habitat is scoped in and assessed in **Section 9.6.2.2**. Further detail on sandeel has been added to the assessment. An impact of minor adverse significance is predicted and therefore the Applicant does not consider that seasonal restrictions on construction activities are necessary. **Table 4-1** of **ES Chapter 4 Project Description** (document reference 6.1.4) identifies the development scenarios and how they relate to the grid options. The Applicant agrees that the development/build out scenarios have implications for the scale of impacts and for this reason has carefully considered and assessed each option (see **Table 9-2**). This ensures that the worst-case scenario is addressed and allows mitigation to be specific to each scenario. It should be noted that the focus is

	due to DEPN, DEPS, SEP and SEP & DEP combined, set out in tabular format		on identifying and assessing the worst-case scenario (in line with the PINS s51 advice on this matter dated 21 May 2021). In this manner, differences are assessed by exception. The fish ecology assessment details how each scenario has been considered and, where appropriate, e.g. in consideration of suitable herring spawning and sandeel habitat, the differing sensitivities of each of the wind farm sites have been considered within the impact assessment. In addition, the **Offshore In Principle Monitoring Plan (IPMP)** (document reference 9.5) includes provision for monitoring of potential changes in sandeel habitat suitability. Unattributed tables and sections can be found in **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9).

Natural England	Chapter 11 Fish Ecology Detailed Comments Subject: 11.3 Table 11-2 Comment: Natural England note that no final decision has been made regarding the final decommissions policy for the offshore project infrastructure. The Applicant has stated that scour protection is likely to be decommissioned in situ. Previous discussions with other OWF project engineers have highlighted that it is considered almost impossible to recover rock armouring at the time of decommissioning. Therefore, consideration should be given to identifying those options for scour prevention and cable protection which would enable decommissioning in areas which impact on prey availability to designated sites features. Recommendation: Natural England would welcome consultation on the decommissioning plan and confirmation about removal of scour/rock protection in areas considered to be of importance to Sandeel and Herring spawning habitat.	No	As noted by Natural England, it is difficult to remove rock-dump scour and cable protection at decommissioning although this can be achieved by using a suction dredger but not without disturbing the underlying sediments. Natural England will be consulted on the Decommissioning Programme at the pre-construction phase. Given the sensitivities associated with the CSCB MCZ, the Applicant has committed to using removeable external cable protection systems within the MCZ. No scour protection will be installed within the MCZ. As described in **ES Chapter 4 Project Description** (document reference 6.1.4)**,** scour protection would only be used in areas subject to scour and therefore scour protection would be minimised throughout the SEP and DEP wind farm sites.

			See above regarding cable burial depth and cable protection within the MCZ. In addition, the **Outline CSCB MCZ CSIMP** (document reference 9.7) provides further information on cable installation and protection within the MCZ. The Applicant notes the recent Natural England commissioned report (Peritus International Limited, 2022) on scour and cable protection decommissioning which has informed production of the **Outline CSCB MCZ CSIMP** and its **Appendix 9.7.3 Cable Protection Decommissioning Feasibility Study** (document reference 9.7.3).
Natural England	Chapter 11 Fish Ecology Detailed Comments Subject: 14.6.2.5 Comment: We agree that “Long-term changes to benthic habitat due to rock protection and other infrastructure at specific locations within the wind farm sites and offshore cable	No	Potential impacts on herring and sandeel spawning and nursery grounds are assessed in **Section 9.6.2.2** and **9.6.2.3** in **ES chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9). The referenced text in **ES**

	corridors may affect spawning and nursery grounds, most notably for demersal spawners." Natural England queries why the issue of impacts on spawning herring and sandeel are then not discussed further. Recommendation: Please see our comments above.		**Chapter 12 Commercial Fisheries** (document reference 6.1.12) has been updated to reflect that the assessment of potential permanent habitat loss impacts has been undertaken for demersal spawning species within **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9).
Natural England	Chapter 11 Fish Ecology Appendix Subject: 11.1.2.4.1 Comment: Data from otter trawl surveys in 2005 and 2008 showed that herring was the most abundant species caught. We have concerns over the relevance of this data 13-16 years later. Recommendation: NE would welcome more up to date data	No	Comment noted, however no site specific fish surveys are proposed at this time. At the Sea bed ETG on 30/10/2019 it was agreed that *"New fish characterisation surveys are not necessary as the sources of data proposed to inform the desk-based assessment will be adequate"*. The Applicant is not aware of any more recent fish survey data covering the wind farm sites.
Natural England	Chapter 11 Fish Ecology Detailed Comments Subject: 11.1.1 Comment:	No	Comment noted however no site specific fish surveys are proposed at this time. At the Sea bed ETG on 30/10/2019 it was agreed that *"New fish characterisation surveys are not*

	Similar to the above, there was a pre-construction survey in 2009 and a post-construction herring spawning survey in 2010. We have concerns over the relevance of this data 11-12 years later. Recommendation: NE would welcome more up to date data		*necessary as the sources of data proposed to inform the desk-based assessment will be adequate".* The Applicant is not aware of any more recent herring spawning survey data covering the wind farm sites.
EIFCA	"Within the project there are aspects which may have an impact on the ability of diadromous fish to undertake their normal migratory movements (such as EMF effects on species with an ability to detect these). We defer to the advice and comments of the relevant authority, who we understand to be the Environment Agency in connection with these potential impacts, with some specific comments in relation to this, as identified in the section "Specific Points".	No	Noted.
EIFCA	Issues relating to Cables & EMF We think that the issue of potential effects from cables & EMF has been dismissed rather too lightly. This is especially the case for the cable route within the MCZ, where we note that "….. there is unprotected surface lay of cable (which is proposed as an option within the Cromer Shoal MCZ). …." (Chapter 14 Commercial Fisheries, section 327). Our concerns arise from three main points – 1. The potential danger to fishers posed by the snagging risk of surface laid cables interacting with fishing gear. We do not necessarily accept that this is a risk only for mobile	No	There would be no unprotected surface laid cable within the MCZ and export cable corridor. This has been amended in **ES Chapter 12 Commercial Fisheries** (document reference 6.1.12). Cable burial requirements for the purpose of the environmental assessment have been informed through the completion of an export cable burial risk

	gear, and suggest that there needs to be full consideration of the potential impacts of snagging surface laid cables for potting gear.		assessment (Pace Geotechnics, 2020) which has been produced by the Applicant at an early stage to inform the design and environmental assessment processes on advice from relevant stakeholders. In addition, geotechnical surveys undertaken in October 2021 have further informed cable burial and protection requirements within the MCZ as detailed in the **Outline CSCB MCZ CSIMP** (document reference 9.1). The **Outline CSCB MCZ CSIMP** (document reference 9.7) provides further detail on offshore export cable installation within the MCZ including potential external cable protection requirements. The **Outline CSCB MCZ CSIMP** (document reference 9.7) describes the experience of the DOW export cable installation which did not require any

			external cable protection. As described in the CSIMP, the SEP and DEP export cable route runs parallel to the DOW export cables in an area of similar sea bed sediments and therefore the likelihood of needing external cable protection at SEP and DEP is relatively low. Potential gear snagging risk to fishing vessels is assessed in **Section 12.6.2.4** of **ES Chapter 12 Commercial Fisheries** (document reference 6.1.12). In addition, **Section 12.3.3** of **ES Chapter 12 Commercial Fisheries** (document reference 6.1.12) details mitigation measures that will be implemented to mitigate potential impacts on commercial fisheries.
EIFCA	2. The EMF effects experienced by organisms within the sea diminishes with distance from the cable source of such EMFs. This is recognised within the PEIR by the proposal of cable burial as a mitigation measure, with statements such as “The Applicant is committed to burying offshore export cables where possible, reducing the	No	The assessment of potential EMF impacts has been updated and the assumptions around EMF clarified (see **Section 9.6.2.8**).

	effects of electromagnetic fields (EMF) .. Typical burial depth for SEP and DEP cables, .. is expected to be between 0.5m to 1.5m (or up to 1m for the export cables)" (Chapter 11 –Within Table 11-3: "Embedded Mitigation Measures"). When the cable is surface laid, the EMF effects have the potential to be much greater than would be the case for buried cables. This calls into question calculations such as those in Chapter 11, Table 11-27: "Calculated maximum magnetic fields for offshore SEP and DEP export cable circuit scenarios", which indicates a maximum magnetic field (µT) at cable surface of 1653. The document then proceeds to calculate "At 0 m. distance above sea bed, max field strength = 26.54 µT". Would it not be the case that for a surface laid cable, the maximum field strength within the water column would be the same as at the cable surface, as there would be no separation distance between water column and cable surface?		As noted above, there would be no unprotected surface laid cable within the MCZ. **Table 9-27** of **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9) provides the results from the project specific EMF assessment (Tripp, 2021). All calculations were performed assuming maximum load, minimum circuit separation and assume a cable buried at 1m below the sea bed. Where loose rock dump burial occurs, there is a possibility that small fish or shellfish could be exposed to higher levels, if small enough to swim through the rocks. The magnetic field at the cable surface represents the highest possible exposures and ranged between 1217 and 1653 µT, depending on the scenario (see **Table 9-27**). However, it should be noted that the Applicant has committed to installing removable external

			cable protection systems within the MCZ and so no loose rock dump would be installed. This would prevent or limit the ability of small fish and shellfish to penetrate the cable protection within the MCZ and be subject to the highest possible exposures. The magnetic fields from all options reduced to very low levels within a few metres from the circuits and it is important to note that these levels do not take account of shielding factors of the cable sheath which would further reduce EMF.
EIFCA	3. We think that there may well be more uncertainty over effects arising from EMF than presented in the PEIR. This is especially the case for cables potentially on the sea bed or shallow buried, as identified above may be the case within the MCZ. Bearing in mind the potential effects on elasmobranchs, and the fact that it is recognised that "It should be noted that Dover sole and thornback ray nursery areas are restricted to shallower inshore waters" (Chapter 11 – Fish Ecology, section 68) there are legitimate concerns over the residual uncertainty in understanding of effects from EMF.	No	As noted above, there would be no unprotected surface laid cable within the MCZ. The **Outline CSCB MCZ CSIMP** (document reference 9.7) provides further information on cable laying and potential cable protection requirements within the MCZ.

	There are several scientific sources which raise the issues of uncertainty, or even identified effects, regarding EMF and a range of marine species. For instance – Scott, K., Harsanyi, P. and Lyndon, A.R., 2018. Understanding the effects of electromagnetic field emissions from Marine Renewable Energy Devices (MREDs) on the commercially important edible crab, Cancer pagurus (L.). Marine pollution bulletin, 131, pp.580-588. "Crabs showed a clear attraction to EMF exposed shelter (69%) compared to control shelter (9%) and significantly reduced their time spent roaming by 21%. Consequently, EMF emitted from Marine Renewable Energy Devices (MREDs) will likely affect edible crabs both behaviourally and physiologically, suggesting that the impact of EMF on crustaceans must be considered when planning MREDs." Normandeau, Exponent, T. Tricas, and A. Gill. 2011. Effects of EMFs from Undersea Power Cables on Elasmobranchs and Other Marine Species. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, Pacific OCS Region, Camarillo, CA. OCS Study BOEMRE 2011-09. "Summary of case history impact assessment. "Invertebrates: Spiny lobster / (Type of effect possible) – Navigational miscue during migration or homing / (Certainty) - Sensory threshold overlaps with predicted fields." (It would appear that this same paper is quoted in Chapter 11 – Fish Ecology, Section 388, as "Although there is no		At Dudgeon OWF, 93% of the export cable length had burial depth >1.0 m). At one location 3km to 4km from shore, subcropping chalk was encountered at about 0.3m below sea bed, resulting in a reduced burial depth in this area of 0.3m. This was accepted due to the burial depth being in solid ground conditions, which from a cable burial risk assessment perspective offers greater protection from damage from anchoring and fishing activity. No remedial cable protection (either through burial or with external protection) was performed. Post-construction surveys do not show any exposed export cables, nor visibility of the trenched route on the sea bed. To date, no cable repair or remedial reburial works have been undertaken since the wind farm has been in operation. Potential EMF impacts are assessed in **Section 9.6.2.8**

	direct evidence of effects to invertebrates from undersea cable EMF (Normandeau *et al*. 2011),…". This would seem at odds with the text identified above). Gill, A.B., Bartlett, M. and Thomsen, F., 2012. Potential interactions between diadromous fishes of UK conservation importance and the electromagnetic fields and subsea noise from marine renewable energy developments. Journal of Fish Biology, 81(2), pp.664-695. "The information on which to base the review was found to be limited with respect to all aspects of these fishes' migratory behaviour and activity, especially with regards to MRED deployment, making it difficult to establish cause and effect relationships. The main findings, however, were that diadromous species can use the Earth's magnetic field for orientation and direction finding during migrations. Juveniles of anadromous brown trout (sea trout) Salmo trutta and close relatives of S. trutta respond to both the Earth's magnetic field and artificial magnetic fields. Current knowledge suggests that EMFs from subsea cables may interact with migrating Anguilla sp. (and possibly other diadromous fishes) if their movement routes take them over the cables, particularly in shallow water (<20 m). The only known effect is a temporary change in swimming direction. Whether this will represent a biologically significant effect, for example delayed migration, cannot yet be determined. Diadromous fishes are likely to encounter EMFs from subsea cables either during the adult movement phases of life or their early life		which has been updated for the ES. Reference to Scott, Harsanyi and Lyndon (2018); Scott *et al.* (2021); and Gill, Bartlett and Thomsen (2012) has been added to **Section 9.6.2.8** and the referenced statement to section 388 has been deleted. As noted in **Section 9.6.2.8**, SEP and DEP will involve installing offshore (and onshore) export cable circuits using HVAC technology. Fish and shellfish species are less likely to exhibit responses to HVAC cables when compared to High Voltage Direct Current (HVDC) transmission cables due to the higher strength EMF emitted by HVDC cables (Normandeau, Tricas and Gill, 2011). However, reference to Hutchison *et al.* (2018) and Hutchison *et al.* (2020) have been added to **Section 9.6.2.8.**

	stages during migration within shallow, coastal waters adjacent to natal rivers..” Hutchison, Z., Sigray, P., He, H., Gill, A.B., King, J. and Gibson, C., 2018. Electromagnetic Field (EMF) impacts on elasmobranch (shark, rays, and skates) and American lobster movement and migration from direct current cables. Sterling (VA): US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM, 3, p.2018. “Homarus americanus (the American lobster) exhibited a statistically significant but subtle change in behavioral activity when exposed to the EMF of the HVDC cable, which operated at a constant power of 330 MW (1175 Amps). At the treatment enclosure (B), lobsters were on average closer to the sea bed and exhibited a higher proportion of changes in the direction of travel (termed large turns), when second in the sequence, compared to the control enclosure (A). They also made more use of the central space of the treatment enclosure (B) compared to the control (A). Leucoraja erinacea (the Little skate) exhibited a strong behavioral response to the EMF from the CSC. The cable was powered for 62.4% of the study and most frequently transmitted electrical current at 16 Amps (at 0 MW, 37.5% of time), 345 Amps (100 MW, 28.6%) and 1175 Amps (330 MW, 15.2%). In comparison to the control enclosure (A), the skates at the treatment enclosure (B) traveled further but at a slower speed, closer to the sea bed and		Tables and sections can be found in **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9).

	with an increased proportion of large turns which suggested an increase in exploratory activity and/or area restricted foraging behavior. The increased distance travelled and increased proportion of large turns was associated with the zone of high EMF (>52.5 µT, i.e. above the Earth's magnetic field) where they were more frequently recorded and spent more time.""		
North Norfolk Coast District Council (NNDC)	Chapter 11 - Fish Ecology NNDC would defer to the advice of Natural England, Marine Management Organisation, Centre for Environment, Fisheries and Aquaculture Science (CEFAS) and other experts in respect of matters within this Chapter of the PEIR.	No	Noted

8 Marine Mammal Ecology

Consultee	Comment	Development change?	Response
Natural England	Natural England's primary concern in relation to the assessment at this stage is in relation to the assessment of UXO and defining the WCS. We note that UXO charge weights up to 525kg have been presented. However, other offshore wind farms in the area (namely Dudgeon and Hornsea Project Two) have cleared UXOs with net explosive quantities up to 907kg (as mentioned in the Draft Information for Habitats Regulations Assessment for DEP and SEP, paragraph 378). Without evidence to confirm that UXO size within the DEP and SEP sites will	No	As clarified at the Expert Topic Group (ETG) 3 meeting on the 20th July 2021, UXO sizes were converted from lb to kg for consistency, however, this is not the same as the Net Explosive Quantity (NEQ) or TNT equivalent charge weights. As shown in **Table 10.4.8** of **ES Appendix 10.4 Marine Mammal**

	not exceed 525kg, we request that the noise emissions of a 907kg UXO is also modelled, to ensure any mitigation measures are suitably precautionary and cover the worst-case scenario.		**UXO Assessment** (document reference 6.3.10.4) , a 525kg NEQ is equivalent to a 1,000lb (907.2kg) air-delivered bomb so the worst case scenario has been assessed. This has been clarified in **ES Appendix 10.4 Marine Mammal UXO Assessment** (document reference 6.3.10.4). As discussed at the ETG3 and agreed by Natural England in the Agreement Log dated 20/07/2021, further underwater noise modelling for maximum UXO includes: • High-order detonation, including donor charge, without bubble curtain • High-order detonation, including donor charge, with bubble curtain • Low-order detonation, such as deflagration The further UXO underwater noise modelling has been

			included in the assessments in **ES Appendix 10.4 Marine Mammal UXO Assessment** (document reference 6.3.10.4) and has been incorporated as appropriate into the **Draft MMMP** (document reference 9.4).
	As noted above, Natural England consider that given the adjacent Race Bank offshore windfarm encountered numerous UXO, for DEP and SEP, this should be dealt with through the Application process and not by a separate marine licence.	No	As discussed at the ETG3 meeting on the 20th July 2021 and agreed by Natural England in the Agreement Log dated 20/07/2021: UXO clearance will be applied for within a separate Marine Licence application post consent and is not part of the DCO submission. However, assessments based on potential worst-case for UXO have been provided for information in the Environmental Statement (ES), **RIAA** (document reference 5.4) and **Draft MMMP** (document reference 9.4). Although it should be noted that these are indicative only. The marine licence assessments post-consent will be based on the worst case number of UXO

			devices as identified through pre-construction magnetometer surveys. It is important to note that the final MMMP for UXO will be agreed prior to UXO clearance based on the latest information, modelling, guidance and requirements at that time.
Natural England	Natural England consider most of the WCS is acceptable. However: The maximum UXO size should be increased based on data from nearby wind farms, from 525kg to 907kg. There is a small discrepancy between the maximum pin pile diameter in the WCS, and that which has been modelled.	No	As outlined above, UXO sizes were converted from lb to kg for consistency, however, this is not the same as the NEQ or TNT equivalent charge weights. As shown in **Table 10.4.8** of **ES Appendix 10.4 Marine Mammal UXO Assessment** (document reference 6.3.10.4) of the ES chapter, a 525kg NEQ is equivalent to a 1,000lb (907.2kg) air-delivered bomb so the worst case scenario has been assessed. This has been clarified in **ES Appendix 10.4 Marine Mammal UXO Assessment** (document reference 6.3.10.4).

			Further underwater noise modelling has been undertaken for 4m diameter pin-piles. This has been included in the assessments in **Section 10.6.1.1** in **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
Natural England	Natural England consider the project-specific data is acceptable. However, in terms of the published literature, the following needs to be updated: Use of Carter et al. (2020) instead of Russell et al. (2017) for seal at sea density. There has been a recent (2019/20) decline in the harbour seal population of The Wash and North Norfolk Coast SAC that has not been captured in the baseline. There is no underwater noise baseline, despite this being a requirement of the NPS.	No	All data sources and information has been reviewed and updated for the ES. As discussed at the ETG3 meeting 20 July 2021, Carter *et al*. (2020) provides a relative index of seal density at sea, rather than absolute seal densities provided by Russell *et al*. (2017). Having assessed the data, the seal density estimates used in Russell *et al*. (2017) have been used in the ES assessments and information from Carter *et al*. (2020) included for context. The latest harbour seal counts in Special Committee on Seal

			(SCOS) (2020) have been used in the updated assessments. Information on baseline underwater noise has been included in **ES Appendix 10.2 Underwater Noise Modelling Report** (document reference 6.3.10.2).
Natural England	Data analysis is fine overall. Minor points only to address.	No	All points have been reviewed and amended or updated.
Natural England	The modelling used is acceptable. There are some scenarios where the WCS has not been modelled, this needs to be updated. There are some references which we have requested they review and incorporate to the modelling as needed.	No	As above, further underwater noise modelling has been undertaken for 4m diameter pin-piles. This has been included in the assessments in **Section 10.6.1.1** in **ES Chapter 10 Marine Mammals** (document reference 6.1.10). Additionally, the underwater noise modelling report in **ES Appendix 10.2 Underwater Noise Modelling Report** (document reference 6.3.10.2) has been updated to address these comments.

Natural England	The Applicant has used quantitative assessment where needed e.g. EDRs and thresholds for disturbance. The Applicant has attempted to quantify some impacts that we would usually just expect to be assessed qualitatively. In these cases, we request for more context on the quantitative assessment provided.	No	Further clarification and justification has been provided in **Section 10.6** of **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
Natural England	An assessment of impacts from UXOs has been presented, although this is for information. The Applicant has stated a marine licence to cover UXO activities will be applied for separately to the DCO	No	As above
	We note that UXO charge weights up to 525 kg have been presented. However, other offshore wind farms in the area (namely Dudgeon and Hornsea Project Two) have cleared UXOs with net explosive quantities up to 907 kg (as mentioned in the Draft Information for Habitats Regulations Assessment for DEP and SEP, paragraph 378). Without evidence to confirm that UXO size within the DEP and SEP sites will not exceed 525 kg, we request that the noise emissions of a 907 kg UXO is also modelled, to ensure any mitigation measures are suitably precautionary and cover the worst-case scenario. Furthermore, it is not clear if the Applicant has included the likely size of donor charge required for the UXO clearance.	No	As above

Natural England	There are some assessments that need revising: Assessment of vessel traffic per day in relation to harbour porpoise disturbance thresholds Update O&M vessel movements assessment as port is known.	No	The assessment of vessel traffic has been reviewed and updated in **Section 10.6.2.3** of the **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
Natural England	Natural England have identified some plans and projects that have been omitted, or changes to their status/tiers that need to be updated. Furthermore, there are some industries that have been screened out that Natural England don't agree with	No	The CIA screening (**ES Appendix 10.3 Marine Mammal CIA Screening** (document reference 6.3.10.3)) has been reviewed and the CIA updated in **Section 10.7** of the **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
Natural England	Natural England agree that from an EIA perspective, there will be no residual significant impact on marine mammals, alone or in-combination. However, there are sections where updates to the final magnitude / sensitivity of some of the impact assessments is required.	No	All assessments have been reviewed and updated, and the magnitude / sensitivity revised, where required.
Natural England	1. Natural England advises that the seal at-sea maps produced by Russell et al. (2017) have been updated by Carter et al. (2020). Recommendation: Use the updated Carter et al. (2020) to characterise the seal at sea baseline.	No	See above response regarding use of these references. All data sources have been reviewed and updated where appropriate in **ES Chapter 10 Marine Mammals** (document reference 6.1.10).

	2. Natural England is aware of (currently) unpublished data that shows that the harbour seal population in The Wash has undergone a significant decline (20-30%) in the last 2 years (2019 and 2020) and that this should be factored into the assessment. Recommendation: Contact SMRU for more information on the recent decline of the harbour seal population in The Wash and North Norfolk SAC. Factor the reduction into the subsequent assessments e.g. revise the reference population so that it reflects the recent, lower counts.	No	All data sources have been reviewed and updated in in **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
	3. We note that UXO charge weights up to 525 kg have been presented. However, other offshore wind farms in the area (namely Dudgeon and Hornsea Project Two) have cleared UXOs with net explosive quantities up to 907 kg (as mentioned in the Draft Information for Habitats Regulations Assessment for DEP and SEP, paragraph 378). Without evidence to confirm that UXO size within the DEP and SEP sites will not exceed 525 kg, we request that the noise emissions of a 907 kg UXO is also modelled, to ensure any mitigation measures are suitably precautionary and cover the worst-case scenario. Furthermore, it is not clear if the Applicant has included the likely size of donor charge required for the UXO clearance. Recommendation: Undertake further modelling of UXO charge sizes up to 907 kg. Ensure that representative donor charge sizes are also included in the total explosive quantity detonated.	No	As above.
Natural England	4. Natural England understands that overall assessment of conservation status within the UK Marine Atlantic region	No	FCS has been reviewed and updated in **Section 10.4.1.6** of

	is “unknown” for harbour porpoise, bottlenose dolphin, white-beaked dolphin, and minke whale. Our understanding is that there is currently too little data to confidently conclude whether there has been any change in the population. We have confirmed that this is also the interpretation of the JNCC.		**ES Chapter 10 Marine Mammals** (document reference 6.1.10). and **ES Appendix Marine Mammal Consultation Responses, Information and Survey Data** (document reference 6.3.10.1).
Natural England	Natural England considers the SeaWatch sightings should be presented on a map, in order to determine the distance and therefore relevance to the project. Present the SeaWatch sightings on a Plate in the document.	No	Due to the general nature of the information provided within the SeaWatch data coupled with the fact that it is wide-ranging and lacks specific coordinates for location sightings, this has not been possible, and was not considered essential to the information provided in.
Natural England	The Applicant has stated that the UK East Coast MUs have been screened into the assessment. As the Applicant has also mentioned the northeast and southeast England MUs, we request clarity on what is meant by the UK East Coast MUs. We note that in other documents, such as the CIA (e.g. Table 12-3 and Annex 1), there is no mention of which projects are within this UK East Coast MUs (these tables specify the NE, SE and Waddenzee MUs only). Remove reference to the UK East Coast MUs or explain what is meant, also ensure that the appropriate MUs are captured in the CIA when screening in projects.	No	Reference to the UK East Coast Management Units (MU) has been reviewed and removed. No other reference is made to the East coast MU in this appendix.

Natural England	We welcome that the Applicant has screened in the Coastal East Scotland population for bottlenose dolphin. No action needed	No	No action needed
Natural England	Natural England advises that changes have been made to the Conservation of Seals Act 1970 that came into force on 01 March 2021. It is now an offence if a person intentionally or recklessly kills, injures, or takes a seal. Closed seasons no longer apply. Update the description of protection afforded by the Conservation of Seals Act.	No	Text referencing the Conservation of Seals Act 1970 has been updated in **ES Appendix Marine Mammal Consultation Responses, Information and Survey Data** (document reference 6.3.10.1).
Natural England	We assume that the Applicant meant "Under these Regulations, it is an offence if cetaceans are deliberately disturbed" (rather than specifying harbour porpoise)? Change harbour porpoise to cetaceans.	**No**	**Section** of **ES Chapter 10 Marine Mammals** (document reference 6.1.10) has been amended.
Natural England	We note that there is a broken link when cross-referencing the relevant paragraph in Chapter 12. Update the broken link.	No	This has been amended.
Natural England	We welcome the Applicant's commitment to applying for an EPS licence where required. No action needed	No	Noted.
Natural England	Natural England advise that Plate 12-0-1 should be updated to include the spatial extent of the extensions. Update Plate 12-0-1 to include the DEP site extension.	Yes	**Plate 10.1.1** in **ES Chapter 10 Marine Mammals** (document reference 6.1.10). has been updated. The aerial surveys covered both the SEP and DEP extension sites.
Natural England	Could the Applicant please confirm if the densities presented in the tables are in animals/km^2, or the total density across the site? If the latter, could the km^2 of each	No	Units have been added to text and tables in **Section 10.1.7** in **ES Chapter 10 Marine**

	site be provided to allow comparison with the published literature. Add the units (if animals/ km^2) or confirm it is across the whole site and add the total area for each site.		**Mammals** (document reference 6.1.10).
Natural England	The Applicant has specified that the DEP data in this table does not include the species grouping 'cetacean' as no density estimate available. Does that mean the SEP or the whole survey area data does include the 'cetacean' grouping? Natural England understood that this table was meant to represent known harbour porpoise sightings only. Remove the footnote reference to including cetaceans, assuming this is not meant to be included. If the footnote reference needs to be included, then clarify the wording.	No	This has been clarified and updated in **Table 10.1.12** in **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
Natural England	We welcome the Applicant's use of the Block R density estimates for bottlenose dolphin in relation to the DEP and SEP site.	No	Noted.
Natural England	Natural England notes that the IAMMWG have recently reviewed the abundance estimates for the MUs and the results of this review have just been published and are available at [redacted]. We advise that the reference populations in the baseline are updated. Notes this also applies to paragraphs 93 and 104. Update the baseline with the revised MU abundance estimates.	No	All Inter-Agency Marine Mammal Working Group (IAMMWG) MU populations have been updated in **ES Appendix Marine Mammal Consultation Responses, Information and Survey Data** (document reference 6.3.10.1).and in the ES and RIAA assessments.
Natural England	See general comment 1: Natural England advises that the seal at-sea maps produced by Russell et al. (2017) have been updated by	No	As discussed at the ETG3 meeting 20 July 2021, Carter *et al*. (2020) provides a relative

	Carter et al. (2020). Recommendation: Use the updated Carter et al. (2020) to characterise the seal at sea baseline.		index of seal density at sea, rather than absolute seal densities provided by Russell *et al*. (2017). Having assessed the data, the seal density estimates used in Russell *et al*. (2017) have been used in the ES assessments and information from Carter *et al*. (2020) included for context.
Natural England	See general comment 2: Natural England is aware of (currently) unpublished data that shows that the harbour seal population in The Wash has undergone a significant decline (20-30%) in the last 2 years (2019 and 2020) and that this should be factored into the assessment. Recommendation: Contact SMRU for more information on the recent decline of the harbour seal population in The Wash and North Norfolk SAC. Factor the reduction into the subsequent assessments e.g. revise the reference population so that it reflects the recent, lower counts.	No	Harbour seal population has been updated based on most recent seal counts in SCOS (2020) in **ES Chapter 10 Marine Mammals** (document reference 6.1.10) and **ES Appendix Marine Mammal Consultation Responses, Information and Survey Data** (document reference 6.3.10.1).
Natural England	The Applicant has specified that they will screen in any projects and plans within the Wadden Sea region for grey and harbour seal, which we welcome. We request that the Applicant provides a figure showing the spatial extent of this region that is being screened in, for clarity. Include a figure/plate showing the extent of the Wadden Sea region used for screening in plans and projects.	No	Information and maps of the relevant MU areas and Wadden Sea region have been included in **ES Appendix Marine Mammal Consultation Responses, Information and Survey Data** (document reference 6.3.10.1)

Natural England	We acknowledge that the list of sources provided by the Applicant does not comprise the full list of sources used for the CIA. However, we wish to note that the MMO public register is a useful source that could be consulted, if it has not been already. If the MMO public register has not been consulted, it is recommended that it is.	No	The MMO public register has been reviewed and the relevant information included / updated in **Appendix 10.3 Marine Mammal Cumulative Impact Assessment (CIA) Screening** (document reference 6.3.10.3).
Natural England	The Applicant has stated that Unexploded Ordnance (UXO) clearance has been initially considered in the CIA, however there is no further mention of this activity type in the CIA. The Applicant should clarify how UXO projects have been considered.	No	Further text and clarification has been included in **Appendix 10.3 Marine Mammal Cumulative Impact Assessment (CIA) Screening** (document reference 6.3.10.3)..
Natural England	The Applicant has stated that all known aggregate projects are operational. However, we wish to make the Applicant aware of that there was a marine aggregates tender round in 2018/19 ([redacted], and the dredging sites that were successful in this phase have now been offered five-year exploration and option agreements, prior to any extraction occurring. We therefore do not agree that all potential aggregate sites are operational. Furthermore, we note that although the BEIS Review of Consents states that it is not possible to assess the extent of physical (seabed) impacts from dredging, they do provide an assessment of other impact pathways e.g. underwater noise. We therefore advise that aggregate extraction and dredging require further consideration in the CIA.	No	Further consideration of aggregate extraction and dredging projects has been included in **Appendix 10.3 Marine Mammal Cumulative Impact Assessment (CIA) Screening** (document reference 6.3.10.3).and **Section 10.7.1.2.3** of the **ES Chapter 10 Marine Mammals** (document reference 6.1.10).

	Further assess the potential for marine aggregates to act in-combination with the proposed project, including consideration of the latest tender round(s).		
Natural England	Natural England understands that the Applicant has utilised the Cefas data layer of licensed disposal sites to determine the presence of any disposal sites in the region. Has the Applicant taken steps to ensure that there are no current applications for disposal sites? Confirm if/how future disposal sites have been identified.	No	Reviewed and updated in **Appendix 10.3 Marine Mammal Cumulative Impact Assessment (CIA) Screening** (document reference 6.3.10.3).
Natural England	Natural England concurs that shipping and navigation are considered as part of the baseline and do not require further consideration in the CIA.	No	Noted.
Natural England	Natural England does not agree that planned construction of sub-sea cables and pipelines can be screened out of the CIA. Though we understand that the underwater noise produced may not exceed PTS threshold, there are still other effects from underwater noise (e.g. disturbance), and there are also other pathways of effect from cable and pipelines activities e.g. effects on prey, visual disturbance. Further assess the potential for sub-sea cables and pipelines to act in- combination with the proposed project.	No	Reviewed and updated in **Appendix 10.3 Marine Mammal Cumulative Impact Assessment (CIA) Screening** (document reference 6.3.10.3).and included in **Section 10.7.1.2.5** of the **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
Natural England	Natural England does not agree that all currently known oil and gas installation projects are fully commissioned. To illustrate, there are three developments that have submitted EIAs in 2021 and are awaiting decision (https://www.gov.uk/government/collections/eia-submissions-and-decisions-2021).	No	Reviewed and updated in **Appendix 10.3 Marine Mammal Cumulative Impact Assessment (CIA) Screening** (document reference 6.3.10.3)

	Further assess the potential for oil and gas to act in-combination with the proposed project, including consideration of the applications currently submitted.		
Natural England	Natural England notes that the evidence base on underwater noise from operational wind farms has been collated from wind turbines with notably smaller capacity than is being proposed for current developments. At a strategic level, Natural England recommends that further data on operational noise from larger turbines is collected, to inform these assessments. Nevertheless, Natural England agrees with the conclusions of the Review of Consent based on best available evidence, and that operational noise from offshore wind farms can be screened out of the CIA. No action needed.	No	Noted.
Natural England	Natural England considers that the following projects/project details are missing: • Blyth Offshore Demonstrator Project – Array 4. The developer has submitted a variation to the existing licence for construction of floating offshore wind platforms in Array 4 of the consented Blyth Offshore Demonstrator array area. Construction is predicted to occur in 2025. • Norfolk Vanguard – the consent decision has been recently quashed, however, re determination is being considered so we are content for the figures to remain in at this time. • Wave Hub - granted consent. We also consider that the following projects should be considered, as they occur within the MUs specified:	No	Reviewed and updated in **Appendix 10.3 Marine Mammal Cumulative Impact Assessment (CIA) Screening** (document reference 6.3.10.3) based on relevant spatial area and potential to overlap with construction of SEP and DEP.

	• Seagreen 1A • Salamander • Isle of Man • Draig y Mor • Pembrokeshire Demonstration Zone • Celtic Sea – Floating Lease demonstration zone • Round 4 offshore wind farms These projects should be assessed in Table 12-3 too, and included in the long list in Annex I. Review and update the list of projects, their status, and their tiers prior to DCO application submission.		
Natural England	Could the Applicant please clarify whether any pathways for cumulative impacts from other marine renewable developments are being screened into the assessment? Clarify whether any pathways for cumulative impacts from other marine renewable developments are being screened into the assessment.	No	Reviewed and updated in **Appendix 10.3 Marine Mammal Cumulative Impact Assessment (CIA) Screening** (document reference 6.3.10.3), however wave and tidal projects were screened out from further consideration in the CIA.
Natural England	In Natural England's Scoping Response in 2019, we raised the following question: "Natural England queries why floating turbines are not being considered as an alternative foundation option?"	No	Due to the location, site conditions and water depth, floating turbines are not a suitable option for SEP and DEP.
Natural England	Natural England is content with the way that the consultation responses have been addressed.	No	Noted.
Natural England	See general comment 3:	No	As above.

	We note that UXO charge weights up to 525 kg have been presented. However, other offshore wind farms in the area (namely Dudgeon and Hornsea Project Two) have cleared UXOs with net explosive quantities up to 907 kg (as mentioned in the Draft Information for Habitats Regulations Assessment for DEP and SEP, paragraph 378). Without evidence to confirm that UXO size within the DEP and SEP sites will not exceed 525 kg, we request that the noise emissions of a 907 kg UXO is also modelled, to ensure any mitigation measures are suitably precautionary and cover the worst-case scenario. Furthermore, it is not clear if the Applicant has included the likely size of donor charge required for the UXO clearance. Recommendation: Undertake further modelling of UXO charge sizes up to 907 kg. Ensure that representative donor charge sizes are also included in the total explosive quantity detonated.		UXO sizes were converted from lb to kg for consistency, however, this is not the same as the NEQ or TNT equivalent charge weights. As shown in **Table 10.4.8** of **ES Appendix 10.4 Marine Mammal Unexploded Ordnance (UXO) Assessment** (document reference 6.3.10.4) a 525kg NEQ is equivalent to a 1,000lb (907.2kg) air-delivered bomb so the worst case scenario has been assessed. Underwater noise modelling for UXO includes donor charge, this has been clarified in the ES chapter and **Appendix 10.2**.
Natural England	Natural England welcomes the commitment of the Applicant to implement additional mitigation measures including a MMMP for piling activities and UXO clearance, and an SNS SAC SIP. We welcome consultation on these documents.	No	A **Draft MMMP** (document reference 9.4) and **In Principle Site Integrity Plan (SIP) for the Southern North Sea Special Area of Conservation (SAC)** (document reference 9.6) have been submitted with the DCO application incorporating any relevant consultation responses received from Natural England

			and the MMO at the pre-application stage.
Natural England	Paragraph 2.6.92 of the NPS EN-3 states that the assessment of the effects on marine mammals should include details of baseline noise levels. Such an assessment should be added to this chapter. Characterise the baseline noise levels in the development area.	No	Information on baseline underwater noise levels has been included in **Section 10.6.1.3.2** and in **Appendix 10.2 Underwater Noise Modelling Report** (document reference 6.3.10.2).
Natural England	Natural England welcomes the commitment of the Applicant to draft an IPMP and welcomes consultation on this document. Please see all other matters Annex 12.	No	An **In Principle Monitoring Plan (IPMP)** (document reference 9.5) has been submitted with the DCO application incorporating any relevant consultation responses received from Natural England and the MMO at the pre-application stage.
Natural England	See general comment 4: Natural England understands that overall assessment of conservation status within the UK Marine Atlantic region is “unknown” for harbour porpoise, bottlenose dolphin, white-beaked dolphin, and minke whale. Our understanding is that there is currently too little data to confidently conclude whether there has been any change in the population. We have confirmed that this is also the interpretation of the JNCC. Update the favourable conservation status of marine mammals.	No	FCS has been reviewed and updated in **Section 10.4.1.6** of the **ES Chapter 10 Marine Mammals** (document reference 6.1.10).

Natural England	See general comment 1: Natural England advises that the seal at-sea maps produced by Russell et al. (2017) have been updated by Carter et al. (2020). Recommendation: Use the updated Carter et al. (2020) to characterise the seal at sea baseline. As above	NO	All data and information sources have been reviewed and updated for the **ES Chapter 10 Marine Mammals** (document reference 6.1.10).. This includes, where relevant, updates to density estimates and reference populations. As discussed at the ETG3 meeting on the 20th July 2021, Carter *et al*. (2020) provides a relative index of seal density at sea, rather than absolute seal densities provided by Russell *et al*. (2017). Having assessed the data, the seal density estimates used in Russell *et al*. (2017) have been used in the ES assessments and information from Carter *et al*. (2020) included for context.
Natural England	See general comment 2: Natural England is aware of (currently) unpublished data that shows that the harbour seal population in The Wash has undergone a significant decline (20-30%) in the last 2 years (2019 and 2020) and that this should be factored into the assessment. Recommendation: Contact SMRU for more information on the recent decline of the harbour	No	All data sources have been reviewed and updated for the ES. The latest harbour seal counts in SCOS (2020) have been used in the updated assessments.

	seal population in The Wash and North Norfolk SAC. Factor the reduction into the subsequent assessments e.g. revise the reference population so that it reflects the recent, lower counts.		
Natural England	Natural England considers that, in terms of impulsive characteristics, work by Hastie et al (2019) suggested a transition from impulsive to non-impulsive noise could take place between 3 and 10 km from the piling source. However, this is preliminary work and Martin et al (2020) suggest that the change in noise characteristics from impulsive to non-impulsive does not make a difference to assessment of injury.	No	Noted. All data and information sources have been reviewed and updated for the **ES Chapter 10 Marine Mammals** (document reference 6.1.10)..
Natural England	Natural England notes that, according to Table 12-6, the impact significant from PTS during underwater UXO clearance for minke whale is major adverse, not minor adverse as written in the text. Change text to read major adverse for minke whale.	No	This has been updated to major adverse in **Table 10.4.14** of **ES Appendix 10.4 Marine Mammal Unexploded Ordnance (UXO) Assessment** (document reference 6.3.10.4)
Natural England	Natural England agrees that the MMMP measures will likely reduce the potential impact to marine mammals from UXO clearance, however we cannot comment on the suitability of the MMMP measures until we have reviewed it. Natural England understands that a draft MMMP is being submitted with the DCO application. Provide a draft MMMP in the DCO application, to enable review of suitability of measures to reduce impact severity.	No	A **Draft MMMP** (document reference 9.4) has been submitted with DCO application.
Natural England	Natural England understands that more than one UXO detonation could occur in a 24-hour period. We note that Table 12-27 (and Tables 12-25 and 12-24) presents the	No	There will be only one high order detonation in a 24-hour period. There could be more than one

	maximum number of individuals that may be affected from a single detonation. Please clarify how the potential for multiple detonations (which may affect a greater number of individuals across clearance activities), have been considered in the context of percentage of the reference population affected? Clarify how the potential for multiple UXO detonations in a 24-hour period has been taken into account in the assessment.		low-order clearance in a 24 hour period. These have been assessed as individual discrete events. However, further consideration will be given to potential for multiple UXO clearance events, if required, for the final MMMP.
Natural England	Natural England understands that in row 1 of the table, the percentage of the reference population that could be affected is 0.02% and 0.03% (based on different density estimates). As both of these are in the range 0.01%-1%, we would expect that the magnitude for both numbers would be medium, rather than the "Low to Medium" stated. Change "Low to Medium" to read "Medium".	No	This has been reviewed and updated in **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
Natural England	Natural England notes that for minke whale, 0.01% of the MU population is predicted to be impacted from monopiles. We would therefore expect the magnitude of the impact to be Medium, as opposed to Low. Though Natural England acknowledges that 0.01% is the boundary for the Low and Medium magnitude categories, in previous instances that Applicant has determined that 0.01% of the population affected constitutes Medium magnitude (in the case of PTS). For example, in Table 12-38 the magnitude of impact to harbour porpoise at SEP is Medium, as 38 individuals or 0.01% of the MU is predicted to be impacted. Change the "Low" to "Medium".	No	This has been reviewed and updated in **ES Chapter 10 Marine Mammals** (document reference 6.1.10).

Natural England	Natural England note that there are several instances in the document where a range of magnitudes are presented in a table, however only the lower of the two is mentioned in the text describing the table, and only the lower of the two is carried forward into the assessment table. For example, Table 12-47 lists the magnitude of impact on harbour and grey seal as negligible to low, whereas in paragraph 301 and Table 12-48, only negligible magnitude is written. Natural England requests that, where a range of magnitudes is presented, either both or the higher of the two (i.e. the most precautionary) is mentioned in the text and taken forward to the assessment table. The places where this has been noted are: • Table 12-47, paragraph 301, and Table 12-48 • Table 12-73, paragraph 461, and Table 12-74 • Table 12-76, paragraph 467, and Table 12-75 • Table 12-77, paragraph 482, and Table 12-78 • Table 12-79, and Table 12-80 (noting the paragraph is correct here) • Table 12-84, paragraph 546, and Table 12-85 • Table 12-91, paragraph 589, and Table 12-92 • Table 12-93, paragraph 593, and Table 12-94 Where a range of magnitudes is presented in the table that determines the magnitude, either both or the higher of the two (i.e. the most precautionary) is mentioned in the text and taken forward to the assessment table. Alternatively, justification should be provided in the text as to why the higher of the two magnitudes is not considered in the summary of the assessment.	No	This has been reviewed and updated in **ES Chapter 10 Marine Mammals** (document reference 6.1.10).

Natural England	Natural England requests that the Applicant clarify how long a break there may be between installation of pin piles, for them to be classed as sequential and not require ADD activation in between. Add text on anticipated duration of breaks between pin pile installation and cross-reference the MMMP (which we understand will be submitted alongside ES).	No	Underwater noise modelling has been undertaken to include sequential piling for four pin-piles in the same 24 hour period. The modelling does not assume any break in piling which is a worst case. The length of time in between each pin pile installation is anticipated to be two hours and therefore the Applicant does not consider that ADD re-activation and full soft start procedures would need to be implemented, as per the mitigation (and breaks in piling) procedure set out in the **Draft MMMP** (document reference 9.4). This will be clarified for the final MMMP based on the latest information and guidance.
Natural England	We advise that it is unclear why for example the value in the column 50% of individuals is not half of the value in the column 100% of individuals. Provide further explanation/clarify in the text on how the values were calculated.	No	This has been reviewed and updated in **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
Natural England	Natural England understands that the worst case (at DEP) for pin piling and one substation, plus ADD activation prior	No	This has been reviewed and updated in **ES Chapter 10**

	to both, would be 400 hours plus 25.5 hours = 425.5 hours, rather than 826 hours. Provide an explanation of how the figure of 826 was reached and/or change to 425.5 hours.		**Marine Mammals** (document reference 6.1.10).
Natural England	Could the Applicant please clarify if there are any existing main vessel routes in the SEP wind farm site? Add in text stating if there are any main vessel routes in the SEP site.	No	Text added to **Section 10.6.1.6** of the **ES chapter 13 Shipping and Navigation** (document reference 6.1.13) data indicate 13 existing main routes within the study area, with two routes crossing the SEP wind farm site, four routes crossing the DEP wind farm site and 10 crossing the export cable corridor.
Natural England	Natural England understands that current vessel traffic in the area may be up to 75 vessels per day (along the main vessel routes). The project may add up to 16 vessels per day in the site. These are the only two quantified aspects of the assessment, and together they would mean that the threshold of 80 vessels per day is exceeded. Natural England therefore requires further detail on the aspects that the Applicant state will reduce the overall vessel traffic, such as displacement and site area, before it can agree that this threshold is not exceeded. Provide further detail on the aspects that will reduce the overall vessel traffic, such as displacement and site area.	No	The Heinänen and Skov (2015) threshold level in terms of impact is for 20,000 ships per year (approximately 80 vessels per day within a 5km^2 area). Therefore, taking into account the area of SEP and DEP, the threshold of 80 vessels per day within a 5km^2 area will not be exceeded. This has been clarified in **Section 10.6.1.4.3.1** of the **ES Chapter 10 Marine Mammals** (document reference 6.1.10)..
Natural England	Natural England notes that the text in paragraph 511 is repeated almost verbatim in paragraph 513.	No	This has been amended.

	Assess whether the repeated text is needed in paragraph 513.		
Natural England	Natural England acknowledge that seals are likely to be habituated to vessel noise, to an extent. However, we advise that it is more appropriate to consider this in the assessment of the sensitivity of the receptor, rather than the magnitude of the effect. In order to determine the magnitude, could the Applicant provide further information on the number of individuals anticipated to be exposed to the effect? Include an assessment of the number of seals that may be impacted, in order to determine the magnitude of the effect. Consider the habituation in the overall sensitivity of the receptor.	No	It is not possible to provide a quantitative assessment of the number of seals that could be disturbed at seal haul-out sites, given the variables such as number of seals at the site, time of year, reaction to vessels. However, further text has been included for the assessment in **Section 10.6.1.7** of the **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
Natural England	The Applicant has provided the percentage of the wind farm area only that could be subject to seabed disturbance. Could the Applicant provide a similar area of seabed disturbance for the export cable corridor? Provide a figure of the seabed disturbance along the export cable corridor.	No	The maximum percentage of sea bed area that could potentially be disturbed across the windfarm sites and cable corridors has been included in **Section 10.6.1.8.2.1** of the **ES Chapter 10 Marine Mammals** (document reference 6.1.10)..
Natural England	Natural England notes that the percentage of the bottlenose dolphin CES MU that may be impacted due to changes in prey availability during construction at DEP is 5%. In line with previous values on the boundary between magnitude definitions, we recommend that a precautionary approach is taken, and the 5% is considered to be medium magnitude.	No	Reviewed and updated the magnitude level as suggested.

	Change to medium magnitude rather than low, and update rest of assessment accordingly.		
Natural England	We advise that the magnitudes listed in the table should reflect the worst-case magnitudes in Table 12-86 and paragraph 553, i.e. medium for bottlenose dolphin, and low for the harbour and grey seal. Update the magnitudes accordingly.	No	Reviewed and updated the magnitude levels as suggested.
Natural England	We note that this paragraph states that all marine mammals are considered as having a low sensitivity to disturbance from underwater noise from operational wind turbines. However, Table 12-92 lists marine mammals as having low to medium sensitivity. Update text in paragraph 581 to say low to medium sensitivity, in accordance with Table 12-92.	No	Reviewed and updated the sensitivity levels as suggested.
Natural England	The Applicant states that all marine mammals are assessed as having the same level of sensitivity to underwater noise from operational wind farms. However, we consider that minke whale is notably more sensitive to operational wind turbine noise, due to their sensitivity to low frequency noise. Marmo et al. (2013) used several different methods to determine sensitivity of marine mammals to operational noise from wind farms. Using one of the methods (audiogram plus sensational level), it was determined that a behavioural response could be observed in minke whale up to 18 km away. We acknowledge that there is limited evidence on the behavioural response of minke whales to operational wind farms; however, in line with the precautionary principle, we advise that the sensitivity of minke whales to operational	No	Reviewed and updated. Minke whale sensitivity to operational turbines has been updated to medium in **Section 10.6.2.1.1** of the **ES Chapter 10 Marine Mammals** (document reference 6.1.10).. Further information from Marmo *et al*. (2013) has also been included in **Section 10.6.2.1.1** of the **ES Chapter 10 Marine Mammals** (document reference 6.1.10)..

	wind turbine noise should be considered medium. We also request that the results of Marmo et al. (2013) are considered in the assessment of disturbance distance from operational wind farms. This should also be considered when assessing barrier effects from operational noise (Section 12.6.2.4). Update sensitivity of minke whales to medium. Include the results of Marmo et al. (2013) in the assessment.		
Natural England	It is noted that the Applicant has stated that the port for operation and maintenance will be Great Yarmouth. Therefore, it should be possible to have a better understanding of the main vessel routes during operation and maintenance, and therefore the proximity to any seal haul out sites. We note that the Scroby Sands grey seal haul out is in close proximity to Great Yarmouth port. If the details of the potential operation and maintenance vessel routes are available, we request that they are incorporated into the assessment. Provide a more detailed assessment of disturbance to seal haul outs as a result of O&M vessel transits from Great Yarmouth.	No	Reviewed and further information included in **Section 10.6.2.6** of the **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
Natural England	Natural England requests clarity on how the impact screening was undertaken. It is stated that impacts assessed as 'no impact" are not taken forward, however this terminology has not been used in the assessment conclusions so far i.e. residual impacts have been presented as 'negligible' as a minimum. Update the text for clarity.	No	Text has been moved to **Appendix 10.3 Marine Mammal Cumulative Impact Assessment (CIA) Screening** (document reference 6.3.10.3), reviewed and clarified.

Natural England	Based on the information presented in the CIA (Table 12-3), Natural England understands that the 'East Anglia Hub' comprises East Anglia ONE North, East Anglia THREE, and East Anglia TWO, and that any two of these projects may be piled at the same time (footnote 1 to the table). Therefore, in Table 12-103, we consider that piling at two of these projects need to be considered, rather than just one (which is how we interpret the current assessment as it states "ONE North or TWO"). This comment applies to all similar subsequent tables. Update the tables to reflect that impacts may arise from two East Anglia Hub projects at the same time, rather than just one.	No	The CIA has been updated to include two East Anglia Hub projects (East Anglia ONE North and East Anglia TWO).
Natural England	Natural England has summed the number of grey seals at risk presented in Table 12-107 and has found the total to be 218, rather than 281. The text in paragraph 735 should be updated to reflect the correct total. Update table and paragraph text to 218.	No	Reviewed and updated the number of seals.
Natural England	Natural England considers that it would be beneficial to also present the contribution of DEP and SEP together, as a percentage of the overall cumulative impact. Present the contribution of DEP and SEP combined to the overall total too.	No	Reviewed and included the contribution of SEP and DEP together in **Section 10.7.1.3.1** of the **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
Natural England	For ease of navigation, Natural England suggests that the Applicant includes hyperlinks in Table 12-122 to each impact summary table within the individual section. Include hyperlinks to earlier assessment tables in the document.	No	Links to assessment table included in **Table 10-14** of the **ES Chapter 10 Marine Mammals** (document reference 6.1.10)..

MMO	The embedded mitigation measures are detailed in Table 12-3 of Chapter 12. Measures include soft start and ramp-up procedures. Table 12-4 also details the additional committed mitigation measures and MMO support these proposals.	No	Noted.
MMO	Table 12-1 states that Section 12.6.1.3.2.1 outlines the methodology of the underwater noise modelling for piling, including the assumptions made with regard to cumulative piling in a 24-hour period. Further underwater noise modelling will be undertaken following consultation on the PEIR if more than one pile will be installed during 24-hour period, which will be appropriate. Furthermore, Table 12-2 indicates that "*assessments have been based on one pile per 24 hour, as during the installation of the first pile in any 24 hour period, marine mammals would move away from the area and would not be at risk of any further cumulative impacts from subsequent piles in the same 24 hour period. If required, this will be reviewed and updated for the ES*". Although it is expected that a marine mammal would swim away during the installation of the first pile, the piling activity over a 24-hour period still needs to be appropriately assessed.	No	Further underwater noise modelling has been undertaken to include sequential piling for two monopiles installed in the same 24 hour period or four pin-piles in the same 24 hour period in **ES Appendix 10.2 Underwater Noise Modelling Report** (document reference 6.3.10.2). This has been included in the assessments in **Section 10.6.1.3** of **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
MMO	It appears that the appropriate receptors have been scoped into the PEIR, with the key marine mammal species including the harbour porpoise, bottlenose dolphin (included as a precautionary basis), white-beaked dolphin, minke whale, grey seal and harbour seal.	No	Noted.

MMO	Appropriate data sources have been identified and evidence being proposed is generally consistent with that submitted for operations of a similar nature.	No	Noted.
MMO	The MMO notes that there is a minor discrepancy within this report and Chapter 5 -the project description. While Volume 3 Appendix 12.2 indicates the worst-case pin pile to be up to 3.5 m in diameter, installed using a maximum blow energy of 3,000 kJ, the Project Description states the worst-case will be a 4 m diameter pin pile (for 18+ MW) with a maximum hammer energy of 3,000 kJ. The MMO point towards Table 5-13 in Chapter 5 Project Description as an example.	No	Further underwater noise modelling has been undertaken for 4m diameter pin-piles in **ES Appendix 10.2 Underwater Noise Modelling Report** (document reference 6.3.10.2). This has been included in the assessments in **Section 10.6.1.3** of **ES Chapter 10 Marine Mammals** (document reference 6.1.10).
MMO	The MMO consider it would be useful to have additional information to support Figure 3-1, such as details of the piles size and hammer energy etc, in order to provide necessary context. Without this information, the MMO do not consider Figure 3-1 to be overly informative.	No	Underwater noise modelling report in **ES Appendix 10.2 Underwater Noise Modelling Report** (document reference 6.3.10.2) has been updated to address comments.
MMO	Furthermore, in relation to the above point (Paragraph 10.4), the MMO believe it would also be useful to show a selection of measured versus INSPIRE outputs for the single strike SEL, in addition to the peak sound pressure level (SPL_{peak}), especially as the SPL_{peak} is not so relevant at far ranges.	No	Underwater noise modelling report in **ES Appendix 10.2 Underwater Noise Modelling Report** (document reference 6.3.10.2) has been updated to address comments.
MMO	Section 5 and Section 5.1 state that “The calculation of underwater noise transmission loss for the non-impulsive sources is based on an empirical analysis of the noise	No	N log R and αR are reduction elements of the equation and taken off the SL. That could be

	measurements taken on transects around these sources by Subacoustech. The predictions use the following principle fitted to the measured data, where R is the range from the source, N is the transmission loss and α is the absorption loss: Source level (SL) – N log R – αR". The MMO request further clarification from the Applicant/Subacoustech that that the equation is N log R – αR (and not N log R + αR)?		SL (– N log R) (- αR) or SL - (N log R + αR), the result is the same.
MMO	The MMO note that Table 5-2 provides a summary of the estimated unweighted source levels and transmission losses for the different construction (continuous) noise sources considered. Figure 5-1 shows the 1/3 octave frequency bands used as a basis for the Southall et al. (2019) weightings used in the simple modelling. The MMO are of the understanding that propagation loss is a function of the environment. But further information is required in order to explain why the propagation loss varies quite significantly between the different sources, particularly when the source spectra (as per Figure 5-1) are not that different.	No	There are many contributors to the propagation as well as the environment, for example the size and position of the source. In these cases, there is limited data available and reliance on data from specific sites with specific conditions is required. As these sources are relatively quiet at source, the difference in the propagation coefficients have a relatively small effect on the overall conclusion.
MMO	Table 5-4 shows the predicted impact ranges for the various continuous sources. The MMO request that Applicant/Subacoustech confirm whether fleeing was considered for marine mammals.	No	All SELcum for marine mammals is based on fleeing response model, as most appropriate.
MMO	The MMO recommend that the noise modelling report/assessment includes a plot showing the predicted	No	Underwater noise modelling report in **ES Appendix 10.2 Underwater Noise Modelling**

	received levels versus range, for reference, particularly for impact piling.		**Report** (document reference 6.3.10.2) has been updated to address comments.
The Wildlife Trust	Again TWTs comments on the Scoping Report, provided directly to Equinor, have not been included in the table	No	TWTs scoping opinion response has been incorporated into the consultation tables of the relevant ES chapters and supporting documentation. However, there were no comments relevant to marine mammals.
The Wildlife Trust	It would be useful to know if the worst case scenario for offshore construction presented here (4 years if both projects are constructed sequentially, with 2 years per wind farm), is a likely scenario. Does Equinor have a preferred construction scenario out of the three they have presented in this chapter?	No	The Applicant's intention is to build both projects concurrently however flexibility is required within the consent in case this approach is not feasible (as set out in **ES Chapter 4 Project Description** (Document reference 6.1.4)). Furthermore, the Applicant will seek to develop SEP and DEP as an integrated project, with an integrated grid option providing transmission infrastructure which serves both of the wind farms being the preferred option.
The Wildlife Trust	Whilst it is likely that impacts to marine mammals from decommissioning the two offshore wind farms will be no	No	There will be no piling during decommissioning, which is the

	worse than the impacts during construction, is there any evidence that proves that this is the case?		worst-case for underwater noise for marine mammals, therefore any impacts during decommissioning would be less than construction. As outlined in **Section 10.6.3** of **ES Chapter 10 Marine Mammals** (document reference 6.1.10), potential impacts on marine mammals associated with the decommissioning have not been assessed in detail, as further assessments will be carried out ahead of any decommissioning works to be undertaken, taking account of known information at that time, including relevant guidelines and requirements. A detailed decommissioning programme will be provided to the regulator prior to construction that will give details of the likely techniques to be employed and any relevant mitigation measures required.
The Wildlife Trust	We welcome the approach by Equinor in engaging with TWT on Sheringham and Dudgeon Extensions during the evidence plan process and we hope that this can continue	No	TWT are a named consultee on the **Draft MMMP** (document reference 9.4), **In Principle SIP**

	into the post-consent stage to reflect the best practice we have been developing with other wind farm developers post-consent. TWT requests to be named on the piling and UXO MMMP, Site Integrity Plan for the Southern North Sea SAC and any marine mammal monitoring documents (including the In Principle Monitoring Plan (IPMP)). We look forward to discussing this in more detail with you over the coming months.		**for the Southern North Sea SAC** (document reference 9.6) and any marine mammal monitoring documents (including the **Offshore IPMP** (document reference 9.5). TWT will also be consulted during production of the final plans post consent.
The Wildlife Trust	We look forward to engaging with Equinor on the development of marine mammal monitoring, which is of particular importance for the Southern North Sea SAC. TWT also suggests that a strategic approach to monitoring should be implemented within the SAC which would yield better results and be a better use of individual developer resources. We recognise that this lies largely outside of Equinor's gift in terms of this project, but we would welcome a conversation with industry, regulators and SNCBs on how this can be achieved.	No	As outlined in **Section 10.11** of **ES Chapter 10 Marine Mammals** (document reference 6.1.10)., the monitoring requirements for marine mammals will be finalised post-consent based on the latest information, guidance and requirements and will be in accordance with monitoring proposals outlined the **Offshore IPMP** (document reference 9.5).
The Wildlife Trust	We are disappointed that fishing has been considered as part of the baseline and has not been included in the CIA for marine mammals. Fishing has been scoped into the CIA for other receptors in this report, such benthic ecology (Table 10-22, p106) and we are uncertain as to why this approach has not been consistently applied across the PEIR.	No	This approach is consistent with the Review of Consents (RoC) HRA for the SNS SAC and CIA for other OWFs, such as Norfolk Boreas, Hornsea Project 4.

	Fishing is a licensable activity that has the potential to have an adverse impact on the marine environment, including marine mammals. This is supported in the leading case C-127/02 Waddenzee [2004] ECR I-7405, the CJEU held at para. 6. "*The act that the activity has been carried on periodically for several years on the site concerned and that a licence has to be obtained for it every year, each new issuance of which requires an assessment both of the possibility of carrying on that activity and the site where it may be carried on, does not itself constitute an obstacle to considering it, at the time of each application, as a distinct plan or project within the meaning of the Habitats Directive*" This case law demonstrates that fishing is considered a plan or a project and therefore, not part of the baseline.		Further text and justification is provided in **ES Appendix 10.3 Marine Mammal CIA Screening** (document reference 6.3.10.3).
The Wildlife Trust	Is Equinor satisfied that 525kg is the maximum worst case charge weight that will be encountered across the project? Equinor mentions in the following paragraph that a maximum charge weight of 907.2kg (for a 2,000lb UXO) was needed at the original Dudgeon project and Hornsea Project Two, both situated in close proximity to SEP and DEP. Is there reason to believe that a charge weight of this size will not be needed for SEP and DEP?	No	As clarified at the ETG3 meeting on the 20th of July 2021, UXO sizes were converted from lb to kg for consistency, however, this is not the same as the NEQ or TNT equivalent charge weights. As shown in **Table 10.4.8** of **ES Appendix 10.4 Marine Mammal UXO Assessment** (document reference 6.3.10.4), a 525kg NEQ is equivalent to a 1,000lb (907.2kg) air-delivered bomb so the worst case scenario has been

			assessed. This has been clarified in **ES Appendix 10.4 Marine Mammal UXO Assessment** (document reference 6.3.10.4).
The Wildlife Trust	Whilst we appreciate the inclusion of UXO information from nearby projects, Equinor has not provided an indicative figure for UXO clearances specific to DEP and SEP. We expect all offshore wind farm developers to undertake more pre-consent surveys to gain a realistic figure of required UXO clearances. TWT believes UXO clearance activity should be conditioned at the DCO stage, through the inclusion of a dML, then it could be better planned and managed in combination with other projects. TWT suggests that a condition is included as part of the licence where the applicant will submit refined data on the number of UXO clearances once seismic surveys have been undertaken, in order to further support and justify UXO clearance activity, similar to the East Anglia One North and East Anglia Two applications.	No	As agreed with Natural England and the MMO at the ETG3 meeting on the 20th July 2021 and agreed by Natural England in the Agreement Log dated 20/07/2021, UXO clearance will be applied for within a separate Marine Licence application post consent and is not part of the DCO submission. However, assessments based on potential worst-case for UXO have been provided for information in the ES, **RIAA** (document reference 5.4) and **Draft MMMP** (document reference 9.4). Although it should be noted that these are indicative only. The marine licence assessments post-consent will be based on the worst case number of UXO devices as identified through pre-construction magnetometer surveys.

			It is important to note that the final MMMP for UXO will be agreed prior to UXO clearance based on the latest information, modelling, guidance and requirements at that time.
The Wildlife Trust	We would appreciate if the applicant could please clarify whether they are referring to low-order or low-yield clearance technologies or both in future documents? We request that when the draft UXO-specific MMMP is developed, Equinor commits to recording and providing information on the success rate of the technology during the project to regulators, SNCBs and other interested parties such as TWT to confirm the effectiveness of the technique in mitigating the impacts of underwater noise. If Equinor intends to use low-yield technology then the requirement to use a bubble curtain should form part of the licence condition, due to the lack of evidence surrounding this technique.	No	Text clarified when referring to low-order clearance. A **Draft MMMP** (document reference 9.4) has been submitted with the DCO application. All UXO clearance operations will be conducted based on the latest guidance and requirements for mitigation and monitoring at that time. This will be agreed for the final MMMP. Assessment of potential impacts from UXO clearance have been provided with the ES for information (see **ES Appendix 10.4 Marine Mammal UXO**

			Assessment (document refence 6.3.10.4)).
The Wildlife Trust	We do not agree with the assessment of medium magnitude to describe a permanent impact (PTS) to 870.73 harbour porpoise individuals. Harbour porpoise are a European Protected Species (EPS) which are afforded strict protection under Article 12 of the Habitats Directive, transposed into UK law by The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended in 2009 and 2010). The Regulations prohibit the deliberate capture, injury, killing or disturbance of EPS. We do not feel that permanent damage to 870.73 individuals, which may be linked to the nearby SNS SAC, should be ranked the same as permanent damage to 2.84 minke whale individuals.	No	Assessments of magnitude have been reviewed. Assessments are based on the agreed approach on percentage of the population (MU) that could be impacted. It is important to note that the magnitude of impact referenced is prior to the application of mitigation that would be implemented to reduce the risk of PTS in marine mammals. Assessments are based on worst-case scenario without mitigation.
The Wildlife Trust	Does Equinor intend to employ bubble curtains for low order disposal as well as high order disposal?	No	All UXO clearance operations will be conducted based on the latest guidance and requirements for mitigation and monitoring. This will be agreed for the final MMMP.

The Wildlife Trust	TWT note the commitment that there will be no concurrent UXO clearance between the two sites. If construction is occurring simultaneously, careful planning and scheduling between the projects will be necessary to ensure that these projects do not overlap and cause an adverse impact to the Southern North Sea SAC.	No	The Projects have committed to no concurrent high-order UXO detonations between SEP and DEP.
The Wildlife Trust	The worst case PTS range for harbour porpoise (13.6km) is greater than the stated ADD effectiveness range for reducing harbour porpoise PTS (4.9km), even if the ADD is employed for 55 minutes to increase the effectiveness range (10.3km). Therefore we do not agree with the residual impact conclusion of minor adverse in paragraphs 288-289. A great deal more work is required to understand the effectiveness of current mitigation for underwater noise impacts and to develop better options if the current mitigation is found to be inadequate. TWT suggests that monitoring is undertaken to confirm the effectiveness of ADD if this is utilised.	No	The use of ADDs is provided as an example of proposed mitigation. The final MMMP for piling, including mitigation and monitoring will be agreed prior to piling based on latest information, guidance and requirements.
The Wildlife Trust	Could Equinor please confirm that they will not be undertaking UXO clearance and piling concurrently at DEP or SEP in isolation or across both of the projects? If there is a possibility that UXO clearance activities and piling will be happening at the same time, the worst case scenario will need to be altered to reflect this.	No	The Applicant has committed that there will be no high-order UXO detonations and piling concurrently at SEP or DEP in isolation or across both of the projects.
The Wildlife Trust	All of the research mentioned in this section concerning the impacts from underwater noise associated with operational wind turbines is based on turbines smaller in	No	Reference to Stober and Thomson (2020) and Tougaard *et al.,* (2020) which looked at

	size than the turbines being considered for DEP and SEP. There is recent evidence to suggest that operational noise increases with size of wind turbines[1]. Therefore, it would be useful to consider monitoring and verification of operational noise levels of larger turbines as part of this project.		underwater noise from operational turbines has been added to the ES chapter. The potential impact is assessed as negligible and therefore it is not proposed to monitor operational turbine noise at SEP and DEP.
The Wildlife Trust	We cannot currently agree with the conclusions of Table 12-108 that the use of a project specific SIP for the SNS SAC would reduce the residual impact to 'minor adverse' as there is currently no regulatory mechanism in place for managing the in-combination impacts from multiple SIPs. TWT is hopeful that this mechanism will be in place by the time construction commences on this project, through the efforts of the Underwater Noise Strategic Advisory Group, but as it is not yet in place we cannot agree with the conclusion presented in this table. We suggest that mitigation is likely to be required for cumulative impacts, especially in relation to EPS.	No	The **In Principle SIP for the SNS SAC** (document reference 9.6) sets out the approach to delivering measures for SEP and DEP to ensure the avoidance of significant disturbance of harbour porpoise during piling works, in relation to the SNS SAC Conservation Objectives. The approach and measures in the SIP are in relation to SEP and DEP only and are in response to the conclusions of the **RIAA** (document reference 5.4).
National Trust	Impact on Seal Populations	No	Where possible and safe to do so, transiting vessels would

	National Trust has noted that the PEIR has assessed the impact of the proposed extensions during both construction and operation on the grey and harbour seal populations. The closest haul-out site to the extension area is at Blakeney Point which is within National Trust ownership. It has been noted that it is considered there will be negligible to minor adverse impact on this site as a result of the proposals, given the minimum 12km distance, however National Trust would request that the proposed mitigation of maintaining transiting vessels 600m or more off the coast near seal haul-out areas, especially during sensitive period, is incorporated into any future management regime.		maintain distances of 600m or more off the coast, particularly in areas near known seal haul-out sites during sensitive periods. Vessel movements to SEP and DEP from the chosen construction port(s) (anticipated to be Great Yarmouth therefore avoiding interaction with the Blakeney Point seal haul out site) would use direct established routes and are unlikely to be close to the shore, or within the distance required to cause a disturbance impact, based on the distance thresholds (300m for grey seal and 600m for harbour seal), except when near the port to avoid the risk of collision and grounding. This has been incorporated into the **Outline Offshore Project Environmental Management Plan (PEMP)** (document reference 9.10).

Vattenfall Wind Power Limited	VWPL note that both the DEP and SEP projects include monopile and piled jacket options for foundations and that although only indicative programs for construction have been provided at this stage there is potential for the Unexploded Ordnance (UXO) clearance and piling activities to overlap with the construction programmes for both Norfolk Vanguard (no piling overlap currently identified) and Norfolk Boreas (possible piling overlap currently identified). Equinor have identified the potential for cumulative impacts for a number of species including harbour porpoise, bottlenose dolphin, white beaked dolphin, minke whale, and grey and harbour seal. Given the potential for overlapping construction programmes it will be essential that Equinor keep VWPL, and Norfolk Boreas and Norfolk Vanguard updated as UXO and construction programmes are developed and once more certainty around these timeframes is available.	No	The Applicant will endeavour to keep VWPL, and Norfolk Boreas and Norfolk Vanguard updated as UXO and construction programmes are developed and once more certainty around these timeframes is available. Similarly, the Applicant requests if VWPL, and Norfolk Boreas and Norfolk Vanguard could also keep the Applicant updated as UXO and construction programmes are developed and once more certainty around these timeframes is available.
Vattenfall Wind Power Limited	VWPL note that the DEP and SEP projects are located outside of the Southern North Sea Special Area of Conservation (SAC) but are within 14.1km at the closest point. Therefore, there is potential for Likely Significant Effects on the SAC to occur. It will therefore be important to consider the cumulative effects of the DEP and SEP projects with the Norfolk projects within the Habitats Regulations Assessment and further information on timing of activities will be key to reducing the risk of possible effects to the SAC. VWPL are willing to share current anticipated construction programmes for Norfolk Vanguard	No	The Applicant welcomes that VWPL are willing to share current anticipated construction programmes for Norfolk Vanguard and Norfolk Boreas during the development of the SEP and DEP DCO application documents. Similarly, the Applicant would be willing to share current anticipated construction programmes for SEP and DEP

	and Norfolk Boreas with Equinor during the development of the DEP and SEP DCO application documents.		with VWPL during the development of the Norfolk Vanguard and Norfolk Boreas post-consent / pre-construction documents.

9 Offshore Ornithology

Consultee	Comment	Development change?	Response
Natural England	Due to the consultation timeframes and size of documentation Natural England has limited PEIR comments to focus on priority areas within the offshore ornithology impact assessment, with a view to ensuring that the DCO application is submitted with the most complete and robust data sets and analyses required to inform both the EIA and HRA assessments of SEP and DEP, and the focal species and colonies (in particular those that present the most significant consenting risk to the projects) are assessed in the most appropriate way.	No	Noted. The Applicant also notes that Natural England have not reviewed elements of the assessment prior to submission of the DCO application. Notably, Natural England did not comment on the conclusions of the draft Information to Inform Habitats Regulations Assessment.
Natural England	Natural England are making no comment on the conclusions drawn regarding ornithological impact as part of either EIA or HRA; however, we draw the Applicant's attention to recent advice Natural England has provided to OWFs in Examination (EA1N Appendix A19 - NE Comments and Conclusions on	No	Noted. The information from the supplied reference has been drawn upon when producing **ES Chapter 11 Offshore Ornithology** (document reference 6.1.11).

	EIA Scale Impacts Deadline 8.pdf), in regards to impacts at both HRA and EIA scales.		
Natural England	Natural England have prioritised reviewing the key HRA sections on: • Greater Wash SPA (red-throated diver and sandwich tern via NNC SPA review) • North Norfolk Coast SPA (sandwich tern) • Flamborough and Filey Coast SPA (all qualifying species)	No	Noted.
Natural England	The following sections of Chapter 13 and the HRA report, have NOT been reviewed: • Interpretation of impacts (at HRA or EIA scale) • Impacts on non-focal species • Impacts that are generally lower-consenting risk (e.g. indirect effects) Instead, Appendix 13.1 and Appendix 13.2, have been reviewed as these contain crucial information on the underlying data.	No	Noted. This means that Natural England have not reviewed elements of the assessment prior to submission of the DCO Application.
Natural England	Project parameters are clearly defined, but it is not clear whether worst case scenarios have been.	No	The assessment makes use of the template for presenting the worst case scenario that Natural England have prepared. The information is presented in **Section 11.3.2** in **ES Chapter 11**

			Offshore Ornithology (document reference 6.1.11).
Natural England	Natural England continue to be concerned by the limited number of transects within the individual reporting regions and the use of design-based, rather than a model-based analysis approach. It is important to note that employing a design-based approach requires that the survey design (transect orientation, spacing etc.) has been carefully considered, particularly when study regions are non-rectangular (Thomas et al, 2010).	No	As requested by Natural England, model-based density estimation has been considered for Sandwich tern only, and is presented in **ES Appendix 11.1 Offshore Ornithology Technical Report** (document reference 6.3.11.1) The impact assessment uses both design-based and model-based density estimates throughout, to enable comparisons to be made between the outputs. Thomas et al. (2010) makes reference to the use of sawtooth and zigzag transect designs when dealing with non-rectangular study regions. However, since the aerial survey study area (and hence SEP and DEP) themselves rely on a parallel transect design, this point is not applicable.
Natural England	We request that more information is provided regarding the survey data and survey design that has been used to	No	The transect design has been provided on **Figure 11.1** of **ES**

	calculate the abundances/densities. Some of the reasons given as to why a model-based approach would not be appropriate centre around spatial coverage and sample size. We request that a clear figure of survey design and information on transect length per reporting region and % coverage per reporting region is provided, and that the number of observations per reporting region (for focal species at least) are provided.		**Chapter 11 Offshore Ornithology** (document reference 6.1.11). The approximate transect lengths and approximate percentage coverage achieved by the study design in each reporting region is presented in **ES Appendix 11.1 Offshore Ornithology Technical Report** (document reference 6.1.11)
Natural England	In regards spatial coverage, we note a minimum target of 10% coverage was set. However, no detailed information has been provided on how the survey design was arrived at. Surveys need to have been designed to collect a representative sample on bird density across the survey area. Independent samples are typically considered to be individual transects or survey grids. Too little coverage and/or too few independent samples may lead to density estimates lacking in accuracy and/or precision. This can result in inaccurate estimates of abundance and distribution, potentially with wider confidence intervals than would be attained with more comprehensive sampling. This in turn can lead to a wider range of estimates of potential impacts and reduce the future ability to detect changes in bird abundance and distribution. The Applicant has commissioned digital aerial surveys conducted using 4 video cameras but has only analysed and presented data from 2 cameras. On Natural England's request the Applicant conducted a preliminary assessment of	No	Noted. In response to Natural England's concerns, coverage for all surveys between March and September has been increased to 20%, for all species recorded during these surveys. This has been achieved through the analysis of additional camera data collected during baseline surveys carried out between March and September. This time period was selected as it encompasses the breeding season for all key species considered by the assessment. The coefficient of variation values for each density estimate have been presented in **ES Appendix**

	whether the analysis of 4 cameras (vs 2) improved the precision of the abundance/density estimates. Following presentation of these findings at an Evidence Plan Topic Group, Natural England advised that the analysis of 4 cameras should be considered for focal species in key months, as the preliminary findings suggested there was greater benefit when abundance/density was higher. We note that if all data collected had been analysed (i.e. from all 4 cameras) for each monthly survey to generate density and population estimates for species there would have been coverage of approximately 20% of the survey area for each survey. The level of coverage that can be considered sufficient for baseline characterisation will depend on the nature of the area being surveyed and the abundance and distribution of receptors across the area. If a narrower transect width is used for surveys (e.g. a 250m transect width for 2 cameras, rather than a 500m width for all 4 cameras) then it is likely that a larger number of transects will be needed to achieve the same level of precision as would be derived from a sample of wider transects (Buckland et al., 2012; Thaxter and Burton, 2009). We also request that an associated measure of the level of precision (e.g. % coefficient of variation) is presented for density/abundance figures of focal species.		**11.1 Offshore Ornithology Technical Report** (document reference 6.3.11.1).

Natural England	We would expect that evidence from a power analysis of existing data sets to be used, in order to demonstrate that the survey coverage and design selected would provide an adequate baseline characterisation. If at the Examination stage the survey design and/or percentage coverage are questioned by the Examining Authority, SEP and DEP would need robust evidence to justify the approach taken.	No	It is unclear why power analysis would be expected. The Applicant is not aware of this technique informing study design for other OWFs. The survey design employed for DEP and SEP is comparable to baseline survey programmes employed at other OWFs which have received consent. With respect to the size of the study area relative to the OWFs, and survey coverage, the study design of DEP and SEP substantially exceeds what has been carried out by many other OWFs.
Natural England	Natural England advises that best practice is to use the Natural England PVA tool to create up to date, robust and consistent population models for all species that require population modelling, rather than depending on past population models presented in previous applications. Natural England requests that up to date population models are presented for gannet, guillemot, razorbill, and kittiwake, using the Natural England PVA tool, and providing the associated log file for each model built. This ensures transparency and consistency. We would be pleased to have further discussions with the Applicant on this process, prior to submission of the DCO application.	No	PVAs for North Norfolk Coast SPA Sandwich tern, and Flamborough and Filey Coast SPA gannet, guillemot, kittiwake and razorbill have been prepared and included within the assessment. Details are presented in **ES Appendix 11.1 Offshore Ornithology Technical Report** (document reference 6.3.11.1).

Natural England	We note that for Sandwich tern, the in-combination assessment should include all OWFs within the relevant BDMPS outside the breeding season, in this case the UK North Sea and channel BDMPS.	No	The cumulative and in-combination assessment includes all data that could be located for impacts on North Norfolk Coast SPA Sandwich terns during the non-breeding season. The sources are referenced in the text as they are referred to, and are all listed in the references section at the end of the chapter.
Natural England	We would like to request the following additional information is provided, in order to allow Natural England to assess the robustness of the underpinning analyses: 1. PVA log files 2. Band spreadsheets for all CRM presented 3. All data presented according to Natural England template (as attached) 4. Survey information as per above (including number of observations per survey per species, survey effort per reporting region, distribution maps of key species)	No	All of the requested data have been supplied as part of the assessment and can be found in **ES Appendix 11.1 Offshore Ornithology Technical Report**. (document reference 6.3.11.1).
Natural England	*'...the area of sea within the boundary of the Greater Wash SPA, as defined by its other features, holds one of the largest known wintering populations of little gull in the UK and therefore merited classification as an SPA according to the UK SPA selection guidelines. However, birds outside the boundary of the SPA are not considered to be part of the qualifying feature. The birds present at SEP and DEP are therefore not part of the qualifying feature, which is screened*	No	Following discussions on this point, little gull has been screened into the **RIAA** (document reference 5.4).

	out as no impacts on it are predicted.' This doesn't seem to be consistent with the reasoning presented for the screening in of Sandwich tern at Greater Wash SPA. These birds remain qualifying features of the Greater Wash SPA when outside the boundary of the site (para 1225). Please clarify why different approaches have been taken.		
Natural England	Natural England is not only concerned about the additional displacement from SEP turbines on the distribution of red-throated divers within the Greater Wash SPA, but also from associated activities. Please see our advice for the EA1N examination as there are similar issues albeit to a different SPA. We advise that as a minimum the best practice protocol for mitigating vessel disturbance on red-throated diver should be adopted for any transiting vessels associated with the works i.e. • Avoiding transiting the site between 1st November and 1st March (inclusive) • selecting routes that avoid known aggregations of birds; • restricting (to the extent possible) vessel movements to existing navigation routes (where the densities of divers are typically relatively low);• maintaining direct transit routes (to minimise transit distances through areas used by divers); • avoidance of over-revving of engines (to minimise noise disturbance); and,	No	The Applicant has committed through the **Outline Project Environmental Management Plan (PEMP)** (document reference 9.10) to implement a best practice protocol for minimising disturbance to red-throated divers. Measures are included in **Table 11-4** of **ES Chapter Offshore Ornithology** (document reference 6.1.11)

	• briefing of vessel crew on the purpose and implications of these vessel management practices (through, for example, tool-box talks). However, we note that there is a potential for cable installation and O&M reburial work to be undertaken for ~ 6 months (~110 - 180 days) within the footprint the Greater Wash SPA. Therefore, red-throated diver in the vicinity of the export cable could be displaced for the full over wintering period for this species. Natural England is increasingly becoming concerned in relation to disturbance and/or displacement of red-throated divers from the more persistent presence of OWF-related vessels. In this context of increasing vessel activity, we consider that a 'worst case scenario' of ~ 180 days of cable burial during the period that red-throated diver are likely to be most sensitive (1st November to 1st March inclusive) could make a meaningful contribution to in-combination effects on the SPA. This gives further weight to the need for a seasonal restriction for cable installation/remediation works. As a result of this we advise that there is a likely significant effect from the proposals alone and in-combination which should be considered in the HRA.		
Natural England	Greater Wash SPA Sandwich tern: Please refer to comments below in relation to Sandwich tern at the North Norfolk Coast SPA, most comments also relate to the assessment conducted for Greater Wash SPA.	No	This information is noted and the advice applied to assessments of both SPAs.

Natural England	Regarding the 2km buffer around cable laying vessels used for displacement calculations, mortality figures presented in text are not referenced to a table/appendix. Also, it is not clear where these are from. Present method/matrix used to quantify/assess displacement effects during construction.	No	The matrices that underpin the assessment of disturbance and displacement in the construction phase of SEP and DEP are presented in **ES Appendix 11.1 Offshore Ornithology Technical Report** (document reference 6.3.11.1).
Natural England	Paragraph 1298 states 'no AEoI due to in-combination effects of export cable corridor', but this section refers to operational phase.	No	This section of the **RIAA** (document reference 5.4) has been checked and amended.
Natural England	*"Numbers have decreased at many of the SPA sites, but have increased at some, including the North Norfolk Coast SPA and Ramsar site, such that the overall population change since designation is small."* Note this means that the North Norfolk Coast SPA is a key site in regards the UK SPA network. Natural England advise this should be taken into account when considering impacts to this population.	No	The current status of the North Norfolk Coast SPA and the wider suite of SPAs supporting breeding Sandwich terns have been considered during the preparation of **ES Chapter 11 Offshore Ornithology** (document reference 6.1.11).
Natural England	There are some discrepancies between the figures presented here (Table 9.11) and those supplied to us by RSPB. Please note, there are some small discrepancies between the numbers presented here and those supplied to by Natural England and RSPB. Please double check.	No	Sandwich tern counts at the North Norfolk Coast SPA referred to throughout this assessment have been taken from the JNCC Seabird Monitoring Programme Database (JNCC, 2022).

Natural England	*"The selection of a preferred breeding location generally shifts every few years and is thought to be due to a number of reasons. These include the presence of black-headed (positive factor) and large gulls (negative factor) at the start of the breeding season, the presence of non-avian predators (e.g. foxes), and the state of vegetation. Sandwich terns are highly vulnerable to mammal predators and declines at colonies are most often related to an increase in predator access, especially to foxes, but also rats, stoats and American mink."* Are these comments colony specific (and if so informed by who/what?) or from Mitchell et al. (2004)?	No	These comments were taken from discussions held with Bureau Waardenburg, made with the benefit of several years of experience of tagging Sandwich terns at Scolt Head.
Natural England	Natural England note the reference to the latest mean peak count or equivalent in the abundance attribute, and welcome engagement around the most suitable parameterisation of the Sandwich tern PVA	No	The Applicant agreed that additional consultation regarding PVA would be beneficial. A workshop was therefore held in November 2021.
Natural England	*"Displacement rates of 30% to 50%, and a maximum mortality rates of 1% to 5% of displaced birds, are considered as the potential range of displacement effects."* Please provide an explanation (or reference to where the explanation is provided) as to why these rates have been selected.	No	Additional work carried out since PEIR has resulted in displacement rates for Sandwich tern being set at 0% to 50%, and mortality rates of displaced birds at 1%. The evidence and reasoning supporting this is presented in **Section 11.6.2.1.3.5** of **ES chapter 11 Offshore Ornithology** (document reference 6.1.11).

Natural England	*"Due to data availability, only birds in flight are included in the totals for OWFs other than SEP and DEP."* It would be good to present the implications of only using birds in flight data, by presenting the % of birds in flight vs all birds for SEP and DEP in this section (Natural England note this is presented in para 24 appendix 13.2).	No	No changes to the assessment have been made in light of this comment, since the suggested change would have virtually no effect on the assessment, and would not change the outcome or conclusions.
Natural England	*"When combined, this would increase the baseline mortality of the SPA breeding population (989 adult birds per year based on an adult population of 9,700 individuals and the adult mortality rate of 0.102)"* This is the 2018 population size. Please clarify why this has been selected?	No	In the years during the collection of the majority of baseline data (2018 and 2019), the mean Sandwich tern population of the North Norfolk Coast SPA was 9,443 individuals. The baseline annual mortality of this population, assuming an adult mortality rate of 0.102 (Horswill and Robinson, 2015), is 963 birds. This population and baseline mortality are used as the basis of the increase in mortality calculations. For population modelling, the mean count between 2010 and 2019 of 8,369 individuals was used as the starting population. The baseline annual mortality of the 2010 to 2019 mean population, assuming an adult

			mortality rate of 0.102 (Horswill and Robinson, 2015), is 854 birds.
Natural England	*"The context of a population that has experienced a mean annual growth of 8.5% between 2010 and 2020 (Section 9.3.2.1)."* Natural England advise the 2020 figure should be excluded from calculations at this point, as: i) It is likely that the increase in population size was actually due to an influx of birds from a failed Dutch colony that moved to North Norfolk later in the spring. This has been evidenced via both ringing and colour ringing observations (T. Bolderstone, NE senior reserve manager, pers comm. 2021) ii) The survey data collected to inform SEP and DEP covers the 2018-2019 breeding seasons (with the exception of April 2020).	No	The Applicant agrees. The ES and **RIAA** (document reference 5.4) do not use 2020 count data for the North Norfolk Coast SPA in quantitative assessment.
Natural England	*"Table 9-19: In-combination collision risk for Sandwich terns of the North Norfolk Coast SPA and Ramsar site using consented OWF parameters, avoidance rate 0.9883."* Please clarify why the in-combination total for all Greater Wash OWF (excluding SEP and DEP) is so much lower than the original DECC AA. Presumably this is due to a number of differences in regards CRM selection, flight height, etc. Clarity on this critical issue is needed.	No	A formal sensitivity analysis has not been carried out, but it is suspected that the use of the Option 2 flight height distribution in PEIR ("Corrigendum," 2014; Johnston et al., 2014) is the main contributory factor to this observation. The use of the Harwood (2021) flight height distribution returns CRM outputs to levels similar to those reported in DECC (2012).

Natural England	Where is the information on as built wind farm parameters presented? On the question of as-built parameters, please see Natural England Response to EA1 Non Material Change Application regarding the appropriateness of using as-built values.	No	This information is presented in **ES Appendix 11.2 Information to Inform the Offshore Ornithology Cumulative Impact Assessment** (document reference 6.3.11.2).
Natural England	*"Table 9-25: Predicted in combination seasonal and annual collision and displacement mortality for Sandwich tern apportioned to the North Norfolk Coast SPA."* These figures appear to be the 'as-built' CRM figures, please make this clear in the legend. As Natural England have previously advised, consented figures should be used unless the 'as built' parameters have been legally secured.	No	The assessment generally utilises the consented OWF design CRMs when drawing conclusions, but reference to more realistic OWF designs is made to ensure that an appropriate level of precaution is used and understood within the assessment.
Natural England	PVA time span should represent windfarm life span - 35 years. Please correct.	No	All PVAs have been altered to run for 40 years (the lifetime of SEP and DEP). It has been assumed that all other OWFs considered within the cumulative and in-combination will also continue to operate throughout this period. This, along with the use of consented OWF parameters, mean that there is a considerable risk that impacts are overestimated.

Natural England	*"It is nevertheless assumed on a precautionary basis that all gannets subject to impacts of collision and displacement at SEP and DEP during the breeding season are breeding adults from the SPA."* It would be useful to state the breeding season months here and confirm that the breeding season is considered to be March – September, in line with what Natural England advise (Furness, 2012).	No	The text has been amended to incorporate the breeding season months. This also applies to similar text for other species.
Natural England	*"Seasonal and annual population estimates of gannets at SEP and DEP, within the extension sites and a 2km buffer, are given in Table 9-37. This table also includes seasonal and annual population estimates for all OWFs included in the in-combination assessment (for the development and a 2km buffer where available, although the buffer zones for in-combination sites included in this assessment varied between 0km and 4km depending on the data available."* It would be useful if there was a table presented or the figures highlighted in the raw data in PEIR Appendix 11.1 Offshore Ornithology Technical Report, Royal Haskoning DHV (2021) to show exactly which data from the survey have been used to calculate the figures in Table 9-37.	No	Whilst this request was considered, it was deemed challenging to achieve whilst retaining the existing presentation of the baseline data. It has therefore not been included for gannet, or other species.
Natural England	*"Seasonal and annual population estimates of gannets at DEP, SEP and other OWFs included in the in-combination assessment, apportioned to Flamborough and Filey Coast SPA."* Please inform us of the source for the figures provided for	No	Natural England's Relevant Representations for the Hornsea Project Four DCO Examination (Natural England, 2021) make it clear that a range of aspects of the assessment methodology

	Hornsea Project Four in Table 9-37. At present Natural England advise using the Hornsea Project 4 PEIR figures as the most recently published figures.		have not been carried out to their suggested methodologies. For this reason, the estimated impacts due to Hornsea Project Four for all species are taken from the PEIR.
Natural England	*"At displacement rates of 60% to 80% and a maximum mortality rate of 1% for displaced birds, a maximum of three SPA breeding adults would be predicted to die each year (Table 9-38). This would increase the baseline mortality of the SPA breeding population by a maximum of 0.15%."* Please provide matrices for Upper Confidence Limits and Lower Confidence Limits.	No	The matrices that underpin the assessment of disturbance and displacement in the operational phase of SEP and DEP for all relevant species are presented in **ES Appendix 11.1 Offshore Ornithology Technical Report** (document reference 6.3.11.1).
Natural England	*"Breeding season apportionment of collisions to Flamborough and Filey Coast SPA is as per MacArthur Green and Royal HaskoningDHV (2021b)."* Provision of reference only is insufficient. Define in text. It is not clear what breeding population has been used for FFC SPA. Has the most recent SPA population been used, as for the calculation of baseline adult mortality (1509)?	No	Apportioning methods have been explained in the **RIAA** (document reference 5.4) text. For apportioning, the data in Furness (2015) has been used, and not the most up to date colony counts.
Natural England	*"Mean peak abundance estimates (with range of recorded peak values) recorded for species recorded in the aerial survey study area during the baseline surveys, by biologically relevant season. Part seasons covered by the aerial survey programme have been included as full seasons by the mean*	No	The mean peak abundances of the wider aerial survey study area presented do not feed directly into quantitative elements of the assessment. However, it is

	peak calculations. Dashed cell indicate where a season does not apply to a given species for the purposes of the assessment." This appears to be peak abundance across the entire survey area (this covers SEP and DEP regions and a large area in between. Is this useful? Mean peak is relevant to displacement, but not used in CRM.		considered to be useful background information as it demonstrates the peak numbers of marine ornithology receptors present in the wider area during different seasons and has therefore been provided for context.
Natural England	*"Average annual survival rates of offshore ornithology receptors across age classes, along with productivity and average mortality rate for entire population calculated using age-specific demographic rates and age class proportions average mortality rate for entire population calculated using age-specific demographic rates and age class proportions"* This should be referenced, there is reference to data sources in text, but table should make data source clear.	No	The references have been added to the **Table 11-7** caption (**ES chapter 11 Offshore Ornithology** (document reference 6.1.11)).
Natural England	Section 13.6.2.2.2.1 - Note that Band Option 2 used for all species recorded in flight to screen. No specific information or justification on lower limits used to screen out species at this stage. Define screening parameters. It may be more appropriate to use something other than CRM to screen species out.	No	The approach to screening is based on the assessment methodology described in **Section 11.6.2.2.2.3** in **ES Chapter 11 Offshore Ornithology** (document reference 6.1.11). Any species where the combined annual collision rate was greater than one was screened into further assessment. Some species which did not meet this threshold but are considered to possess high

			sensitivity to collision were also screened in.
Natural England	It is probably not useful to include birds that were absent from both sites. Remove absent birds.	No	Birds absent from both SEP and DEP have been removed from the table.
Natural England	Have used upper figure of the Natural England advice, which is to apply the following ranges of nocturnal activity levels in CRM: Gannet: 1-2 (equating to 0-25% nocturnal activity), Kittiwake: 2-3 (equating to 25-50% nocturnal activity), Large gulls (LBBG, herring gull, GBBG): 2-3 (equating to 25-50% nocturnal activity). This is an acceptable method as worst case is used, but please be aware that Natural England has advised other projects that it would be appropriate to calculate CRM for a range of nocturnal activity to present range of predicted impacts.	No	As well as the upper figure of Natural England's advice on nocturnal activity factors (**Table 11-10** of **ES Chapter 11 Offshore Ornithology** (document reference 6.1.11)), CRMs using evidence-based rates are presented for species for which they were available.
Natural England	Biometric parameters only presented in Appendix 13.1, in which the date presented in Table 13-3 is not referenced. Please state the origin of tern biometric and behaviour parameters and confirm sources of data in the appendix table by referencing.	No	The references have been added to the table in **ES Appendix 11.1 Offshore Ornithology Technical Report** (document reference 6.3.11.1)

Natural England	Table legend is unclear. Update table legend to clarify that figures presented are % of time operational.	No	The **Table 11-3** caption has been updated (**ES Chapter 11 Offshore Ornithology** (document reference 6.1.11).
Natural England	Natural England advise that CRM should be presented as monthly figures.	No	The CRM outputs are presented as monthly figures in the tables, with seasonal figures referred to in the accompanying text. Monthly figures for offshore ornithology receptors screened out of the assessment are presented in **Appendix 11.1 Offshore Ornithology Technical Report** (document reference 6.3.11.1)
Natural England	*"The lower, mean, and upper collision estimate for each scenario is presented, based on the results obtained from including the appropriate variation about mean values for density (95% lower and upper confidence intervals), flight height (95% lower and upper confidence intervals) and avoidance rate (two standard deviations). Presented within the same table are percentage increases in background mortality rates of seasonal and annual populations (Table 13-16)."* This is the correct approach but does not appear to be the case in the following tables, please amend if needed.	No	The CRM outputs are presented separately for each parameter variation in the tables, with comment on this provided in the text.
Natural England	Please provide this figure.	No	All figures are provided in **Appendix 11.1 Offshore**

			Ornithology Technical Report (document reference 6.3.11.1).
Natural England	*"…along with the total length of transects used in subsequent analysis."* These are the total transect lengths in the entire aerial survey area. Include the transect lengths and a clear figure that shows the transects for the SEP and DEP areas (with buffers indicated).	No	The transect design has been provided on **Figure 11.1** of **ES Chapter 11 Offshore Ornithology** (document reference 6.1.11). The approximate transect lengths and approximate percentage coverage achieved by the study design in each reporting region is presented in **Appendix 11.1 Offshore Ornithology Technical Report** (document reference 6.3.11.1). These figures are approximate as exact survey effort differed slightly between surveys due to minor differences in start and stop times for transects and minor deviations of the aircraft from the transect line.
Natural England	Where is the additional survey information presented/used? Please consider.	No	With regard to age classification, 92% of all birds were recorded as either "blank" or "unknown". The recorded age classes of gannet and kittiwake are used in the **RIAA** (document reference 5.4) to refine the breeding season apportioning predictions of breeding adults from the

			Flamborough and Filey Coast SPA. Due to concerns around the small numbers of birds assigned a sex or behaviour, unknown reliability of the observations made, and the unknown potential for biases in this information, sex and behavioural observations are not used by the assessment.
Natural England	Natural England have concerns over the reporting regions. Please clarify whether DEP North and DEP South are treated as independent reporting regions for the purpose of this analysis.	No	The DEP North and South array areas are treated as a combined reporting region in the design-based density estimates.
Natural England	Natural England note that we advised the use of published flight heights and Option 2, as the survey methodology (digital aerial surveying) did not include an adequate method to record flight heights. However, the review presented in para 26 and beyond, and our own analysis of this matter, suggests that in this instance (for Sandwich Terns breeding in the Greater Wash area) the published flight height distributions are underestimating the proportion of birds that fly at potential collision height. Natural England advise that we have contracted ECON ecology to re-analyse flight height data collected during the Sheringham Shoal post-consent monitoring (and presented in Harwood et al. 2018). This report is currently in final draft	No	The revised flight height distribution for Sandwich tern was received in September 2021, and along with Option 2 CRM, is used as a source of Sandwich tern flight height information by the assessment.

	stage and will be made available to the applicant within the next month. It is Natural England's opinion that this data set constitutes the best available evidence to inform CRM for Sandwich Tern in the Greater Wash. Unlike most data collected on flight height, this work has been validated via the use of range-finders and collected at a site adjacent to the project areas subject to current assessment. We will share this report with the applicant as soon as it is finalised.		
Natural England	*"The upper 95% confidence limit of the Johnston et al. (2014) and "Corrigendum" (2014) dataset overlaps with the percentage of birds recorded at PCH predicted by the SOW and DOW baseline surveys."* It only appears to overlap with the PCH predictions for SOW and with Triton Knoll.	No	The relevant text in **ES Appendix 11.1 Offshore Ornithology Technical Report** (document reference 6.3.11.1) has been amended.
Natural England	*"However, a possible explanation for the lower flight height estimates in the Johnston et al. (2014) and "Corrigendum" (2014) dataset is that these data are expected to contain large numbers of birds on passage, or dispersing from colonies outside the breeding season, and that Sandwich terns may tend to fly at lower heights during these times than they do during the breeding season (Perrow et al., 2017)."* This suggests that the Johnston et al. (2014) and "Corrigendum" (2014) data should be limited to use outside the breeding season.	No	This is a reasonable suggestion. The assessment has dealt with this by relying on the flight height distribution of Harwood (2021) in Sandwich tern CRM.

Natural England	*"These are lower levels of macro-avoidance incorporated into the 0.989 avoidance rate for this species."* What does this mean?	No	This text refers to the macro-avoidance incorporated into the currently recommended avoidance rate of 0.989. **ES Appendix 11.1 Offshore Ornithology Technical Report** (document reference 6.3.11.1) has been developed to explain this point with greater clarity.
Natural England	Natural England have concerns about gannet avoidance rate. Please see related points. Note that ORJIP collected no data on gannet collisions.	No	The gannet avoidance rate of 0.989 that is used throughout the assessment is that recommended by SNCB guidance (UK SNCBs, 2014).
Natural England	*"For gannet, a nocturnal activity value of 25% has been used in this assessment, although CRM outputs are also presented using the evidence-based value of 8%."* Please reference tables where these CRM outputs are presented.	No	CRM outputs for gannet using both nocturnal activity factors are presented in **Table 11-107** in **ES Chapter 11 Offshore Ornithology** (document reference 6.1.11).
Natural England	*"For kittiwakes and other gulls, nocturnal activity values of 50% have been used in the CRMs in this assessment, following the default values given in Band (2012). For kittiwake, a review and analysis of activity data from tracking studies (Furness et al. in prep.) has identified nocturnal activity rates for the breeding and non-breeding seasons, respectively, of 20% and 17% based on empirical evidence. Therefore, the 50% value used here is considered highly*	No	CRM outputs for kittiwake using both nocturnal activity factors are presented in **Table 11-110** in **ES Chapter 11 Offshore Ornithology** (document reference 6.1.11).

	precautionary. CRM outputs for kittiwake are also presented using the evidence-based value of 20%." Please reference tables where these CRM outputs are presented.		
Natural England	*"Other than differences in the categorisation of flight activity, the methodology employed was identical to the published work of Fijn and Gyimesi (2018)."* Please could this statement be explained? The categorisation of flight activity seems quite significant to rates presented.	No	Further detail on the differences has been added to **ES Appendix 11.1 Offshore Ornithology Technical Report** (document reference 6.3.11.1) to illustrate the differences in categorisation, along with a summary of the result of these changes on the outputs.
Natural England	Natural England have concerns about kittiwake and gannet apportioning. Natural England queries why age class data has not been used to refine this apportioning.	No	This step was omitted in error from the PEIR submission. It is now included.
Natural England	*"This equates to a latest total population size of 165,469, when calculated as individuals and multiplied up to include subadult birds, based on the adult proportion of 0.53 from Furness (2015)."* It is unclear as to why sub-adults are being accounted for here, when apportioning approaches calculate number of breeding adults. Please could this be clarified.	No	This calculation is not used in and does not influence the assessment. It has therefore been removed from the document.
Natural England	*"This equates to a latest total population size of 15,902, when calculated as individuals and multiplied up to include subadult birds, based on the adult proportion of 0.61 from Furness*	No	This calculation is not used in and does not influence the assessment. It has therefore been removed from the document.

	(2015)." Natural England query why is this calculation presented and how it has influenced the assessment.		
Natural England	*"As the population of Sandwich tern at the North Norfolk Coast SPA appears to have increased between 2008 and 2018 (JNCC, 2020), and appears to have been relatively stable since approximately 2013, the population estimate based on the 2018 count (breeding and non-breeding/sub-adult birds) has been used as a reference population."* Interpretation of population trends is, of course, greatly influenced by the time period over which the trend is assessed. For example, examination of the period, 2006 to 2016, would suggest that the population was more or less stable rather than increasing (and 2008 was a low point in the population numbers).	No	This is noted. Assessment of population trends at a range of temporal scales have been included in the **RIAA** (document reference 5.4), in order to try and present a balanced view of Sandwich tern population trends at the North Norfolk Coast SPA.
Natural England	*"Since 2015, the majority of Sandwich terns breeding in the North Norfolk Coast SPA have been located at Scolt Head, and not Blakeney Point (JNCC, 2020). The selection of a preferred breeding location is due to a number of reasons. These include the presence of black-headed (a positive factor for Sandwich tern colonisation) and large gulls (a negative factor for Sandwich tern colonisation) at the start of the breeding season, the presence of non-avian predators (e.g. foxes), and the state of vegetation."* Please provide references/evidence source.	No	These comments were taken from discussions held with Bureau Waardenburg, made with the benefit of several years of experience of tagging Sandwich terns at Scolt Head.

Natural England	*"Considering differential at-sea distributions due to colony switching"* Natural England welcome the review presented within this section and would welcome engagement on how this could be improved to better understand if impacts are likely to differ in years when Sandwich terns favour Blakeney Point over Scolt Head.	No	Discussion is included within **ES Chapter 11 Offshore Ornithology** (document reference 6.1.11).
Natural England	*"It is proposed to undertake investigations into the differences between the modelled population trend and observed trends at the North Norfolk Coast SPA as part of the final Environmental Statement (ES) submission, particularly with respect to how impacted scenarios might vary when applied to increasing, stable, or decreasing baseline scenarios."* We would welcome engagement as regards PVA scenarios, and the parameterisation of the models.	No	A PVA workshop was held in November 2021. A summary of the key points discussed is provided later in this table.
Natural England	MacArthur Green, 2020a - Headroom calculations - It is noted that these are presented, but not used for assessment. Natural England do not advise that the approach presented as a method for altering the collision figures of planned and consented projects. Our advice is that the CRM should be completely re-run for built and refined projects (assuming the developer in question has not already done so), using project-specific bird density data, in order to generate updated collision figures for a legally-secured built or refined project design. Please also see our advice above regarding the legal basis for headroom.	No	This advice is noted. In the absence of re-run CRM using as-built designs for many of the OWFs in question, these figures have been retained for comparison within the assessment. For the cumulative and in-combination collision risk assessment for Sandwich tern (**Section 11.7.3.2.5 ES Chapter**

			11 Offshore Ornithology (document reference 6.1.11)), three scenarios in addition to consented and as-built OWF designs have been considered. The first assumes that any unbuilt capacity at the consented OWFs is built out using turbines of the same specification as the consented design. The second assumes that any unbuilt capacity at the consented OWFs is built out using turbines of the same specification as those actually used at the OWF. The final set of CRM outputs is the same as the latter scenario, but with the assumption that the as-built layout of DOW is legally secured. Further details describing the mechanism for securing the as-built layout of DOW are provided in **ES Chapter 4 Project Description**. (document reference 6.1.4).

10 Commercial Fisheries

Consultee	Comment	Development change?	Response
Norfolk Country Council (NCC)	It is felt that where there is likely to be a demonstrable impact on commercial fishing affecting communities in Norfolk that Equinor should provide appropriate mitigation and compensation to those fishing communities affected.	No	The impact upon local commercial fishers has been assessed. Where justified, FLOWW guidance will be followed with respect to the identification of appropriate mitigation / disturbance payments.
Weybourne Parish Council	WPC has concerns about fishermen's livelihoods: the PEIR describes the impact as "minor adverse" for UK potters. However, on a local scale these impacts can be colossal.	No	The impact upon local commercial fishers has been assessed. Where justified, FLOWW guidance will be followed with respect to the identification of appropriate mitigation / disturbance payments.

NNDC	Commercial fishing in North Norfolk is a key part of the District's history, culture and economy. However, many commercial fisheries in the District operate on the margins of viability and existing and proposed wind farm related activities and associated restrictions/exclusion including surveying work can impact not only those fishing but those businesses that are dependent on local supplies from the fishing industry to process and sell to market including iconic produce such as Cromer crab. NNDC welcome the engagement already undertaken as set out in Table 14-2 of the PEIR chapter and would wish to see continued engagement with all relevant stakeholders as the project progresses.	No	Noted. Consultation undertaken to date is summarised within **Table 12-1** in **ES Chapter 12 Commercial Fisheries** (document reference 6.1.12) and **ES Appendix 12.1 Commercial Fisheries Technical Report** (document reference 6.3.12.1)
Cley-next-to-the-sea Parish Council	CPC has concerns about fishermen's livelihoods.	No	The impact upon local commercial fishers has been assessed within **ES Appendix 12.1 Commercial Fisheries Technical Report** (document reference 6.3.12.1). Where justified, Fisheries Liaison with Offshore Wind and Wet Renewables Group (FLOWW) guidance will be followed with respect to the identification of appropriate mitigation / disturbance payments.

NFFO	Reference is made to the application of a 500m safety zones for major maintenance. The introduction of service operation vehicles for use on some projects has led to applications for 500m safety zones applying to their activities. As these in practice are used for routine maintenance practices frequently docking to surface structures, they can under such provisions present a much more significant disruption to fishing activities within the vicinity of a site. It is requested that intentions with respect to such vessels and the use of safety zones are clarified and if it is considered an option, then the implications of such arrangements should be factored into the assessment."	No	Safety zones during the operational phase will not be applied to service operation vessel activities and will be for major maintenance only, with 10 jack-up vessel movements per site, per year anticipated requiring 500m safety zones during the operational phase (**ES Chapter 4 Project Description** (document reference 6.1.4)).
NFFO	It is noted that with the Cromer Shoal MCZ the intention is to surface lay the export cable. The assessment notes that it is expected that it is considered that fishermen would operate appropriately without defining what that means or defining assumptions for the purposes of the assessment. This is also complicated by the fact that a commitment has not been given over whether any surface laid, or shallow buried but exposed cable would be protected. Static fishing gears have the potential to snag an exposed unprotected cable and therefore this risk should be assessed.	No	Unprotected surface laid cable within the Cromer Shoal Chalk Beds MCZ has been scoped out of the PDE. Cables will be buried as far as possible to avoid the need for external cable protection systems. The **Outline CSCB MCZ CSIMP** (document reference 9.7) provides further information on the anticipated cable installation and protection requirements within the MCZ.

			The impact on snagging to static fishing gears has been considered in **Section 12.6.2.4** in **ES Chapter 12 Commercial Fisheries** (document reference 6.1.12), **ES Appendix 12.1 Commercial Fisheries Technical Report** (document reference 6.3.12.1) and **ES Chapter 13 Shipping and Navigation** (document reference 6.1.12).
NFFO	The cumulative assessment is predicated on the basis that fisheries will have access to the areas of all offshore windfarms project areas during the operational phase. However, there is as yet no firm evidence that in the case of trawling and beam trawling that fisheries are resuming within built out projects. In addition, Hornsea Project 3 appears to be missing from the cumulative assessment. Projects affecting some fleets in other North Sea state waters have not been included in the assessment.	No	Consultation and analysis conducted as part of the Commercial Fisheries Technical Report (**ES Appendix 12.1 Commercial Fisheries Technical Report** (document reference 6.3.12.1)) has identified that levels of trawling and beam trawling are limited within SEP and DEP, with 99% of all landed weight in the wind farm sites study area caught using pots and traps.

			Hornsea Project 3 has been incorporated into **Table 12-12** of the updated Commercial Fisheries Technical Report (**ES Appendix 12.1 Commercial Fisheries Technical Report** (document reference 6.3.12.1)).
NFFO	It is not clear in the cumulative impact assessment what assumptions have been applied with respect to loss of access to fishing grounds and displacement from marine protected areas. It is noted that the government has signaled changes in approach following Brexit that imply more onerous exclusions of bottom contacting mobile fishing gears, as indicated in the recent MMO consultation on offshore marine sites, including the Dogger Bank where it is proposed to exclude these gears from the entirety of the site. In addition, it is not clear whether MPAs or other spatial management impediments in other North Sea states that will affects some fleets have been included.	No	Use of mobile gear is already spatially restricted within the Cromer Shoal Chalk Beds MCZ. More onerous restrictions are anticipated for mobile gear and this has been considered (i.e. the assumed position within the cumulative impact assessment is that mobile gear is restricted from MPAs with benthic features). However, due to current lack of mobile activity across SEP and DEP, it is not expected that displacement will occur.

NFFO	It is difficult to draw a view on the validity of the cumulative impact assessment conclusions without a graphical representation of the projects against spatial fisheries data. The representation of VMS data in the report appears limited to 2017, although it is stated the assessment is based on, among other datasets, 2014-2017 UK VMS data. Nonetheless it is surprising that conclusions have been drawn of low sensitivity and magnitude of impact and minor adverse significance of effects on demersal trawl fisheries / none potting fisheries in terms of loss of access to fishing grounds and displacement effects resulting in gear conflict and increased pressures on alternative grounds. We anticipate that large scale displacement will result from the combined effects of multiple projects and other spatial management measures affecting fleets operating in the southern North Sea. Furthermore, these results are not consistent with, for example, the CIA for Norfolk Boreas that concluded moderate adverse impact significance for UK beam trawling (anglo-dutch and dutch seine netting and beam trawling to loss of access to fishing grounds and displacement effects and Hornsea 3 that concluded moderate impact significance for demersal trawls to loss of access to fishing grounds.	No	Existing demersal trawl fisheries / potting fishing activity in SEP and DEP is lower than in the Norfolk Boreas and Hornsea Project 3 areas, as shown in Figure 6.5 of Volume 2, Chapter 5 (Commercial Fisheries) of the Hornsea Project Three Offshore Wind Farm Environmental Statement (Ørsted, 2018) and Figure 6.9 of **ES Appendix 12.1 Commercial Fisheries Technical Report** (Commercial Fisheries Technical Report (document reference 6.3.12.1)) of the Norfolk Boreas Offshore Wind Farm Environmental Statement (Brown and May Marine Limited, 2019). This is the primary reason that impacts are assessed as minor adverse in relation to SEP and DEP.

			Additional VMS data for UK vessels for 2018 and 2019 has recently become available and has been incorporated into the assessment. VMS data from 2015 to 2017 has been retained to provide a 5-year timeline (**Section 12.4.2.1.2** in **ES Chapter 12 Commercial Fisheries** (document reference 6.1.12)).
NNIFA	The main pressure is outside vessels putting pressure on our grounds to get tract record.	No	The Commercial Fisheries Technical Report **ES Appendix 12.1 Commercial Fisheries Technical Report** (document reference 6.3.12.1) has been updated with VMS data for UK vessels for 2018 and 2019. VMS data for non-UK vessels is available up to 2017. It is recognised that the future baseline for commercial fisheries may be affected by changing fisheries activity patterns driven by a range of factors, including fisheries management (e.g. Total Allowable Catches (TACs), policy changes (e.g. UK exit from EU) and natural biological variations in species biomass.

EIFCA	Issues related to displacement of fishing activity: • What assessment of the possibility of displacement of fishing effort has been made? • Have fishermen been asked if there is place to displace to? This is especially important for small boat inshore fishers, who can't simply go further out. • In connection with the difficulty of finding alternative fishing grounds for some fishers, we suggest that the assessment "The potting fleets targeting whelk, crab and/or lobster within the DEP wind farm site are considered to be of medium vulnerability, medium recoverability and high value." (App. 14.1 Commercial Fisheries Technical Report, 5.7.1.1.1) may require re-appraisal – App. 14.1 Commercial Fisheries Table 5.1 identifies a sensitivity of "High" if condition "No alternative fishing grounds are available" is met, which may well be the case for inshore potters within the area affected by the proposed project. •The assumption that effort will be displaced, rather than removed, implies that it will be displaced to somewhere else. This will increase the effective fishing effort in that location. The impacts of that increased effort should be assessed as to effects on features of MPAs (if appropriate) and on fishers already operating in those areas. As this is a direct – and indeed seemingly intended – result of the required mitigation measure, it would seem to be the responsibility of the project developer to conduct this assessment.	No	It is agreed that the focus should be to mitigate the exclusion or reduced access in a way that does not lead to displacement i.e. mitigate so that fishing effort is removed, rather than displaced. This may be achieved through the requirement that gear moved due to construction activities is not subsequently used to fish elsewhere and instead goes into wet or dry storage. Further information is detailed within **Section 12.6.1.3** and **Section 12.6.2.3** of **ES Chapter 12 Commercial Fisheries** (document reference 6.1.12) and **Section 5.7.1.3.1** and **Section 5.7.1.3.2** of **ES Appendix 12.1 Commercial Fisheries Technical Report** (document reference 6.3.12.1)).

	• We advise that similar payments of compensation in the past have resulted in fishers using the money to purchase more fishing gear. This has increased the effective fishing effort. The impacts of that increased effort should be assessed as to effects on features of MPAs (if appropriate) and on fishers already operating in those areas. As this is a direct and predictable result of the required mitigation measure, it would seem to be the responsibility of the project developer to conduct this assessment. • Noting these points above, should not financial compensation be paid to remove fishing activity from those areas where this is needed for project works, rather than displace it elsewhere? As the issues arising from such compensation are direct and predictable results of the required mitigation measure, it would seem to be the responsibility of the project developer to ensure that compensation results in local and temporary elimination of fishing pressure, rather than displacement.		
EIFCA	We note the comment “Consultation has been key throughout the EIA process to determine extent and distribution of activity by the < 12 m fleet.” (App. 14.1 Commercial Fisheries Technical Report, 1.3.2) but were unable to find details of the consultation. Can you please direct us to the method and results of this consultation?	No	Consultation is presented within **Table 1-2** of the Commercial Fisheries Technical Report contained within **ES Appendix 12.1 Commercial Fisheries Technical Report** (document reference 6.3.12.1).

EIFCA	Issues relating to Cables & Electro- Magnetic Field (EMF) We think that the issue of potential effects from cables & EMF has been dismissed rather too lightly. This is especially the case for the cable route within the MCZ, where we note that "….. there is unprotected surface lay of cable (which is proposed as an option within the Cromer Shoal MCZ). …." (Chapter 12 Commercial Fisheries, section 327). Our concerns arise from three main points – 1. The potential danger to fishers posed by the snagging risk of surface laid cables interacting with fishing gear. We do not necessarily accept that this is a risk only for mobile gear, and suggest that there needs to be full consideration of the potential impacts of snagging surface laid cables for potting gear. 2. The EMF effects experienced by organisms within the sea diminishes with distance from the cable source of such EMFs. This is recognised within the PEIR by the proposal of cable burial as a mitigation measure, with statements such as "The Applicant is committed to burying offshore export cables where possible, reducing the effects of electromagnetic fields (EMF) .. Typical burial depth for DEP and SEP cables, .. is expected to be between 0.5m to 1.5m (or up to 1m for the export cables)" (Chapter 9 –Within Table 11-3: "Embedded Mitigation Measures"). When the cable is surface laid, the EMF effects have the potential to be much greater than would be the case for buried cables.	No	Unprotected surface laid cable within the Cromer Shoal Chalk Beds MCZ has been scoped out of the PDE. Cables will be buried as far as possible to avoid the need for external cable protection systems. The **Outline CSCB MCZ SIMP** (document reference 9.7) provides further information on the anticipated cable installation and protection requirements within the MCZ. The commercial impacts as a result of snagging are assessed within **Section 12.6** in **ES Chapter 12 Commercial Fisheries** (document reference 6.1.12) and **ES Appendix 12.1 Commercial Fisheries Technical Report** (document reference 6.3.12.1). The safety aspects including potential loss of life as a result of snagging risk are assessed within **ES Chapter 13 Shipping and Navigation** (document reference 6.1.13).

	3. We think that there may well be more uncertainty over effects arising from EMF than presented in the PEIR.		Potential EMF impacts are assessed within **ES Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9).

EIFCA	The PEIR notes that there may be displacement of shipping traffic due to the installation and operation of the wind farm and associated infrastructure. We could not find an assessment of the impacts from this displacement on fishing activity, and request that this information be supplied please.	No	**ES Chapter 13 Shipping and Navigation** (document reference 6.1.13) and the associated Navigation Risk Assessment (NRA) in **ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1) assess the impact of vessel traffic displacement. Six of the main 14 commercial routes are expected to be deviated, and it is anticipated, given natural features in the projects vicinity deviations will largely occur along pre-established routing options. The impact of the displacements was, therefore, assessed to be tolerable. The impact of displacement of shipping routes on fishing activity is further assessed within **Section 12.6.1.6** and **Section 12.6.2.6** and **Table 12-6** of **ES Chapter 12 Commercial Fisheries** (document reference 6.1.12) and **ES Appendix 12.1 Commercial Fisheries Technical Report** (document reference 6.3.12.1).

EIFCA	We consider it very important that developers open and maintain effective dialogue with all fishing interests who may be affected by a project (commercial fishers, recreational fishers and charter boat operators). We continually seek to improve how we respond to consultations, both in terms of efficiency and content. Therefore, if any of the points raised in this response are reflected in the outcome we would appreciate being informed.	No	Noted and understood. It is noted that impacts to recreational fishers are considered within **Chapter 16 Petroleum Industry and Other Marine Users** (document reference 6.1.16).

11 Shipping and Navigation

Consultee	Comment	Development change?	Response
Marine & Coastguard Agency (MCA)	We note in section 5.4 that an additional 14-day traffic survey (radar, AIS and visual) will be conducted post-PEIR in order to meet the required survey guidelines in MGN 654 (28-day).	No	In line with Marine Guidance Note (MGN) 654, the additional marine traffic data has been collected and included within the NRA (**ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1).
MCA	We note in sections 19.2.4 that consequence scoring will be completed post-PEIR and we also note under section 21 that “the hazard workshop has not yet been undertaken and that impacts will need to be agreed with stakeholder post PEIR but pre-ES submission”. We expect the NRA to be updated with the additional data	No	The Hazard Workshop discussions are summarised in (**Table 13-1** in **ES Chapter 13 Shipping and Navigation** (document reference 6.1.13)) and the Hazard Log is provided in the NRA (**ES Appendix 13.1**

	incorporated and MCA will provide further comments once completed.		**Navigation Risk Assessment** (document reference 6.3.13.1)).
MCA	We appreciate the early opportunity to comment on the draft MGN 543 checklist, and we can discuss the elements further as the project progresses. A new version of the checklist is available following the recent publication of MGN 654 which will need to be used for the NRA update. We are content at this stage with regards to the process you have undertaken in order to comply with MGN 654 and its annexes, and we welcome the work undertaken for addressing the guidance and recommendations so far.	No	The NRA is MGN 654 compliant. The MGN 654 checklist is contained within the NRA. (**ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1)).
MCA	The turbine layout design will require MCA agreement prior to construction to minimise the risks to surface vessels, including rescue boats, and Search and Rescue aircraft operating within the site. As such, MCA will seek to ensure all structures are aligned in straight rows and columns, including any platforms. Any additional navigation safety and/or Search and Rescue requirements, as per MGN 654 Annex 5, will be agreed at the approval stage.	No	Noted. The final layout will be agreed with MCA will comply with MGN 654 and the agreed layout commitments (**ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1)).
MCA	We are aware of a proposed seaweed farm west of the Sheringham Shoal wind farm site which we would expect to be assessed within the NRA update for potential impacts to traffic deviations.	No	The proposed seaweed farm is considered within the Cumulative Impact Assessment within **Section 13.7** and the NRA (**ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1)).

MCA	MGN 654 Annex 4 requires that hydrographic surveys should fulfil the requirements of the International Hydrographic Organisation (IHO) Order 1a standard, with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager. This information will need to be submitted, ideally at the EIA Report stage.	No	Noted
MCA	Export cable routes, cable burial protection index and cable protections are issues that are yet to be fully developed. However due cognisance needs to address cable burial and protection, particularly close to shore where impacts on navigable water depth may become significant. Any consented cable protection works must ensure existing and future safe navigation is not compromised. The MCA would accept a maximum of 5% reduction in surrounding depth referenced to Chart Datum. Where burial depths are not achieved consultation will need to take place with MCA regarding the locations, impact and potential risk mitigation measures.	No	Noted. Cables will comply with MGN 654 under-keel clearance requirements. Any changes exceeding 5% will be discussed with the MCA and TH.
MCA	Safety zones during the construction, maintenance and decommissioning phases are supported, however it should be noted that operational safety zones may have a maximum 50m radius from the individual turbines. A detailed justification would be required for a 50m operational safety zone, with significant evidence from the construction phase in addition to the baseline NRA required supporting the case.	No	Any safety zone applications will be accompanied by a detailed safety case. Operational safety zones, outside of those required during major maintenance are not anticipated.

MCA	An Emergency Response Cooperation Plan is required to meet the requirements of MGN 654 Annex 5 and will need to be in place prior to construction. The ERCoP is an active operational document and must remain current at all stages of the project including during construction, operations & maintenance and decommissioning. A SAR checklist will be discussed as the project progresses to track all requirements detailed in MGN 654 Annex 5.	No	An ERCoP will be produced detailing how the Project would cooperate and assist in the event of an incident. The requirement for an ERCoP is embedded in the project design (**Section 13.3.3** in **ES Chapter 13 Shipping and Navigation** (document reference 6.1.13)). The Applicant will comply with all requirements of MGN 654 including in relation to creation of an ERCoP.
Trinity House (TH)	Suggest that the Sustainable Seaweed Limited Norfolk proposed seaweed farm project should be assessed in the "In-Combination" section of the Navigation Risk Assessment.	No	The proposed seaweed farm is considered within the Cumulative Impact Assessment within **Section 13.7** in **ES Chapter 13 Shipping and Navigation** (document reference 6.1.13) and the NRA (**ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1)).
TH	TH would welcome earliest possible consultation regarding proposed layouts.	No	The final layout will be agreed with MCA and will comply with MGN 654 with due cognisance of TH marking and lighting requirements.
Chamber of Shipping (CoS)	Referenced and reiterated CoS response to TCE as part of the Round Three Extension consultation.	No	Impacts associated with loss of sea room are considered in **Section 13.6.2.2** in **ES Chapter**

	Sheringham Shoal: The Chamber does not have any specific navigational concerns at this stage given the insufficient information provided on layout or placement of potential turbines, however, would like to raise some concerns over the potential significant loss of sea room from proposed extension, particularly when viewed in combination with the proposed extension for Race Bank of which the boundaries overlap. Smaller vessels and vessels with shallow drafts would be particularly affected since they choose to separate their routeing from larger vessels thereby reducing any risk of collision. Accordingly, the reduction in sea room would likely force them to re-route onto tracks with larger vessels thereby increasing congestion and collision risk. The Chamber has concerns that a significant level of commercial traffic intersects with the eastern boundary and that an extension to the red line boundary would result in further constriction of that commercial traffic as vessels maintain what they consider a safe navigational distance from any turbines or navigational marks. Hence the Chamber recommends a boundary change. Dudgeon: The Chamber does not have any specific navigational concerns at this stage given the insufficient information provided on layout or placement of potential turbines however has serious navigational concerns over the suitability of western extent of the northern element to Dudgeon extension and the intersection with a high density route. Accordingly, the Chamber objects to the		**13 Shipping and Navigation** (document reference 6.1.13) and in the NRA (**ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1)). A collision risk assessment has been undertaken as part of the NRA (**ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1)) and impacts are assessed in **Section 13.6**. It is noted that smaller vessels with shallower drafts, such as recreational vessels, will be able to transit within SEP and DEP except where 500m safety zones are enforced during construction and major maintenance.

	full extent of the boundary due to the constriction of safe navigational sea room and does not consider the site suitable. With regard to the southern proposed extension, the area is used regularly by traffic travelling in a northwest-southeast direction and also traffic in a north south direction. Accordingly, this traffic would be required to deviate into alternative routeing, increasing the frequency of traffic in existing routes and risk should the extension be granted. The Chamber has specific concerns over the southwest corner with the highest density of commercial traffic and objects to the present boundary with a strong recommendation for a boundary change to prevent significant vessel channel constriction and loss of safe navigational sea room.		
CoS	Poorly planned proliferation of OWFs could become an existential threat to the safety of navigation for commercial shipping and the cumulative impact of OWFs in the UK EEZ is having a significant impact on the flexibility and efficiency of shipping routes.	No	Cumulative impacts are assessed in **Section 13.7** in **ES Chapter 13 Shipping and Navigation** (document reference 6.1.13)**.**
CoS	The Chamber notes with concern the strict interpretation of the width requirements as stated with MGN 543. The Chamber does not contend that the calculations used are incorrect when considering to the strict letter of the guidance, however, the Chamber asserts that the strict interpretation as outlined in 292 of 18.4 within the NRA is not in the spirit of safe navigation.	No	Impacts associated with loss of sea room are considered in **Section 13.6.2.2** in **ES Chapter 13 Shipping and Navigation** (document reference 6.1.13) and in the NRA (**ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1). The calculations, as stated, were undertaken in accordance with

			MGN 654 requirements. Additional text has been included to clarify the extent of sea room reduction.
CoS	The Chamber believes that for the long-term safe co-location of OWFs and commercial shipping, it is incorrect for developers to foresee the safe distance that mariners transit off OWFs as area for development, as this simply pushes further commercial vessels into ever closer passing's, increasing collision risk.	No	Impacts associated with loss of sea room are considered in **Section 13.6.2.2** in **ES Chapter 13 Shipping and Navigation** (document reference 6.1.13) and in the NRA (**ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1)). A collision risk assessment has been undertaken as part of the NRA (**ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1) and impacts are assessed in **Section 13.6**.
CoS	The Chamber, for purposes of Search and Rescue, along with navigational safety, wish to see at least one line of orientation maintained between the existing OWFs and the proposed developments. Furthermore, within the proposed DEP and SEP, the Chamber wishes to see two lines of orientation as set out within MGN 654 unless a sufficient safety case can be presented to the MCA.	No	Full consideration will be given to MGN 654 including SAR Annex 5 as the project progresses, in consultation with the MCA and TH.

CoS	The Chamber trusts that as MGN 654 has now been released following extensive consultation with industry that the developer will be making the proposal in full compliance with it at DCO.	No	The updated NRA has been undertaken in accordance with MGN 654 and includes an updated MGN 654 checklist. (**ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1)).
CoS	As the Chamber has found customary with such proposals, the documentation uses a dataset of Marine Accident Investigation Branch (MAIB) accidents for a ten-year period (2008-2017). The Chamber, having consulted with the MAIB and been informed that digital spatial data exists and is accessible for developers dating back to 1992. The Chamber considers that a single 10-year period to be an unnecessarily short period for accident data to be used and that it may not accurately reflect historic accidents and safety to navigation	No	The assessment has been updated to consider 20 years of MAIB data (**Section 13.5.3** in **ES Chapter 13 Shipping and Navigation** (document reference 6.1.13) and **ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1).
CoS	Recommendations that the wind farm site boundaries be reframed so as to provide more safe navigable sea room, or that commitments be made to the same effect. It must be recognised that through widening of the navigable channel between DEP and SEP, both allision risk and the “concentrated” collision risk will be reduced.	No	A worst-case approach has been taken to buildable area at NRA stage to ensure a safe and viable layout can be agreed. The final layout will be agreed with MCA and will comply with MGN 654 and the agreed layout principles in the NRA (**ES Appendix 13.1 Navigation Risk Assessment** (document

			reference 6.3.13.1) with due cognisance of TH marking and lighting requirements.
Essberger Tankers	The reduction of the navigable water clearance from 8Nm to 2Nm should not endanger the safety of navigation in a significant way and we are ready to accommodate this arrangement.	No	Noted. Impacts associated with loss of sea room are considered in **Section 13.6.2.2** in **ES Chapter 13 Shipping and Navigation** (document reference 6.1.13) and in the NRA (**ES Appendix 13.1 Navigation Risk Assessment** (document reference 6.3.13.1).
Independent Oil and Gas	Both the Blythe and Elgood assets are regularly serviced by supply and emergency response / standby vessels, therefore, careful coordination is required to ensure IOG can access the Blythe platform and the Elgood well 500m zone at all times. Periodic pipeline and seabed surveys are required outside of these safety zones and therefore, coordination is also required to ensure that these operations can continue unimpeded.	No	Access / proximity impacts associated with Oil and Gas are assessed within **ES Chapter 16 Petroleum Industry and Other Marine Users** (document reference 6.1.16).
North Norfolk District Council	NNDC would defer to the advice of the Maritime and Coastguard Agency, TH, Ministry of Defence (MOD) and other experts in respect of matters within this Chapter of the PEIR.	No	Noted.

12 Offshore Archaeology and Cultural Heritage

Consultee	Comment	Development change?	Response
Historic England	We wish to note that paragraph 2 of the introduction should also have referenced the published East Marine Plans as relevant to this proposed project, as detailed subsequently in paragraph 37.	No	Reference to the East Inshore and East Offshore Marine Plans has now been included in **Section 14.1** with detail provided in **Table 14-4** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).
Historic England	In paragraph 15 the following statement is made "The worst-case scenario for the disturbance of setting and character equates to the maximum intrusive effect (e.g. number and type of new infrastructure elements, height of infrastructure) for the longest duration." We consider it important that this assumption is examined further and redetermined in any ES produced: for 'character' as a component of seascape it is essential that consideration of "maximum intrusive effect" is reassessed in reference to concepts of capacity for a seascape to accommodate change as could occur due to DEP and/or SEP; and	No	Further narrative regarding the worst-case scenario for character as a component of seascape is provided in **Section 14.5.4**. Further narrative is also provided regarding heritage assets for which setting contributes to their significance in **Section 14.5**. Both above sections can be found in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).

	for consideration of 'setting' it is important to qualify heritage assets for which setting contributes to their significance whether such heritage assets are submerged, buried, exposed be it on the sea bed, within the intertidal area or adjacent coastal margin.		
Historic England	We also note that Maximum footprint of 56 WTGs is assumed to be the worst-case scenario without consideration of whether fewer, but larger WTGs may have more optimal location restrictions which could jeopardise more known or presently unknown heritage assets and places. The worst-case scenario for "Non-physical impacts to the setting of heritage assets and historic seascape character" (during impact period "operation") focusses on the maximum intrusive effect of up to 56 WTGs and 2 OSPs in consideration of installed infrastructure and operation and maintenance activities for the longest duration. It is our advice that such consideration requires referral to the capacity of spatially identified historic seascape character areas to accommodate change and there might not be a direct linear relationship that dictates number of WTGs as equating to a worst-case scenario. For example, do fewer, although physically larger, yet more dispersed WTGs represent characteristics, which corresponds with the legacy of other energy-related industrial infrastructure located in the southern North Sea?	Yes	Further narrative regarding the worst-case scenario for character as a component of seascape is provided in **Section 14.5.4** of the **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14). It is noted that the maximum number of turbines for SEP and DEP has been reduced from 56 to 53.
Historic England	Paragraph 23 states that "…there is no embedded mitigation relevant to the Offshore Archaeology and Cultural Heritage"	No	An additional explanation concerning the application of

	although other mitigation measures are proposed. We suggest that in any ES produced that an explanation is provided about how agreed avoidance for identified features of historic or archaeological may be considered as embedded mitigation. However, we note that Paragraph 24 states that an Outline archaeological Written Scheme of Investigation (WSI) setting out the method for all proposed mitigation will be prepared as part of the DCO application, but which was not included within this PEIR consultation exercise.		additional (as opposed to embedded) mitigation is provided in **Section 14.3.3** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14). The **Outline WSI (Offshore)** (document reference: 9.11) is submitted with the DCO application.
Historic England	Table 16-6 (Summary of acquired geophysical data) – summarises the acquired geophysics data. It is noted that the Side Scan Sonar (SSS) data was classed as being of 'variable' quality, which may impact the ability to identify smaller objects. It was concluded in Section 16.4.2.1 that the data was suitable for archaeological purposes (paragraph 45), but it should be noted that there is the potential for remains to be present that have not been identified or resolved through the geophysical survey campaign. We are aware that further detail is provided within Appendices 16.1 (Archaeological Assessment of Geophysical Data) and 16.2 (Addendum: Archaeological Geophysics), for which we have also provided comments.	No	Data gaps and the associated risks are highlighted in **Section 14.4.2.1** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14). The potential for further remains to be present, including smaller objects, will be addressed through the archaeological assessment of further geophysical data to be acquired post-consent. This commitment is captured in the **Outline WSI (Offshore)** (document reference: 9.11).
Historic England	We acknowledge the statement included in paragraph 47 that parts of the project area were not covered by the 2019/2020 surveys and we note the explanation provided about other	No	Data gaps and the associated risks are highlighted in **Section 14.4.2.1** in **ES Chapter 14**

	sources of data that were used. We also note the conclusion that those disparate data sets were of sufficient accuracy to characterise the archaeological potential of the proposed development areas. In terms of spatial currency of available data, we note the statement made in paragraph 109 regarding the identification of mobile sand waves. It is therefore an important matter that adequate attention is given to the risk of encountering presently unknown, buried archaeological materials in dynamic sea bed areas.		**Offshore Archaeology and Cultural Heritage** (document reference 6.1.14). The potential for further remains to be present, including smaller objects, will be addressed through the archaeological assessment of further geophysical data to be acquired post-consent. This commitment is captured in the **Outline WSI (Offshore)** (document reference: 9.11).
Historic England	Paragraph 54 includes a bullet point about "the perceived heritage importance of identified assets". However, importance is scaled, not perceived using defined criteria (e.g. national or international importance) and therefore this bullet point would need to be revised in any ES prepared for submission.	No	The impact assessment methodology has been updated to take account of recently published guidance on cultural heritage impact assessment and this bullet point has been removed from **Section 14.4.3** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).
Historic England	Paragraph 91 and Table 16.12 state that geotechnical investigations were not carried out to inform the EIA, although previous geoarchaeological assessments have been included in this PEIR. However, it would be helpful to know the spread of these cores across the proposed development areas and	No	Geotechnical investigations have been undertaken in Q4 2021, with geoarchaeological objectives included in the scope as set out in **ES Appendix 14.3 Stage 1 Geoarchaeological**

	whether gaps can be identified, which are spatially relevant to the Projects which should be the focus for attention. For example, where previous geophysical surveys and geotechnical investigations have identified several channel features thought to have formed during periods of low sea level when the area would have been exposed to a terrestrial landscape. We also consider it important that paragraph 97 acknowledges the significance of the Pleistocene and Holocene deposits of the coastal zone at Weybourne and the proximity of the Projects' study area to one of the most important stretches of coastline for Palaeolithic archaeology in the British Isles.		**Assessment of Geotechnical Data** (document reference 6.3.14.3). Further detail has also been provided regarding previously mapped palaeolandscape features identified from previous surveys with regard to Cumulative Impact Assessment in **Section 14.7.3** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).
Historic England	The use of available geophysical data to indicate the presence of sea bed features which are considered to be of archaeological interest or potential archaeological interest is noted (as categorised in Tables 16.15 and 16.16). It is also important to note the considerable number of anomalies which are given the identification code "A2" ("uncertain origin of possible archaeological interest") as explained in paragraphs 128-129, these anomalies will require examination in any Outline WSI prepared in support a DCO application.	No	The approach to investigating sea bed features in order to establish their archaeological interest (e.g. through the use of drop-down cameras or diver / Remotely Operated Vehicle (ROV) survey) is set out in the **Outline WSI (Offshore)** (document reference: 9.11).
Historic England	We must highlight the following matters for attention in any ES prepared: detail must be provided about how depth of HDD beneath the intertidal zone will be determined to avoid impact to sedimentary sequences of archaeological interest; and	No	The depth of sedimentary sequences of archaeological interest at the landfall, and the potential presence of Palaeolithic material within the shallow subtidal area, will be further

	attention must be given to the proposed exit below MLWS and the requirement for a “transition zone” as described in Chapter 5 and any risk of encountering archaeological materials in the shallow subtidal area especially given the research interest directed at discovering material in this zone over recent years e.g. Bynoe R. (2018) The submerged archaeology of the North Sea: Enhancing the Lower Palaeolithic record of northwest Europe”. Quaternary Science Reviews 191(2):1-14		clarified through the geoarchaeological assessment of geotechnical data acquired post-application/post-consent, and will inform the design of HDD and nearshore cable installation.
Historic England	We see that use was made of the consolidated national Historic Seascape Character (HSC) GIS dataset, as described in paragraph 153. However, while attention is given to the setting of identified subtidal wreck sites, there is no apparent attention to an assessment of change as could be introduced by the Projects. We request that such analysis is included in any ES produced.	No	An assessment of change to the historic seascape character is provided in **Section 14.5.4** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).
Historic England	In paragraph 169 we noted the determination of shipwreck associated with First and Second World Wars as “…heritage assets of medium importance.” It is important for us to explain that we do not necessarily differentiate between heritage assets. The definition of a heritage asset is that it has been positively identified as holding a degree of significance. Its significance is related to its heritage interest, which includes archaeological, architectural, artistic or historic factors, which of course, may change over time.	No	In accordance with the revised impact assessment methodology, the significance of heritage assets are described in **Sections 14.5.1.2**, **14.5.2.2** and **14.5.3.2** of **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).
Historic England	It is also stated that due to the use of HDD to install the cable ducts within the intertidal zone, that there will be no direct impact on archaeological material (paragraphs 179 & 181).	No	The depth of sedimentary sequences of archaeological interest, and the potential

	However, we noticed the very general reference to "…passing below the beach deposits…" it is therefore essential that all parties are clear that geo-archaeological evaluation studies are completed to a standard that can demonstrate if sedimentary sequences of particular archaeological interest, e.g. Cromer Forest bed Formation (CFbF) are present or not.		presence of Paleolithic material within the shallow subtidal area, will be further clarified through the geoarchaeological assessment of geotechnical data post-application/post-consent, and will inform the design of HDD and nearshore cable installation.
Historic England	To deliver micro-siting, further investigation of these [A2] anomalies would be required as part of high-resolution geophysical survey work which could be undertaken as part of the UXO investigations. It is therefore of critical importance that survey programmes that support planning and design of the Projects clarify the nature and extent of the anomalies. We therefore note the attention given to implementing procedures in accordance with an agreed archaeological WSI to optimise survey data acquisition, especially If features cannot be avoided to inform the additional work required to establish the archaeological interest of the features, using approaches such as ROV and/or diver surveys. Additional mitigation work may then be required (post-consent) which will be agreed with Historic England. In summary, we recommend that: n outline WSI accompanies the ES which sets out how archaeological advice will inform survey programmes conducted post-consent (should permission be obtained), but pre-commencement of any construction activities; and	No	The **Outline WSI (Offshore)** (document reference 9.11) is submitted with the DCO application. This sets out the approach to further investigation to inform micro-siting and provision of additional mitigation should avoidance not be possible. As secured within the **Draft DCO** (document reference 3.1), a final WSI (Offshore) will be produced post consent in accordance with the **Outline WSI (Offshore)** (document reference 9.11).

	draft) deemed Marine Licences provide for the preparation of WSIs to inform all phases of construction (should consent be obtained).		
Historic England	As you will appreciate it is not possible for us to concur at this stage if micro-siting is not possible that "…the residual magnitude and significance will be reduced or offset to levels considered non-significant in EIA terms…". This comment needs to be addressed by the applicant.	No	This statement has been amended (see **Paragraph 243** and **Paragraph 244** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).
Historic England	Paragraph 208 explains that "It is anticipated that HDD will pass beneath Quaternary deposits of potential archaeological interest…" In order to confirm such an assumption a detailed programme of geo-archaeological investigation will need to be provided for through agreed mitigation measures that accompany any DCO application.	No	Geotechnical investigations have been undertaken in Q4 2021, with geoarchaeological objectives included in the scope as set out in **ES Appendix 14.3 Stage 1 Geoarchaeological Assessment of Geotechnical Data** (document reference 6.3.14.3). A commitment to including archaeological objectives in planned surveys post-consent forms part of the proposed mitigation summarised in **Section 14.6** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).. The approach to post-application/post-consent

			geoarchaeological assessment is set out in the **Outline WSI (Offshore)** (document reference: 9.11).
Historic England	We recommend that any outline WSI produced in support of a DCO application, states that commissioned geo-archaeologists are given direct access to the cores rather than isolated deposits as this allows for greater reliability and confidence in the resulting conclusions. We also appreciate that a strategy will be developed to deal with unexpected discoveries, establishing a protocol for archaeological discoveries (paragraph 221) and are pleased to see that the protocol will be agreed in consultation with Historic England.	No	Direct access to cores is included as part of the approach to geoarchaeological assessment set out in the **Outline WSI (Offshore)** (document reference 9.11).
Historic England	It is acknowledged in Section 16.6.1.3 that the proposed development has the potential to impact local and regional hydrodynamic and sedimentary processes, which in turn could impact the historic environment by exposing them to marine processes (paragraph 228). Table 16-23 summarises the predicted effects based on the worst-case scenario, where it is concluded that the effects would be of a low or negligible magnitude. We would recommend that these conclusions are reassessed following the completion of the additional work (high-resolution geophysical work, geotechnical/geoarchaeological assessments etc.), as this will provide more information about the nature and extent of both the known and unknown archaeological remains present within the area of proposed works.	No	Should heritage assets vulnerable to changes associated with local and regional hydrodynamic and sedimentary processes be identified, following the completion of the additional work post-consent, these will be considered on a case by case basis and will be subject to archaeological monitoring in accordance with provisions set out in the **Outline WSI (Offshore)** (document reference 9.11).

Historic England	We note the summary narrative provided in Table 16.24 regarding the "assessed capacity to accommodate change" and the identification of "Potential beneficial change" i.e. society generally welcoming development of renewable energy infrastructure which should be objectively assessed in reference to published material e.g. Bugnot A.B. et al. (2020) Current and projected global extent of marine built structures. Nature sustainability (published online 31/08/2020).	No	The public benefit of SEP and DEP is considered in the **Planning Statement** (document reference 9.1).
Historic England	In reference to character sub-type "Palaeolandscape component" we note the assessed capacity is one of "Potential beneficial change" in connection to production of publicly available data to support analysis and interpretation. In respect to consideration of this exercise as narrative approach to identify different perspectives, we recommend the ES also considers this character sub-type as both known and potential resource and the implications of loss of access which could be permanent.		The known and potential palaeolandscape resource is described in **Section 14.5.1**. The maintenance of access within operational areas is discussed with respect to the character sub-type in **Section 14.5.4**. Both sections can be found within **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).
Historic England	In paragraph 293 the following statement is made: "However, as the extent of the potential heritage assets, prehistoric landscapes or historic seascapes which could be subject to cumulative impact are undefined, it is not possible to identify which plans, projects and activities would, or would not, have the potential to have a cumulative impact with the proposed projects."	No	The HSC geo-spatial data has been mapped against identified projects on **Figure 14.2** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).

	We consider this to be a matter that requires re-assessment within the ES, for example, in reference to the detail already provided in section 16.5.4 regarding the use of HSC geo-spatial data, “Impact 4” as described in Table 16-26 and the explanation provided in paragraph 294.		
Historic England	We concur with the assessment of the situation provided and it is relevant that impact assessment considers how access to the archaeological resource could be impacted across the North Sea, especially in reference to published professional research frameworks.	No	Noted.
Historic England	We are pleased to see that a monitoring plan will be prepared and submitted alongside the DCO (paragraph 312). We add that it would be helpful if DCO documentation e.g. In-Principle Monitoring Plan (IPMP) set out the timeframes for monitoring requirements to be conducted and reported.	No	The **Offshore In-Principle Monitoring Plan** (document reference 9.5) submitted with the DCO application describes the anticipated marine archaeological and cultural heritage monitoring requirements and associated timeframes.
Historic England	We also note confirmation of the use of a protocol system, as described in paragraph 321. In reference to Table 16.30 (summary of potential impacts) we reserve our position regarding the realisation of “residual impact” for construction, operation or decommissioning phases of either/or of the Projects in reference to the enactment of mitigation measures as a component of any statutory consent obtained for this proposed project.	No	Noted. The statement regarding residual impact has been amended (see **Paragraph 243** and **Paragraph 244** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).
Historic England	It is important to note that the line spacings used for the offshore geophysics surveys were larger than recommended	No	Data gaps and the associated risks are highlighted in **Section**

	for archaeological assessments in the Historic England document 'Marine Geophysics: Data Acquisition, Processing and Interpretation (2013).		**14.4.2.1** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).
Historic England	In addition, in Section 2.3.6, it is stated that initially, only 25% of SbP survey lines were assessed; additional lines were interpreted in order to more accurately map the extents of these features. It is therefore possible that smaller features may not have been identified following this work if they fell between the survey lines.	No	Data gaps and the associated risks are highlighted in **Section 14.4.2.1** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14). The approach to post-application/post-consent archaeological assessment is set out in the **Outline WSI (Offshore)** (document reference 9.11).
Historic England	We would therefore recommend that this document is referred to when planning future geophysics campaigns: [redacted].	No	Reference is made to the relevant Historic England guidance in planning future survey campaigns in the **Outline WSI (Offshore)** (document reference 9.11).
Historic England	An assessment of the quality of the information obtained from the geophysical survey work generally classed the data as being 'good' (criteria defined in Table 6). However, the Side Scan Sonar (SSS) nearshore data was classed as being of 'variable' quality as it was affected by weather noise. It was concluded that the SSS data could be used to identify larger	No	Data gaps and the associated risks are highlighted in **Section 14.4.2.1** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).

	objects, such as wrecks, but that it was more difficult to identify smaller objects.		
Historic England	It was also noted that the Magnetometry data obtained from the Projects areas was of 'average' quality due to the background noise in the data (Section 2.4.10). This coupled with the large line spacings of 75m meant that it was felt that smaller objects may not have been picked up in the data. This suggests that there is the potential for previously unknown features and remains to have been missed at this stage.	No	Data gaps and the associated risks are highlighted in **Section 14.4.2.1** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14).
Historic England	It is noted that due to the penetration of the Parametric Sonar data, the shallow nature of some of the features and the acoustic similarities between Unit 6b and the underlying Units 6a and 5, that it was not possible to accurately map the full extent of the features, particularly the Botney Cut features (Section 3.2.4). We recommend these areas should be targeted using additional techniques, such as boreholes to help characterise and understand the features and their associated features? It was stated that there was the possibility that the units associated with the Botney Cut had a more complex depositional history, which will need to be considered when developing research questions and the strategies used to investigate them (Section 3.2.12).	No	Geotechnical investigations have been undertaken in Q4 2021, with geoarchaeological objectives included in the scope as set out in **ES Appendix 14.3 Stage 1 Geoarchaeological Assessment of Geotechnical Data** (document reference 6.3.14.3)
Historic England	We note the attention given to archaeological discrimination viz. Tables 9 to 18 in reference to available data types. However, we are aware of data limitations and gaps in the information presented and that most anomalies have been	No	A strategy for addressing A2 anomalies is detailed in **Section 14.6.1.1.5** in **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document

	classified as “A2” (428 out of 470 anomalies in total), being of uncertain origin of possible archaeological interest. It was noted in Chapter 16 of the main PEIR document that AEZs will not be recommended for A2 anomalies. Therefore, a strategy would need to be developed in order to characterise and understand the nature of these anomalies if they cannot be avoided (Section 5.1.14), and to define whether they are of archaeological interest. If they are, a mitigation strategy would also need to be developed and detailed within the ES and documents such as the Outline Offshore Archaeological WSI.		reference 6.1.14). and set out in the **Outline WSI (Offshore)** (document reference 9.11).
Historic England	We agree with the recommendations made in Sections 5.1.3 and 5.1.4 that the archaeological contractor should be consulted to advice on potential samples that will be acquired for archaeological purposes. It is therefore important that the Outline archaeological WSI prepared for this proposed project explains how such matters will be addressed and delivered in consultation with local and national curators.	No	Geotechnical investigations have been undertaken in Q4 2021, with geoarchaeological objectives included in the scope as set out in **ES Appendix 14.3 Stage 1 Geoarchaeological Assessment of Geotechnical Data** (document reference 6.3.14.3). The approach to integrating archaeological objectives with future, planned geotechnical surveys is set out in the **Outline WSI (Offshore)** (document reference 9.11).
Historic England	The report did not include information about the line spacings used when the data was originally collected, and it was noted	No	It is acknowledged that there are gaps in the most recent survey

	that not all the additional areas have full geophysics coverage. In addition, the full suite of geophysics techniques was not used for some of the additional cable corridors (Section 2.4.3). It is therefore possible that additional previously unknown features of archaeological interest may be present in these areas (Section 2.4.5). This is a matter that we consider needs to be addressed.		coverage, although with the addition of historic datasets, the geophysical data assessment is considered to provide an accurate characterisation of the archaeological potential of the study area, appropriate for the purposes of EIA. Data gaps and the associated risks are highlighted in **Section 14.4.2.1** of **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14). The potential for further remains to be present will be addressed through the archaeological assessment of further geophysical data to be acquired post-consent. This commitment is captured in the **Outline WSI (Offshore)** (document reference 9.11).
Historic England	Similar issues noted in Appendix 16.2 regarding the penetration of the Parametric Sonar data, the shallow nature of some of the features and the acoustic similarities between Unit 6b and the underlying Units 6a and 5: it was stated that it was not possible to accurately map the full extent of the features, particularly the Botney Cut features (Section 3.2.15).	No	Geotechnical investigations have been undertaken in Q4 2021, with geoarchaeological objectives included in the scope as set out in **ES Appendix 14.3 Stage 1 Geoarchaeological Assessment of Geotechnical**

	Additional work would therefore be needed to clarify and characterise the nature of the events/features recorded in these areas.		**Data** (document reference 6.3.14.3).
Historic England	It was noted in Chapter 16 of the main PEIR document that AEZs will not be recommended for A2 anomalies. Therefore, a strategy will need to be developed to characterise and understand the nature of these anomalies if they cannot be avoided (Section 5.1.7), and whether they are of archaeological interest. If they are, a mitigation strategy will also need to be developed.	No	A strategy for addressing A2 anomalies is detailed in **Section 14.6.1.1.5** of **ES Chapter 14 Offshore Archaeology and Cultural Heritage** (document reference 6.1.14). and set out in the **Outline WSI (Offshore)** (document reference 9.11).

13 Aviation and Radar

Consultee	Comment	Development change?	Response
NATS	The operational Sheringham Shoal and Dudgeon Wind Farm array areas are located within the Greater Wash TMZ which was established to mitigate effect to aviation PSR.	No	An assessment of theoretical radar detectability of wind turbines and how detectability will impact NATS radar systems is provided in **Section 15.5.2.2** of **ES Chapter 15 Aviation and Radar** (document reference 6.1.15).
MOD	Both Projects will be detectable by the Trimingham ADR and will impact the operation of the air defence system. Mitigation will be required.	No	Impacts to the Trimingham ADR are assessed in **Section 15.6.2.2** of **ES Chapter 15 Aviation and Radar** (document reference 6.1.15).

MOD	The RAF Coningsby ATC PSR is also predicted to detect the operational wind turbines in both arrays however, the MOD assessment concludes that there will be no operational impact and, therefore, the MOD have no concerns for this radar and mitigation is not required. No impact will be created to military danger area or PEXA.	No	Noted.
MOD	The MOD will require that the array areas should be fitted with MOD accredited aviation safety lighting in accordance with the ANO. The MOD would need to confirm the specification of the lighting to be used.	No	Lighting of the Projects will be in accordance with the ANO and MOD requirements. Consideration of the fitment of aviation lighting is provided in **Table 15-3** of **ES Chapter 15 Aviation and Radar** (document reference 6.1.15).
MOD	Construction activity in the location of the Weybourne transmitter site will need to be compatible with technical safeguarding requirements.	No	Impacts to the Weybourne Transmitter site are considered at **Section 15.6.1.2** of **ES Chapter 15 Aviation and Radar** (document reference 6.1.15).
MCA	The MCA response focused on shipping and navigation elements of the PEIR however, the MCA will continue to engage with the Applicant from a SAR and navigation safety point of view.	No	The layout and SAR requirements will be agreed with the MCA and MMO post consent via the Deemed Marine Licence (DML) which would form part of the DCO.
IOG	IOG as operator of the Blyth offshore platform highlighted that helicopter approaches to the Blyth platform helideck continue in varying weather conditions.	No	A Helicopter Access Study with a focus on access to nearby oil and gas assets has been undertaken.

			The results are detailed within **ES Chapter 16 Petroleum Industry and Other Marine Users** (document reference 6.1.16) and **ES Appendix 16.2 Helicopter Access Study**. (document reference 6.3.16.2)
North Norfolk District Council (NNDC)	NNDC would defer to the advice of the MCA, MOD, NATS and other experts in respect of matters within this Chapter of the PEIR.	No	Noted.

14 Petroleum Industry and Other Marine Users Onshore

Consultee	Comment	Development change?	Response
Independent Oil and Gas (IOG)	The Blythe development includes a normally unmanned offshore production platform with a single production well drilled from the platform. A single subsea well will also be developed on the Elgood field, to the north-west of the Blythe installation, and will be tied back to the platform via a 9.1km 6" subsea gas flowline and umbilical. Gas export from the Blythe platform will be via a 24.5km 12" gas export pipeline that connects to the Thames (Southwark) 24" gas export pipeline to the south of the Dudgeon Extension Project (North). The developments remain on schedule, with the Blythe platform successfully installed in June 2021, and	No	Noted. Consideration has been given to both Blythe and Elgood within the assessment (**Section 16.5.1** and **Section 16.6** of **ES Chapter 16 Petroleum Industry and Other Marine Users** (document reference 6.1.16)).

	the Noble Hans Deul jack up rig currently on location at the Elgood gas field, drilling the 48/22c-7 well. First-gas from the Blythe and Elgood gas fields is anticipated late in Q3 2021.		
IOG	Line of sight communication is currently in place between the Blythe platform and the Bacton gas terminal. We would appreciate confirmation that this line of communication remains in place and unobstructed by any individual wind turbines of the Dudgeon Extension Project. IOG would be open to discussing alternative communication systems, such as the use of existing optical fibre, that may already be planned by Equinor for its own communication requirements.	No	Line of sight communications between the Blythe platform and Bacton gas terminal will be maintained and incorporated into the final layout design. The turbine layout will be finalised post-consent.
IOG	The appropriate crossing agreements will be required between IOG and Equinor should any of our asset infrastructure be crossed, for instance, inter-turbine (array) cables across gas export pipelines and umbilicals. Any activity undertaken within the Blythe platform 500m zone, the Elgood well 500m zone, or within the safety zones of the gas export pipelines, will also require an appropriate proximity agreement prior to works execution.	No	Noted. The Applicant will seek to secure crossing and proximity agreements with owners and operators of asset infrastructure where required prior to construction.
IOG	IOG is keen to support the United Kingdom (UK) Government's Net Zero emissions target, and undertake its activities in line with the Oil and Gas Authority (OGA) Strategy, so legislated for under the Petroleum Act 1998. IOG is keen to discuss how the presence of the Dudgeon Extension Project may provide an opportunity for asset electrification, via offshore substations (where present) or	No	The Applicant has currently not planned for external asset electrification but is willing to discuss and explore its feasibility and economics.

	direct from wind turbine. IOG would like to understand if the Dudgeon Extension Project will include such elements that do not preclude access to offshore wind energy that could support other offshore stakeholders in the future.		
North Norfolk District Council (NNDC)	NNDC would defer to the advice of the other experts in respect of matters within this Chapter of the PEIR particularly concerning existing infrastructure.	No	Noted. The Applicant has and continues to consult with the relevant operators of nearby assets with regards to impacts on existing infrastructure. This has included dedicated assessments of marine and helicopter access to the assets (**ES Appendix 16.1 Vessel Access Study** and **ES Appendix 16.2 Helicopter Access Study** (document references 6.3.16.1 and 6.3.16.2)).
Natural England (NE)	There is a potential clash with the timelines of DEP & SEP and Planned Blythe Hub surface and subsea infrastructure which is located near to the DEP Offshore Windfarm . Its pipeline will route directly north of DEP (S), stopping S of DEP (N). This raises the prospect of in-combination issues. Elgood is the first of five planned development wells in IOG's Phase 1 project and is expected to take approx. three months to drill and complete, after which the rig will move on to Blythe in early Q3. The production of 'first gas' is scheduled for Q3 2021. The assessment should consider the implications of a potential clash with construction and/or	No	The Applicant has consulted with IOG who advised that the Blythe platform was successfully installed in June 2021, and that the Noble Hans Deul jack up rig was on location at the Elgood gas field in June 2021. The projects remain on schedule with flow testing undertaken in Q3 2021. The earliest commencement of construction activities for SEP and DEP are not planned until 2025.

	O&M activities for the Blythe Hub and subsea infrastructure near DEP OWF.		Consideration has been given to the potential operational impacts to both Blythe and Elgood within the assessment (**Section 16.5.1** and **Section 16.6** of **ES Chapter 16 Petroleum Industry and Other Marine Users** (document reference 6.1.16) and within the access studies (**ES Appendix 16.1 Vessel Access Study** and **ES Appendix 16.2 Helicopter Access Study** (document references 6.3.16.1 and 6.3.16.2)).
NE	There is a concentration of pipelines to the east of DEP and SEP, linking southern North Sea gas fields to the Bacton Gas Terminal on the Norfolk Coast. The most easterly of these pipelines traverse the DEP South array area wind farm site. They are the Perenco operated Lancelot to Bacton gas export pipeline (PL876), the Bacton to Lancelot chemical pipeline (PL877) and the Shell operated Shearwater to Bacton gas pipeline (PL1570). The Durango to Waveney gas production pipeline, operated by Perenco, also traverses the DEP North array area wind farm site. Gas pipeline PL27, linking the Viking gas field in the east and the Threddlethorpe Gas Terminal on the Lincolnshire coast.	No	Noted. Consultation is ongoing with relevant O&G stakeholders. Gas pipelines PL876, PL877 and PL1570 have been considered within the CIA. Gas pipeline PL27 was approved for decommissioning in 2019. PL27 is out of use but remains in-situ. PL27 routes parallel to, and approximately 500m north of the

	The assessment should consider whether O&M activities will be needed for the pipelines which traverse the DEP sites and identify any potential in-combination effects.		northern boundary of the DEP North array area and is no longer in use and as such has been excluded from the CIA. It is also noted that a dedicated marine access study **(Appendix 16.1 Vessel Access Study** (document reference 6.3.16.1)) has been undertaken that includes consideration of pipelines within or near the wind farm sites.
NE	Volume 1 Chapter 17 Petroleum Industry and Other Marine Users Section 18.5.3 Point 46 Last sentence does not make sense	No	Noted. Sentence clarified.
NE	DEP and SEP overlap with an area identified as a High Potential Aggregate Resource (AGG3 zone). This area is covered by Policy AGG3 in the East Inshore and East Offshore Marine Plans (2014). The site is not a licensed aggregate extraction area itself. This will need to be considered in the ES.	No	Zone AGG3 has been identified in **Section 16.5.6** of **ES Chapter 16 Petroleum Industry and Other Marine Users** (document reference 6.1.16). It is noted that an Agreement for Lease (AfL) has been granted by The Crown Estate for SEP and DEP which takes precedence over any future potential aggregate extraction that may have occurred within the AfL areas. See also **Section 16.5.6** of

			ES Chapter 16 Petroleum Industry and Other Marine Users (document reference 6.1.16).
NE	PEIR Section 18.12 Table 18-15 (Construction, Operation and Decommissioning Phases) Impact 1 & Impact 3 are dependent upon Equinor reaching an agreement with operators as part of the embedded mitigation – residual impact to be confirmed for the former and is described as minor adverse for the latter. There is the potential risk that an agreement cannot be reached with the other operators. This should inform the worst case scenario.		Noted. **Table 16-16** of **ES Chapter 16 Petroleum Industry and Other Marine Users** (document reference 6.1.16) has been re-worded to clarify distinction between embedded and additional mitigation measures. Impact 3 pre-mitigation impact is minor. It is noted that marine and helicopter access studies **ES Appendix 16.1 Vessel Access Study** (document reference 6.3.16.1) and **ES Appendix 16.2 Helicopter Access Study** (document reference 6.3.16.2) have been undertaken to inform Impact 1, and that consultation is ongoing with the relevant operators.

Eastern Inshore Fisheries & Conservation Authority (EIFCA)	The Marine Management Organisation (MMO) document "Spatial trends in aquaculture potential in the South and East inshore and offshore marine plan areas" (2013) seems to identify locations within the area likely to be affected by the proposed project as offering potential for a range of aquaculture activities - lobster re-stocking (Fig 5), rope grown bivalve shellfish culture (Fig. 21), macro-algae culture production (Fig. 23) and marine finfish cage culture (Fig. 27). We could not find reference to examination of the potential interactions between the proposed project and features such as would support such aquaculture activities, and request that this be supplied.		A review of future trends including aquaculture potential is presented in **Section 16.5.11** of **ES Chapter 16 Petroleum Industry and Other Marine Users** (document reference 6.1.16).

15 Onshore Ground Conditions and Contamination

Consultee	Comment	Development Change?	Response
North Norfolk District Council (NNDC)	Chapter 18 - Onshore Ground Conditions and Contamination The contents of this chapter are noted. NNDC does not have any specific comments to make here other than the key factor is to ensure there is an appropriate strategy in place to deal with contamination should it arise and NNDC would want to see that an appropriate strategy can be secured within the DCO.	No	Potential impacts, and mitigation measures, associated with contamination, are discussed in **Sections 17.6** and **17.7** of **ES Chapter 17 Onshore Ground Conditions and Contamination** (document reference 6.1.17).
National Farmers Union (NFU)	Depths of Cables - The PEIR states that the minimum depth of the ducts would be 1.20m from top of duct to the surface. This minimum depth is essential to enable deep	No	Details of realistic worst-case scenarios (including burial depth of cables) is discussed in **Section**

	farming operations to take place, when necessary, for the growing of certain crops and interaction with land drains. We note it has been stated that the cables will be laid in accordance with National Grid UK Power Networks ECS 02-0019.		**17.3.2** of **ES Chapter 17 Onshore Ground Conditions and Contamination** (document reference 6.1.17). Impacts associated with farming operations are discussed in **ES Chapter 19 Land Use, Agriculture and Recreation** (document reference 6.1.19).

16 Water Resources and Flood Risk

Consultee	Comment	Development Change?	Response
Environment Agency	In general, it is unfortunate that the expert topic group for this subject did not meet further beyond the initial meeting of May 2020. Norfolk river catchments are internationally important and complex as is the aquifer that feeds many of them. The study would have benefited from further input from the consultee bodies.	No	The engagement with the expert topic group in May 2020 discussed the refinement of the scoping boundary down to the typically 200m wide PEIR boundary. Between then and the submission of PEIR for S42 consultation the project team were undertaking assessment work on that updated boundary. The initial assessment findings were then shared with stakeholders as part of Section 42 consultation. The Applicant recognises that the

			chalk river catchments through which the onshore infrastructure would pass are complex, sensitive and internationally complex systems. This was acknowledged in the PEIR, in the description of the baseline environment and in the definition of the value and sensitivity of surface and groundwater receptors.
Environment Agency	The rationale applied to assign a sensitivity measure each water body is not clear. Applying a minor or low impact because an affected waterbody makes up only a small percentage of the catchment is inappropriate as this does not recognise the interconnectivity of the network nor local importance. An example of this can be found at Table 20-21.	No	The approach presented in the PEIR was agreed at the ETG meeting in May 2020, each receptor has been assigned a sensitivity based on an assessment of the observed baseline characteristics of each receptor (e.g. for surface waters, their hydrology, geomorphology, water quality and related habitats are considered). A precautionary approach has been adopted, whereby the receptor is assigned the highest sensitivity based on available baseline data. Additional information with regards to how the definitions set out in Table 20.7 have been applied to each receptor in Table 20.13 can be

			provided in Section 20.5.5. Note that this approach has previously been agreed with the Environment Agency for other wind farm developments in Norfolk and Suffolk (e.g. the Norfolk Vanguard, Norfolk Boreas, East Anglia One North and East Anglia Two projects). The magnitude of effect on each receptor has been based on measurable characteristics such as the number of watercourse crossings or the proportion of the individual river catchment (as defined by the Environment Agency in their WFD water body outlines) affected by the proposed development, in order to provide a consistent approach across impacts. The percentages set out in Tables 20.18 and 20.19 to define impact magnitude are intended to refer to the proportion of these smaller river water body catchments rather than the much larger hydrological catchments also referred to in the same table.

			The Applicant believes that the relatively small size of the receptors and the way in which sensitivity is assigned adequately accounts for the local importance of receptors whilst recognising the inter-connected nature of the drainage network. Although we recognise that there are sub-catchment variations in the characteristics of each watercourse, we have sought to adopt a compromise between the resolution of the assessment and ensuring that the outputs are manageable and easily relatable to all stakeholder groups. The Environment Agency's own WFD river water body catchments were selected because they represent a readily available definition of catchments that have an established precedent for their definition.
Environment Agency	Similarly, at Table 20-28 the percentage rationale has been applied to groundwater bodies. Whilst it is true that impacts will not have a regional effect that matches the volume of the total groundwater body, effects can be very significant	No	The approach presented in the PEIR was agreed at the ETG meeting in May 2020, each groundwater receptor has been

	to local communities and areas. Magnitude of effect should recognise this.		assigned a sensitivity based on an assessment of the observed baseline characteristics (e.g. using WFD groundwater data 1and vulnerability mapping). A precautionary approach has been adopted, whereby the receptor is assigned the highest sensitivity based on available baseline data. The Applicant acknowledges that the groundwater receptors, as defined by WFD groundwater body outlines, each cover a large area. However, in this instance these units provide a higher resolution that freely available alternatives such as aquifer mapping (e.g., aquifer mapping indicates that the entire study area would fall within a single principal bedrock aquifer).
Environment Agency	The cumulative effects of other schemes requires more detailed consideration. Whilst cables and their ducts are largely inert their presence replaces existing natural systems which, when this occurs repeatedly can fundamentally alter them.	No	The cumulative effects assessment presented in **Section 18.7** of **ES Chapter 18 Water Resources and Flood Risk** (document reference 6.1.18) has been undertaken in accordance with the overall methodology used

			throughout the **ES**, and the level of detail presented reflects the information available at the time of writing.
Environment Agency	The proposed crossing of Spring Beck is an area of concern. The cable run appears to bisect an area of natural flood management which was finished in 2019. This area acts to hold water to help protect Weybourne from flooding downstream. The presence of the cable run will displace some of that storage capacity and may create other drainage routes. It is very important that this area is analysed further for any offsite increase in flood risk.	No	Spring Beck would be crossed using a trenchless technique and as such would not affect the operation of the natural flood management measures (understood to include scrapes, leaky dams and tree planting) employed between Spring Beck and Station Road. The trenchless crossings will be designed to avoid disturbing both Spring Beck and the natural flood management features on its floodplain. The impacts of construction and operation of SEP and DEP on surface and groundwater flows in the Spring Beck catchment are considered in **Section 18.6.1.4** and **Section 18.6.2.2** of **ES Chapter 18 Water Resources and Flood Risk** (document reference 6.1.18). The crossing of Spring Beck will not require any permanent above-

			ground infrastructure, and as such would not displace any surface water or increase flood risk. Subsurface cable infrastructure is not expected to significantly alter surface or subsurface flows or affect the way in which the natural flood management measures function.
Weybourne Parish Council	Spring Beck is a chalk stream, an internationally rare habitat. The EA has been carrying out work to improve the watercourse, and it now features Brown Trout, Otters and Kingfishers. Equinor has stated that it will cross Spring Beck using HDD, and it is critical that it sticks to this commitment.	No	The Applicant acknowledges this comment and reiterates the commitment to use trenchless technique to cross Spring Beck.
Weybourne Parish Council	There is concern about flooding and disruption to underground water (springs, aquifers etc), as has been the experience with previous wind farm works.	No	The Applicant acknowledges the comment and has provided further information in **ES Appendix 18.2 Flood Risk Assessment** (document reference 6.3.18.2).
National Farmers' Union	Private Water Supplies and Irrigation Systems: The NFU will expect to see specific wording agreed to cover any temporary or permanent impacts from construction on private water supplies and irrigation systems. Wording to be agreed and included in the Code of Construction.	No	The Applicant acknowledges the requirement to agree specific wording with regards to the prevention of impacts to private water supplies and irrigation systems with individual landowners. Wording of the final CoCP will be agreed through

			specific discussions with potentially affected parties.
Norfolk County Council	Flood and Drainage Issues and Comments The comments made in Norfolk County Council's response to the Environmental Impact Assessment Scoping Report in October 2019 remain valid and further detailed technical considerations are set out in Appendix 1.	No	The Applicant acknowledges the comment and has addressed Norfolk County Council's concerns in **ES Appendix 18.2 Flood Risk Assessment** (document reference 6.3.18.2).
Norfolk County Council	During construction Impact: 20.6.1.1.5 Where temporary dams are needed for the trenched crossings and/or temporary culverts for haul roads, again as per our Scoping Opinion response any works within these ordinary watercourses will require Land Drainage Consent from NCC (as LLFA or the relevant IDB if within their district). This includes all permanent and temporary works. We would recommend the applicant discusses these with LLFA before submission to streamline the process and whether the applications need to be supported by an ecology check i.e. disturbance to hedges and aquatic habitat. However, I note that they reference some mitigation measures in this section i.e. fish passage. Overall, there are no concerns with summary tables for this section. Impact 3 and 4: 20.6.1.3.5 / 20.6.1.4.5 - A Construction Surface Water Management Plan is recommended as a mitigation measure for the substation and all significant constructions compounds. There should be a CSWMP detailing how flood risk and pollution is dealt with during the	No	The Applicant acknowledges Norfolk County Council's concerns with regards to watercourse crossings and the flood risk from the substation and compounds. These have been discussed extensively at ETG meetings and further information has been provided in **ES Appendix 18.2 Flood Risk Assessment** (document reference 6.3.18.2). The Applicant also notes the requirement for Land Drainage Consent from NCC for the crossing of ordinary watercourses. These will be progressed in advance of construction.

	construction stages of all the infrastructure elements, especially the top three: Max Substation Footprint (construction area) = 7.25ha. Up to 2 main compounds of 60,000m2 each 3 secondary compounds of 2,500m2 each HDD compounds = 1,500m2 - 4,500m2 Overall, there are no concerns with summary tables for this section.		
Norfolk County Council	During operation: Impact 1: Supply of contaminants to surface and groundwater 20.6.2.1.5 mitigation should include reference to Phase 1 and Phase 2 Ground Investigation Reports especially if the operational drainage strategy focuses on utilising infiltration techniques to dispose of surface water. Agree that no mitigation is necessary for the onshore cable corridor but as above the temporary compounds during construction should consider surface water impacts. Overall, there no concerns with summary tables for this section.	No	A programme of Ground Investigation has been undertaken. Specific reference to the results of the investigation and the need for these reports to inform the drainage strategy has been included in the supporting **ES Appendix 18.1 Flood Risk Assessment** (document reference 6.3.18.1).
North Norfolk District Council	In respect of the impact of the project on water resources and flood risk within North Norfolk District Council jurisdiction, NNDC would defer to the expert advice of the Environment Agency in respect of the strategic overview of the management of all sources of flooding and coastal erosion, to the advice of Norfolk County Council Lead Local Flood Authority in respect of developing, maintaining and applying a strategy for local flood risk management in this area and for maintaining a register of flood risk assets. NNDC would also defer to the advice of Norfolk Rivers	No	The Applicant acknowledges this comment and confirms that further consultation with the Environment Agency and Norfolk Rivers IDB has been undertaken alongside Norfolk County Council.

	Internal Drainage Board who manage assets within/along/near the route of the proposed onshore cable corridor.		
South Norfolk Council and Broadland District Council	The Environmental Management Officer has looked at Noise and Vibration, Air Quality and Water and considered that there was one issue he should mention at this stage namely private water supplies. He considers it would be prudent to identify all private water supplies used for domestic and commercial purposes that could possibly be contaminated by construction and operational activities so that a risk assessment can be carried out including a description of any necessary mitigation.	No	The Applicant acknowledges the requirement to consider impacts to private water supplies (where residential properties have their own supplies from aquifers) and irrigation systems. Although these impacts are acknowledged in the PEIR assessment, there are no readily available data sets which define the location of all private water supplies in the onshore development area. In the absence of further information, the location of private water supplies, and the potential need for mitigation to ensure continuity of supply, will be identified through consultation with individual landowners during post-consent negotiations where applicable.
Water Management Alliance – Norfolk River	The Board has reviewed Volume 1 Chapter 20 – Water Resources and Flood Risk of the Dudgeon and Sheringham Shoal Offshore Wind Farm Extension PIER document (Royal HaskoningDHV, April 2021) and has the following comments to make.	No	The Applicant acknowledges that the proposed onshore development is located within the IDD of the Norfolk Rivers IDB. This is reflected in **Section 18.5.1**

Drainage Board	As mentioned in the chapter, the development is partially within the Internal Drainage District (IDD) of the Norfolk Rivers Internal Drainage Board (IDB) and wholly within the watershed catchment of the aforementioned. For an overview maps are available on the Board's webpages showing the IDD ([redacted]) as well as the wider watershed catchment ([redacted]).		of **ES Chapter 18 Water Resources and Flood Risk** (document reference 6.1.18).
Water Management Alliance – Norfolk River Drainage Board	The Board feels that it would be beneficial to include the following point which has been overlooked: Section 20.6.1.4.5 lists mitigation strategies for changes to surface water runoff from the construction phase of the proposed development. Part 144 states that additional surface water may be discharged to watercourses in consultation with the LLFA and EA. The Board would like it noted that within the Internal Drainage District, any discharges of surface water to a watercourse must be approved by the Internal Drainage Board as per our Byelaws (specifically Byelaw 3), thus consultation with ourselves will need to be included for some of these locations.	No	The Applicant notes the requirement for consent from Norfolk Rivers IDB for the crossing of or discharges into IDB-maintained ordinary watercourses. Following further discussion Protective Provisions for the IDB in Schedule 14 of the **Draft DCO** (document reference 3.1) to enable this process to be wrapped up within the DCO
Water Management Alliance – Norfolk River	While you may not deem it relevant to the PIER document specifically, after reading it I think it only prudent to mention now that as noted in section 20.5.6 of chapter 20, climate change is already causing wetter winters leading to the expectation of higher winter flows and	No	The Applicant notes the potential future requirement for enlarging arterial watercourses and will consider this when crossing solutions are developed for

Drainage Board	storm related flood events. It is likely that in the near future watercourse management may have to adapt to this by widening and deepening arterial watercourses (e.g. Board adopted watercourses) to create the additional capacity needed to contain this increase. This should be taken into account when placing the underground cable.		individual watercourses. Further engagement with the IDB will be undertaken post-consent to obtain their agreement for a suitable offset distance to ensure that their activities are not impinged by the presence of operational infrastructure.
Natural England	Given the recent HDD drilling mud breakouts experienced on a number of other OWFs, Natural England advises that a commitment to use best available techniques and a precautionary methodology be included, and that the worst-case scenario impacts of potential bentonite breakout are assessed. Given that the River Wensum SAC (and SSSI) are largely unfavourable recovering or unfavourable no change we would advise that any effects may constitute an adverse effect on integrity. We advise the Applicant to partner with Environment Agency on the River Wensum Partnership project. The Applicant needs to outline potential impacts of a drilling mud breakout either under, or in the floodplains of, the Wensum, and the potential effects on SAC and SSSI features that may be located up or downstream of the breakout. There is currently insufficient information provided in the documents provided on HDD tolerance monitoring, how quickly bentonite release can be stopped, or an assessment of a worst-case scenario bentonite breakout considering extent, timings, and environmental impacts. The Applicant needs to provide	No	The Applicant acknowledges the risk of bentonite breakout during the use of trenchless crossings to cross watercourses and associated floodplain wetland systems. A site-specific risk assessment will be undertaken as part of the post-consent detailed design process. This will consider the potential risks of using HDD or equivalent techniques and set out the procedures required to monitor construction activities and avoid breakouts. This will be agreed with the Environment Agency prior to commencement of construction activities.

	information on HDD tolerance monitoring, how quickly bentonite release can be stopped, or an assessment of a worst-case scenario bentonite breakout considering extent, timings, and environmental impacts. As with Norfolk Boreas, NE suggests that the Applicant partner with Environment Agency on the River Wensum Partnership project. In addition, the restoration of the HDD compound on the flood plain of the river Wensum should be restored in accordance with the River Wensum Restoration Strategy and the River Wensum SAC conservation objectives		
The Wildlife Trusts and Norfolk Wildlife Trust	River crossings (para 113)–we note the proposal to HDD under all main river crossings in order to avoid impacts on the rivers, at a depth that is predicted to avoid any impacts on the river bed and to avoid any accidental release of materials such as bentonite into the river channel. We recommend that the assessment includes an evaluation of the potential impacts of HDD on any features such as springs or other underground flows that may, if interrupted, impact on the river, for example where the proposed corridor is adjacent to the source and headwaters of the River Glaven.	No	The Applicant acknowledges the risk of bentonite breakout during the use of trenchless crossings to cross watercourses and associated floodplain wetland systems and this is considered in **Section 18.6.1.3** of **ES Chapter 18 Water Resources and Flood Risk** (document reference 6.1.18) A site-specific risk assessment will be undertaken as part of the post-DCO consent detailed design process. This will consider the potential risks of using HDD or equivalent techniques and set out the procedures required to monitor construction activities and avoid breakouts. This will be agreed with the Environment

			Agency prior to commencement of construction activities.
The Wildlife Trusts and Norfolk Wildlife Trust	River Wensum SAC (para 167)–we note the HDD is proposed to completely avoid impacts on the SAC, but we seek clarification on any potential impacts from siting the temporary compounds nearby. The SAC is flanked by floodplain wetland CWSs which are functionally linked to the health of the SAC and so indirect impacts on the SAC are possible if there are any impacts on the adjacent CWSs.	No	The Applicant acknowledges that the floodplain wetlands adjacent to the River Wensum SAC are functionally linked. This is discussed in **Section 18.6.1.1** with mitigation measures discussed in **Section 18.6.1.1.5** of **ES Chapter 18 Water Resources and Flood Risk** (document reference 6.1.18). HDD will be used to cross the functional floodplain as far as is practicable to minimise impacts. Furthermore, construction compounds will be sited outside of the floodplain if possible.
Cley Next the Sea Parish Council	Spring Beck is a chalk stream, an internationally rare habitat and itis critical that Spring Beck is crossed using HDD.	No	The Applicant acknowledges this comment and reiterates its previous commitment on the use of a trenchless technique to cross Spring Beck.

17 Land Use, Agriculture and Recreation

Consultee	Comment	Development Change?	Response
Forestry Commission	Your interactive map indicates that east of the A11 road the corridor of the proposed cabling passes through two woodland shelter belts and three woodlands, namely: • The two woodland shelter belts to the south of and attached to School Wood at grid references TG 1588 0279 and TG 1613 0286; • The Oval at TG 1701 0328, Norwich Hill at TG 1721 0334; • The west end of Furze Meadow woodland at TG 1721 0334 The Forestry Commission advocates that wherever possible cabling is tunneled under woodland shelter belts without the need for excavating an open trench, which greatly disturbs a woodland and the essential root mass. This is especially the case for Norwich Hill woodland. It is hoped that the cabling at that point can avoid the woodland completely by being routed south of Norwich Hill woodland and 50 metres from the perimeter of the woodland to avoid root disturbance.	No	The Applicant has committed to cross woodland habitat using trenchless crossing techniques.

HSE	According to HSE's records parts of the proposed DCO boundary area is within the consultation zones of major accident hazard site or pipelines. HSE would not advise against the onshore corridor or substations as these will have no permanent populations associated with them. Currently HSE cannot give advice on the four proposed locations for the construction compounds as not enough information has been provided. HSE requires the illustrations of the proposed boundaries and details of the populations e.g. numbers of people and where they would be located e.g. mess rooms; numbers of storeys in buildings is also required. Please note HSE cannot give its full advice until this information is provided. The above information is based on the illustrations from Virtual Exhibition for 'on-shore cable corridor', onshore substation and construction compounds	No	The Applicant notes that part of the DCO order limit falls within the consultation zone of major accident hazard site of pipelines. The Applicant is seeking crossing agreements with National Grid where any National Grid asset is to be crossed. HSE will be provided with the required information in order to give full advice.
National Grid	National Grid infrastructure within / in close proximity to the order boundary. Electricity Transmission: National Grid Electricity Transmission has high voltage electricity overhead transmission lines and a high voltage substation cables within the onshore scoping area. The	No	Noted. These assets have been taken into account in the site selection process for the SEP and DEP onshore substation. Protection of National Grid's existing assets will form part of the ongoing development of the

	overhead lines and substation form an essential part of the electricity transmission network in England and Wales. Substation: Norwich Main Substation Overhead Lines: • 4VV 400kV Norwich Main to Walpole 1 and 2 • 4YM 400kV Bramford to Norwich Main 1 and 2 • PGG 132kV Norwich Main to Norwich Trowse 3 • PHC 132kV Norwich Main to Norwich Trowse 1		substation design and associated landscaping proposals. SEP and DEP would undertake all utility crossings in accordance with industry standard practice as agreed with the utility providers. Furthermore, the DCO will include protective provisions in favour of the utilities providers to provide protection for their assets.
National Grid	National Grid Gas has high pressure gas transmission pipelines located within or in close proximity to the proposed order limits. The transmission pipelines form an essential part of the gas transmission network in England, Wales and Scotland: • Feeder 4 – Suffield to Little Barningham • Feeder 27 – Bacton Terminal to Kings Lynn Tee • Feeder 2 – Erpingham to Guestwick • Feeder 3 – Felthorpe to Hardingham	No	Noted. These assets have been taken into account in the site selection process for the SEP and DEP. SEP and DEP would undertake all utility crossings in accordance with industry standard practice as agreed with the utility providers. Furthermore, the DCO will include protective provisions in favour of the utilities providers to provide protection for their assets.

National Grid	The following points should be taken into consideration. Electricity Infrastructure: • National Grid's Overhead Line is protected by a Deed of Easement/Wayleave Agreement which provides full right of access to retain, maintain, repair and inspect our asset. • Statutory electrical safety clearances must be maintained at all times. Any proposed buildings must not be closer than 5.3m to the lowest conductor. National Grid recommends that no permanent structures are built directly beneath overhead lines. These distances are set out in EN 43 – 8 Technical Specification for "overhead line clearances Issue 3 (2004). • If any changes in ground levels are proposed either beneath or in close proximity to our existing overhead lines then this would serve to reduce the safety clearances for such overhead lines. Safe clearances for existing overhead lines must be maintained in all circumstances. • The relevant guidance in relation to working safely near to existing overhead lines is contained within the Health and Safety Executive's Guidance Note GS 6 "Avoidance of Danger from Overhead Electric Lines"	No	Protection of National Grid's existing assets will form part of the ongoing development of the substation design and associated landscaping proposal. SEP and DEP would undertake all utility crossings in accordance with industry standard practice as agreed with the utility providers. Furthermore, the DCO will include protective provisions in favour of the utilities providers to provide protection for their assets.

	and all relevant site staff should make sure that they are both aware of and understand this guidance. • Plant, machinery, equipment, buildings or scaffolding should not encroach within 5.3 metres of any of our high voltage conductors when those conductors are under their worse conditions of maximum “sag” and “swing” and overhead line profile (maximum “sag” and “swing”) drawings should be obtained using the contact details above. • If a landscaping scheme is proposed as part of the proposal, we request that only slow and low growing species of trees and shrubs are planted beneath and adjacent to the existing overhead line to reduce the risk of growth to a height which compromises statutory safety clearances. • Drilling or excavation works should not be undertaken if they have the potential to disturb or adversely affect the foundations or “pillars of support” of any existing tower. These foundations always extend beyond the base area of the existing tower and foundation (“pillar of support”) drawings can be obtained using the contact details above. • National Grid Electricity Transmission high voltage underground cables are protected by a Deed of Grant; Easement; Wayleave Agreement or the provisions of		

	the New Roads and Street Works Act. These provisions provide National Grid full right of access to retain, maintain, repair and inspect our assets. Hence we require that no permanent / temporary structures are to be built over our cables or within the easement strip. Any such proposals should be discussed and agreed with National Grid prior to any works taking place. • Ground levels above our cables must not be altered in any way. Any alterations to the depth of our cables will subsequently alter the rating of the circuit and can compromise the reliability, efficiency and safety of our electricity network and requires consultation with National Grid prior to any such changes in both level and construction being implemented.		

	General Notes on Pipeline Safety: • You should be aware of the Health and Safety Executives guidance document HS(G) 47 "Avoiding Danger from Underground Services", and National Grid's specification for Safe Working in the Vicinity of National Grid High Pressure gas pipelines and associated installations - requirements for third parties T/SP/SSW22. • National Grid will also need to ensure that our pipelines access is maintained during and after construction. • Our pipelines are normally buried to a depth cover of 1.1 metres however; actual depth and position must be confirmed on site by trial hole investigation under the supervision of a National Grid representative. Ground cover above our pipelines should not be reduced or increased. • If any excavations are planned within 3 metres of National Grid High Pressure Pipeline or, within 10 metres of an AGI (Above Ground Installation), or if any embankment or dredging works are proposed then the actual position and depth of the pipeline must be established on site in the presence of a National Grid representative. A safe working method agreed prior to any work taking place in order to minimise the risk of	No	SEP and DEP would undertake all utility crossings in accordance with industry standard practice as agreed with the utility providers. Furthermore, the DCO will include protective provisions in favour of the utilities providers to provide protection for their assets.

	damage and ensure the final depth of cover does not affect the integrity of the pipeline. • Excavation works may take place unsupervised no closer than 3 metres from the pipeline once the actual depth and position has been confirmed on site under the supervision of a National Grid representative. Similarly, excavation with hand held power tools is not permitted within 1.5 metres from our apparatus and the work is undertaken with NG supervision and guidance.		

Network Rail	The proposed project requires an underground cable to cross Network Rail's operational infrastructure (Breckland Line) located towards the south/south west of Norwich. The proposed Onshore Substation Site Options which form part of the project are located in close proximity to Network Rail's operational infrastructure (Great Eastern Main Line). The Applicant will need to consider the potential impact of construction traffic on level crossings which are situated in proximity to the site. For instance, Swainsthorpe (Public Highway Automatic Half Barriers crossing) is situated on Church Road to the south of the potential Onshore Substations. The Applicant will need to engage with Network Rail in relation to these aspects of the project. An Asset Protection Agreement is required to be signed before proceeding with any design or construction work alongside, above or below Network Rail's infrastructure. Prior to any development / construction or alterations to the site by the Applicant, further site specific safety requirements, engineering technical approval and detailed conditions will need to be sought from Network Rail's Anglia Asset Protection team. Network Rail have standard protective provisions which will need to be included in the DCO as a minimum In addition, a number of legal and commercial agreements will need to be entered into, for example, method statements, connection	No	The Applicant has identified all the road links required for construction traffic and a detailed assessment is provided in **ES Chapter 24 Traffic and Transport** (Document reference 6.1.24) and the **Outline Construction Traffic Management Plan** (document reference 9.16). SEP and DEP would undertake all crossings of Network Rail infrastructure in accordance with industry standard practice, and as agreed with Network Rail. Furthermore, the DCO will include protective provisions in favour of Network Rail to provide protection for their assets.

	agreements, property agreements and all other relevant legal and commercial agreements.		

NFU	The NFU understands that the route corridor is presently 200m wide and will be refined to 60m to 100m for where trenchless crossing is required. The NFU requests that it does hold face to face meetings with landowners affected by the proposed 200m route corridor so that it understands what features are on the ground including agricultural buildings, boreholes / reservoirs which supply irrigation systems, main access points to land etc which could be avoided by the final route. Equinor should not only rely on the information it receives to this consultation. It is stated at table 21.3 in Chapter 21: Agriculture that land take has been minimised where possible, reducing sterile land parcels, aligning with field boundaries, and avoiding the best and most versatile land. The NFU believes that for this to be achieved Equinor need to carry out more engagement with landowners and occupiers.	No	The Applicant has contacted all landowners affected by the proposal and has sought to have face to face meetings with all affected landowners. The site selection exercise has been informed by landowner feedback with regards to the positioning of the cable corridor across individual land parcels.
NFU	The Anglian Water Project which is running through East Anglia has not been mentioned and this will also be crossed by the SEP and DEP project. The NFU believes that the cumulative impact of the SEP and DEP scheme crossing other major linear underground cables and a water pipeline has not been addressed. The impact of crossing points on agricultural land and businesses must be addressed.	No	The Anglian Water Project is now included within the assessment. Cumulative effects with other utilities are considered in **Section 19.8** of **ES Chapter 19 Land Use, Agriculture and Recreation** (document reference 6.1.19).
NFU	NFU will be looking for specific wording to be agreed to cover reinstatement and aftercare of soils, working in wet conditions, how top and sub soil is stored, and the carrying out of a detailed pre -construction soil survey to form part of	No	Mitigation measures for soil resources relating to construction activities are outlined in **Section 19.7.1** of **ES Chapter 19 Land Use, Agriculture and Recreation**

	a detailed record of condition. The NFU will want to see this wording agreed in the Code of Construction."		(document reference 6.1.19). These are also set out in the **Outline Code of Construction Practice** (document reference 9.17).
NFU	There is concern over heat dissipation from cables as warmer soils have now been seen out on the ground. It has been stated that cement bound sand (CBS) will be required to encase the ducting and this is commonly used to ensure that the thermal conductivity of the material around the cables is of a known consistent value for the length of the installation. Further it is stated that CBS has a low thermal resistance to conduct the heat produced during electricity transmission away from the high voltage cables. It is not stated how much warmer Equinor expect the soil to be around the cables?	No	Modelling indicates that that top soil temperature will not be significantly impacted. Ground temperature directly on top of each circuit remains at the assumed summer temperature of 15°C. At 0.3m depth the soil will see a maximum temperature of 20°C, assuming an ambient temperature of 15°C. Further details can be found in **Section 19.7.2.6** of **ES Chapter 19 Land Use, Agriculture and Recreation** (document reference 6.1.19).
NFU	The NFU is pleased to see that Equinor have stated they will appoint an Agricultural Liaison Officer (ALO), the NFU will want to see specific roles being carried out by the ALO. The NFU will provide details of the roles to Equinor and would like to see this wording agreed to be incorporated in the Code of Construction.	No	An ALO would be employed to ensure that information on existing land conditions is obtained, recorded and verified during these surveys. These role requirements are set out within the **Outline Code of Construction Practice** (document reference 9.17).

Norfolk County Council	Members enquired if there is potential opportunity to use the cable corridor as a cycle path?	No	The majority of the land would be returned to its former use following the installation of the cable corridor and there are no plans to repurpose the land into a cycle path.
Norfolk County Council	The Mineral Planning Authority considers that the Preliminary Environmental Impact Report for the DEP/SEP correctly assesses the magnitude, sensitivity and significance of the effect of the projects on Mineral Safeguarding Areas within section 19.6.1.4. The further mitigation suggested in section 19.6.1.4.5 is considered likely to be effective.	No	The applicant acknowledges the comments from the County Council.

North Norfolk District Council (NNDC)	Tourism and recreation impact concerns were raised by NNDC in the examination of Ørsted Hornsea Project Three and developed further during the examination of Norfolk Vanguard and Norfolk Boreas. NNDC raised concerns about the Actual Tourism Impact of Negative Perceptions associated with the individual and cumulative impact of windfarm cable route works in North Norfolk. This is likely to be the case also with the SEP and DEP projects which could be taking place within the same timeframe as these other NSIP schemes. The tourism and leisure sector is incredibly fragile from the impacts of Covid-19 and it is important that growth and recovery of this sector in North Norfolk is not adversely affected by windfarm construction activities. Whether it forms part of Requirements/Conditions within the DCO or forming matters to be agreed outside of the DCO process, NNDC would wish to work with Equinor and other wind farm operators to ensure that the construction impacts of the development (both individually and cumulatively) on the tourism and leisure sector are carefully managed as it would be neither fair or reasonable that those businesses should be adversely affected as a result of wind farm projects without some form of mitigation strategy being in place."	No	Impacts to the tourism sector are considered in **ES Chapter 27 Socio-Economics and Tourism** (document reference 6.1.27)

Swardeston Parish Council	The PEIR states that significant effects during the construction, operation and decommissioning phases of the onshore substation sites have been identified on the users of a group of Public Rights of Way (PRoW), a permissive bridleway and Gowthorpe Lane that surround the fields in which the onshore substation sites lie. Effects would be at most of major significance and adverse. Chapter 21.7.3.7 identifies obstruction of PRoW Swardeston BR12, Stoke Holy Cross BR3 and Swardeston BR9 in the vicinity of the onshore substation. Para 270 suggests mitigation by way of “soft management” or provision of alternative routes and suggests any impact would be short term and temporary. Para 271 suggests these cumulative residual impacts are minor adverse. Given that SEP and DEP could sequentially impact these paths for up to 8 years and Hornsea Project 3 impacts the same paths with its cable route, the major disruption of a network of well-used paths is unacceptable given that it is impossible to simply take two paths in isolation without considering the whole adjoining local PRoW network. Whatever is meant by “soft management” has to guarantee that these paths remain safely open for the majority of the construction period with no more than the occasional closure or diversion for a short period."	No	Impacts to the existing network of footpaths is addressed in **Section 20.6.1.10** of **ES Chapter 19 Land Use, Agriculture and Recreation** (document reference 6.1.19). as well as **ES Appendix 19.1 Public Right of Way and Cycle Route Crossings** (document reference 6.3.19.1). There would be no permanent closures of any recreational routes. Any disruption to any recreational routes would be managed to ensure continued safe access for members of the public, and all efforts would be made to minimise the duration of any temporary diversions.
Weybourne Parish Council	Outside the key tourist season, the beach and coast path are still heavily used by walkers, birdwatchers and anglers, and these bring in vital revenue to local businesses in the low season.	No	Impacts to the beach and Norfolk Coast Path during construction and associated mitigation measures are considered in **Sections 19.7.1.7** and **19.7.1.9** of

			ES Chapter 19 Land Use, Agriculture and Recreation (document reference 6.1.19). The applicant notes the potential adverse effects on local tourism. Impacts to tourism are considered in **ES Chapter 27 Socio-Economics and Tourism** (document reference 6.1.28).
Weybourne Parish Council	The landowners in the Weybourne area all report adverse impacts to their agricultural land as a result of previous wind farm cables. These are largely the result of damage to underground watercourses and drainage and soil compaction. Further damage from future wind farm cables will make farming less and less viable on the fields affected.	No	Impacts to agricultural land have been assessed in **Section 19.7.1.1**, **19.7.1.2** and **19.7.1.3**. Cumulative effects on land are considered in **Section 19.8** (**ES Chapter 19 Land Use, Agriculture and Recreation** (document reference 6.1.19)). With regards to agriculture, mitigation measures during construction include the use of an ALO, ensuring agricultural drainage systems are maintained and employing best practice measures in line with a Soils Management Plan.

18 Onshore Ecology and Ornithology

Consultee	Comment	Development Change?	Response
Area of Outstanding Natural Beauty	Onshore Substation Access Please utilise the Norfolk Biodiversity Information Service to conduct searches on species and also refer to the Green Infrastructure Strategy. Is there a plan to mitigate impact or a potential community project which could be funded to provide access/biodiversity enhancement.	No	Noted – biological records for habitats and species has been obtained from the Norfolk Biodiversity Information Service (NBIS) to inform the ecological impact assessment. Biodiversity Net Gain (BNG) has been considered separately as a stand-alone evaluation of the overall biodiversity impact of SEP and DEP, using the defined BNG metric (3.0) and incorporating BNG specific compensation and enhancement measures. The Applicant is committed to achieving a positive net gain in biodiversity as presented in the **Initial Biodiversity Net Gain Assessment** (document reference 6.3.20.6).
Barford & Wramplingha	Whilst the comments in Q.16 and Q18 take precedent, if that fails and the corridor is allowed to go ahead, as minimum we	No	Noted although to clarify the project will not result in any ponds being

m Parish Council	request that all ponds that are in the path of the cables are relocated to nearby locations thereby protecting the biodiversity of the environment. Equinor states that it is proposing to carry out this work for up to 10 years. The scale of destruction proposed such as felling mature trees, removing old hedgerows, damaging grasslands, rivers and ponds, destroying longstanding and well-established habitats, ecosystems and wildlife corridors, inflicting traffic, noise and air pollution, with the inevitable death and scaring away of wildlife, makes it difficult to see how you will deliver any positive contribution to biodiversity. By what measure? At the very least, you should be proactive, and arrange to meet every parish council for detailed discussion of exactly what environmental damage you will be creating, exactly what you can do to keep that damage to the minimum and what you can do make a positive contribution before, during and afterwards. In addition, the carbon footprint of the cabling process on land requires independent measurement.		lost. Habitat and species specific surveys have been undertaken in 2020 and 2021, the findings of which are reported in separate standalone technical appendices which accompany the **ES Chapter 20: Onshore Ecology and Ornithology** (document reference 6.1.20). The findings from all surveys that have been undertaken have been used to inform the ecological impact assessment and identify the requirement for any further surveys and/or mitigation measures. Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within Outline Ecological Management Plan (document number 9.19).
Cley-next-the-sea Parish Council	Weybourne Woods • Equinor claims that it will use commercial forestry firebreaks or trenchless drilling, but the width of the cable corridor	No	Noted – a suite of over-wintering and breeding bird surveys have been undertaken across 2020 and 2021, the findings of which are

	required may result in fragmentation of the woodland which may make it less suitable for many of the bird species in the area. • The loss of habitat would need to be mitigated if there is a reduction in tree cover as a result of the cable laying		reported in standalone technical appendices that accompany the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20). The site selection process has considered and sought to avoid sensitive areas and where this has not been possible, the projects have committed to use technical solutions to minimise the potential impacts, for example but not limited to the adoption of trenchless crossing methodologies at Weybourne Woods. Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within **Outline Ecological Management Plan** (document number 9.19).
Cley-next-the-sea Parish Council	Migrating Birds • Surprisingly, the PEIR has not included the importance of the area for migrating birds.	No	Noted, since the publication of the PEIR, further refinements have been made to the DCO boundary. These refinements have also been informed by the ecological surveys

			undertaken to avoid where possible any sensitive ecologically identified areas. A suite of over-wintering and breeding bird surveys have been undertaken across 2020 and 2021, the findings of which are reported in standalone technical appendices that accompany the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20).
National Trust	Ornithological Impact National Trust has noted that the PEIR information supplied alongside the consultation contains substantial amounts of ornithological information and data. The Sandwich Tern colonies identified as being potentially impacted by the proposals are both within National Trust ownership, although the colony at Scolt Head is managed by Natural England. Both of the areas of land have exemplary management with significant investment and resource having been expended by both National Trust and Natural England on the designated features at the sites. National Trust is concerned about the	No	Noted. A suite of over-wintering and breeding bird surveys have been undertaken across 2020 and 2021, the findings of which are reported in standalone technical appendices that accompany the ES Chapter 20 Onshore Ecology and Ornithology (document reference 6.1.20). Details relating to the pre, during and post construction mitigation

	PEIR assessment that indicates that the proposals either alone or in combination during operation will result in a minor negative impact on these fragile colonies. Added to this is the increased collision risk arising from the proposed extensions, along with the cumulative effect arising with the existing and proposed windfarms in this part of the North Sea. National Trust considers that mitigation and compensation from these effects may be very difficult to achieve and would urge Equinor to consider all avoidance measures in the first instance. Any future shadow HRA will be carefully review by National Trust along with any supporting proposals as a result of its findings.		measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within **Outline Ecological Management Plan** (document number 9.19).
National Trust	National Trust would like to thank you for the opportunity to comment as part of the Phase Two consultation and consideration of the Preliminary Environmental Information Report (PEIR) in respect of the proposed Dudgeon and Sheringham Shoal Offshore Windfarm Extension Project. National Trust owns and manages over 3,500 hectares of land along the North Norfolk coast with a number of these sites having potential to be affected by the proposed offshore wind farm extensions at Dudgeon and Sheringham Shoal either directly as a result of the onshore cable route or indirectly through potential impacts on habitat and species. As an organisation with significant focus on nature conservation, landscape, heritage, and recreational enjoyment of the coast and countryside, we also have an interest in the environmental impacts of the project. We feel it is the remit of the Statutory	No	Since the publication of the PEIR, further refinements have been made to the DCO boundary through the site selection and route planning process. Where possible, this has considered and sought to avoid sensitive areas and where this has not been possible, the projects have committed to use technical solutions to minimise the potential impacts, for example but not limited to the adoption of trenchless crossing

	Consultees to comment on the environmental impacts of the project and see that there has already been engagement with Natural England, alongside RSPB, in respect of nature conservation matters and that Historic England has been involved in respect of heritage assets, alongside the Local Planning Authority's heritage specialists. The sites that National Trust has particularly identified as being potentially impacted are important nature conservation environments at Blakeney Point and Scolt Head, which are significant for their habitats, landscape character and ecology and this is recognised by their designations as an AONB, RAMSAR, SSSI, SPA and SAC with a number of the qualifying features of the SPA and SAC present at these sites. In addition, the proposed onshore cable route shows a potential option for passing through the western end of Sheringham Park at Weybourne Wood. Sheringham Park is a Grade II* Registered Park and Garden design by Humphry Repton in the early nineteenth century for Abbot Upcher. Repton considered the park to be his finest work. Unfortunately, National Trust currently has limited resources to input into these proposals but would like to make the following comments at the current time: Ornithological Impact National Trust has noted that the PEIR information supplied alongside the consultation contains substantial amounts of ornithological information and data. The Sandwich Tern colonies identified as being potentially impacted by the		methodologies at Weybourne Woods. The findings from ecological surveys undertaken in 2020 and 2021 have also been used to inform the site selection and route planning process to avoid any sensitive ecological areas/features where possible. Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within **Outline Ecological Management Plan** (document number 9.19).

	proposals are both within National Trust ownership, although the colony at Scolt Head is managed by Natural England. Both of the areas of land have exemplary management with significant investment and resource having been expended by both National Trust and Natural England on the designated features at the sites. National Trust is concerned about the PEIR assessment that indicates that the proposals either alone or in combination during operation will result in a minor negative impact on these fragile colonies. Added to this is the increased collision risk arising from the proposed extensions, along with the cumulative effect arising with the existing and proposed windfarms in this part of the North Sea. National Trust considers that mitigation and compensation from these effects may be very difficult to achieve and would urge Equinor to consider all avoidance measures in the first instance. Any future shadow HRA will be carefully review by National Trust along with any supporting proposals as a result of its findings. Impact on Seal Populations National Trust has noted that the PEIR has assessed the impact of the proposed extensions during both construction and operation on the grey and harbour seal populations. The closest haul-out site to the extension area is at Blakeney Point which is within National Trust ownership. It has been noted that it is considered there will be negligible to minor adverse impact on this site as a result of the proposals, given the minimum 12km distance, however National Trust would request that the proposed mitigation of maintaining transiting vessels 600m or		

	more off the coast near seal haul-out areas, especially during sensitive period, is incorporated into any future management regime.		
North Norfolk District Council (NNDC)	Chapter 22 - Onshore Ecology and Ornithology The contents of this chapter are noted together with the technical appendices. It is important that, as the project is developed and refined, there is a clear understanding of the habitats likely to be affected both within the final DCO 'red line' area but also any habitats nearby that could be affected by the project and which may require appropriate mitigation. It is noted that an Extended Phase 1 Habitat Survey (EP1HS) was undertaken in 2020 '…to record the habitats within the PEIR boundary and to identify the presence or likely presence of legally protected and notable species. The EP1HS covered approximately 65-70% of the PEIR boundary with the remaining 30% being currently unsurveyed due to no landowner access being granted. This area was reviewed using the Norfolk Living Maps from NBIS and where possible will be ground truthed once landowner access is obtained.' At paragraph 55 of Chapter 22 you have indicated that 'The EP1HS was further extended to include collection of data which will feed into Biodiversity Net Gain (BNG) calculations once the details of the construction footprint, methods and impacts are defined. The baseline data collected will be used	No	Noted. Since the publication of the PEIR, further refinements have been made to the DCO boundary. These refinements have also been informed by the ecological surveys undertaken to avoid where possible any sensitive ecologically identified areas. The Extended Phase 1 Habitat Survey was undertaken in 2020 and 2021 where landowner permission had been granted. Approximately 90% of the areas within the DCO boundary have been surveyed, with the remaining 10% having been assessed using the Norfolk Living Maps from NBIS. Biodiversity Net Gain (BNG) has been considered separately as a stand-alone evaluation of the overall biodiversity impact of SEP and DEP,

	to complete BNG calculations, using the relevant DEFRA metric and with a commitment to achieve a minimum 10% gain in biodiversity.' NNDC welcome the commitment from Equinor to achieving a minimum 10% gain in biodiversity. How this will be achieved across the projects will be important to clarify at DCO consent stage including whether it is for the project as a whole or is 10% across each District area or other defined areas. Confirmation would also be welcomed regarding the actual version of Defra metrics to be used in calculating the existing biodiversity from which the 10% figure is to be derived. NNDC understands that metric 2.0 is the latest iteration in beta form but this may be refined further with version 3.0 expected to be released later this year. Finally, in respect of over wintering birds, NNDC have a number of concerns about how the project can be managed across extended timeframes. Crop rotation will rotate potential habitats for over wintering birds including arable fields with stubble (unploughed harvested cereal crops) or sugar beet crops and over wintering birds may be affected by construction activities to a greater or lesser degree dependent on crop rotations and proximity to cable construction corridors. There is likely some further work to be done with a range of interested parties to understand and mitigate any impacts from the SEP and DEP project and also from the Hornsea Three project which has the potential to be constructed across a similar		using the defined BNG metric (3.0) and incorporating BNG specific compensation and enhancement measures. The Applicant is committed to achieving a positive net gain in biodiversity as presented in the **Initial Biodiversity Net Gain Assessment** (document reference 6.3.20.6). A suite of over-wintering and breeding bird surveys have been undertaken across 2020 and 2021, the findings of which are reported in standalone technical appendices that accompany **the ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20). Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within **Outline**

	timeframe and this increases the potential for areas of habitat loss and disturbance for over wintering birds.		**Ecological Management Plan** (document number 9.19).
Swainsthorpe Parish Council	The area in question, including Hickling lane, represent important wild life habitat and provide highly valued amenity walks which we would not want lost. We would hope that the project would budget for reinstating and making any practicable improvements to effected areas. If access to and egress from the construction site can both be made practical from the single existing A140 junction with the national grid substation, without involving Hickling lane at all, this would be preferable.	No	Since the publication of the PEIR, further refinements have been made to the DCO boundary. These refinements have also been informed by the ecological surveys undertaken to avoid where possible any sensitive ecologically identified areas. All areas of temporary works associated with the projects will be reinstated on their completion. The areas of permanent works (e.g. onshore substation) will include landscape mitigation planting proposals, which are detailed within the **Outline Landscape Management Plan** (document number 9.18). Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented

			(and will be secured through a DCO Requirement) within **Outline Ecological Management Plan** (document number 9.19).
The Wildlife Trust and Norfolk Wildlife Trust	Volume 1, Chapter 22 – Onshore Ecology and Ornithology Summary Given the need for further revision of the precise cable corridor prior to submission of the formal Environmental Statement (ES) and the further surveys currently still being carried out, our comments are made broadly. We welcome the aspiration wherever possible to avoid impacts on areas of known wildlife value (statutory sites, County Wildlife Sites, Priority Habitats and areas where protected species have been recorded) through avoidance or the use of Horizontal Direct Drilling (HDD). However, we note that as the site design is not yet completed, there remains the potential for temporary and permanent impacts in all phases of the proposal. We recognise and broadly support the proposed avoidance, mitigation and compensatory measures set out, but make the following comments, which we would be happy to discuss with the applicant between now and the submission of the formal ES in the hope that our concerns can be satisfactorily addressed.	No	Noted. The site selection process has considered and sought to avoid sensitive areas and where this has not been possible, the projects have committed to use technical solutions to minimise the potential impacts, for example but not limited to the adoption of trenchless crossing methodologies at Weybourne Woods. The **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) presents the specific onshore ecology and ornithology receptors that have been identified for consideration (as informed from the findings of the baseline surveys undertaken to date) along with the

			categorisation of their sensitivity and value that has been assigned to them. Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within **Outline Ecological Management Plan** (document number 9.19).
The Wildlife Trust and Norfolk Wildlife Trust	Volume 1, Chapter 22 – Onshore Ecology and Ornithology River crossings (para 113) – we note the proposal to HDD under all main river crossings in order to avoid impacts on the rivers, at a depth that is predicted to avoid any impacts on the river bed and to avoid any accidental release of materials such as bentonite into the river channel. We recommend that the assessment includes an evaluation of the potential impacts of HDD on any features such as springs or other underground flows that may, if interrupted, impact on the river, for example where the proposed corridor is adjacent to the source and headwaters of the River Glaven.	No	Noted - consideration of springs or other underground flows form part of the water resources assessment. However, any ecological considerations associated with springs and/or other underground flows (e.g. water dependent habitats) have been considered within the onshore ecology assessment (**ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20).

The Wildlife Trust and Norfolk Wildlife Trust	Volume 1, Chapter 22 – Onshore Ecology and Ornithology Survey gaps – the PEIR refers to the incomplete survey coverage due to some access permissions being denied. The ES will need to clearly identify where there are any outstanding gaps in the survey coverage at the time of the application, and the precautionary approach taken to wildlife presence in order to provide sufficient certainty that impacts on protected habitats and species are avoided.	No	Noted. Landowner permission has been granted for approximately 90% of the areas within the DCO boundary, with the remaining 10% having been assessed using the Norfolk Living Maps from NBIS. Constraints and limitations encountered during the baseline ecological surveys undertaken to date are acknowledged and presented in the accompanying Technical Appendices which accompany **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20).
The Wildlife Trust and Norfolk Wildlife Trust	Volume 1, Chapter 22 – Onshore Ecology and Ornithology River Wensum SAC (para 167) – we note the HDD is proposed to completely avoid impacts on the SAC, but we seek clarification on any potential impacts from siting the temporary compounds nearby. The SAC is flanked by floodplain wetland CWSs which are functionally linked to the health of the SAC	Yes	The Applicant has committed to cross the River Wensum using trenchless techniques to minimise the potential for any impacts to this designated site. The siting of the HDD entry and exit pits will be located outwith this designated site

	and so indirect impacts on the SAC are possible if there are any impacts on the adjacent CWSs.		and/or any functionally linked habitat.
The Wildlife Trust and Norfolk Wildlife Trust	Volume 1, Chapter 22 – Onshore Ecology and Ornithology Lighting (para 185) – we note the proposed minimising of artificial lighting in paragraph 185. We recommend that wherever the route crosses known or potential bat commuting or foraging sites (i.e. where bat presence/activity has not been categorically ruled out), that a precautionary approach is taken and works are restricted to daylight hours only in order to avoid habitat severance.	No	A suite of monthly bat activity and deployment of static bat detectors have been undertaken to understand the usage of habitats within the DCO boundary by foraging/commuting bats. The findings of these surveys are presented in technical appendices which accompany the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20); however, the findings from these surveys have been used to inform the ecological impact assessment presented in **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20). This assessment has considered the potential impacts on biodiversity through disruption and destruction of key habitats, including foraging/commuting bats. Any lighting requirements have been

			designed in accordance with The Bat Conservation Trust (BCT) guidance for artificial lighting. Details relating to the pre, during and post construction mitigation measures for bats is presented (and will be secured through a DCO Requirement) within **Outline Ecological Management Plan** (document number 9.19).
The Wildlife Trust and Norfolk Wildlife Trust	Volume 1, Chapter 22 – Onshore Ecology and Ornithology Woodland impacts (para 221) – we are concerned at the significant impacts of the proposal where it crosses woodland, given the long timescales needed for any meaningful habitat restoration, in particular where this results in additional impacts for mobile species such as bats from severance. We would expect the application to adopt avoidance in such situations and commit to the use of HDD, if micro-siting of the route is unable to avoid the woodland entirely.	Yes	The site selection process has considered and sought to avoid sensitive areas and where this has not been possible, the projects have committed to use technical solutions to minimise the potential impacts, for example but not limited to the adoption of trenchless crossing methodologies at Weybourne Woods. The Applicant has sought to further avoid woodland as much as possible - either microsting when reducing the Order limits from 200m

			down to 60m, or use of trenchless crossings. There will remain individual trees in hedgerows that may be unavoidably lost. All areas of temporary works associated with the projects will be reinstated on their completion. Details on the proposed landscape mitigation planting proposals are detailed within the **Outline Landscape Management Plan** (document number 9.18). Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within the **Outline Ecological Management Plan** (document number 9.19).
The Wildlife Trust and Norfolk Wildlife Trust	Volume 1, Chapter 22 – Onshore Ecology and Ornithology Habitat restoration and new habitat creation (para 213) – we note the aspiration wherever possible to restore habitats in-situ post-construction. We support this approach in principle,	No	Noted. All areas of temporary works associated with the projects will be reinstated on their completion.

	subject to the local circumstances. Where the habitats subject to the temporary impacts are not recently planted or sown commercial crops (e.g. recently sown wildflower field margins or recently planted monoculture hedgerows) that wherever possible the restoration should be achieved through the use of carefully collected turf and local seeds. The use of local provenance materials for habitat restoration has a higher chance of success due to its local adaptation and helps preserve the local genetic diversity. NWT have experience of this approach and would be happy to discuss best practice methods for inclusion in the Outline Landscape and Ecological Management Strategy, if that would be considered beneficial.		Landscape mitigation planting proposals are detailed within the **Outline Landscape Management Plan** (document number 9.18) and details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within the **Outline Ecological Management Plan** (document number 9.19).
The Wildlife Trust and Norfolk Wildlife Trust	Volume 1, Chapter 22 – Onshore Ecology and Ornithology Great crested newts (para 250) – the PEIR indicates that any great crested newt breeding ponds will be replaced and restored following the construction impacts. The wording suggests that this would be on a 1:1 basis, whereas we would expect any such pond creation/ restoration to be above that lost in to properly compensate for the loss of breeding habitat and disturbance during the construction phase. Given the time available before construction is anticipated to commence, it should also be possible the commence works on compensatory habitats (our comment here can also be applied to any other compensatory habitat proposed as part of the ES) in advance of the construction works, to minimise the extent of temporary losses during the construction phase.	No	Noted. No ponds will be lost of the projects; however, a suite of great crested newt eDNA surveys have been undertaken. The findings of which have been used to submit a District Level Licence agreement to Natural England.

The Wildlife Trust and Norfolk Wildlife Trust	Volume 1, Chapter 22 – Onshore Ecology and Ornithology Bats (Impact 13) – we note the proposed use of bat boxes as part of any mitigation for impacts on bat roosts. We note the findings of recent research (Stone, E.L., Jones, G. & Harris, S., 2013 Mitigating the effect of development on bats in England with derogation licensing. Conservation Biology, 27, 1324-1334) which indicates that bat boxes often have low uptake and recommend that this is noted in any evaluation of the likely success of bat boxes as mitigation for impacts.	No	Noted. A suite of bat emergence/re-entry surveys have been undertaken in 2021 of those features which have been assessed as providing moderate or high potential to support roosting bats. Two trees confirmed to support roosting bats will require removal and therefore a draft bat mitigation licence has been prepared and submitted to Natural England for obtaining a Letter of No Impediment (LoNI). The draft mitigation licence includes the requirement for the Applicant to replace these two lost bat roosting sites through the installation of two bat boxes. In addition and for longer term benefits, replacement oak trees will be planted to replace these two removed trees.
The Wildlife Trust and Norfolk Wildlife Trust	Volume 1, Chapter 22 – Onshore Ecology and Ornithology Cumulative impacts (section 22.7) - the cumulative impacts will also need to consider the proposed Norwich Western Link trunk road proposal. Norfolk County Council recently (7th June 2021) voted to appoint a contractor and proceed with	No	Noted and all available information relating to the Norwich Western Link trunk road (as well as any other projects/plans) has been reviewed and incorporated within the CIA

	preparatory work for a planning application expected in early 2022. Survey work by Wild Wings Ecology, independent to the planning application, has identified a nationally significant population of barbastelle bats in woodlands between the Tud and Wensum river valleys. Whilst figure 22.2 indicates that the proposed route will avoid much of the woodland in this area, we recommend further direct discussion with the applicant on the micro-siting of the route in this area as a matter of urgency.		presented in the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20).
Weybourne Parish Council	Beach Lane • Beach Lane is a narrow road, used by tourist traffic, local residents, local fishermen and the emergency services (Coastguard). It is not suitable for HGVs. Moreover, the presence of construction traffic would have a strongly adverse effect on tourism and local quality of life. • Beach Lane is a CWS, and is thus recognised as being of wildlife importance. Its close proximity to the landfall site makes it vulnerable. • The pond/reedbed is an important habitat, and one which is rare in North Norfolk. The PEIR refers to a breeding pair of Cetti's Warbler, which are Schedule 1 birds; this year there are at least 2, possibly 3 singing males, meaning this site is even more important for this species. • Both Water Voles and Otters use the Beck and surrounding area. The Environment Agency is aware of the presence of Water Voles as it had to stop its own works as a result of their presence.	No	Noted. Since the publication of the PEIR, further refinements have been made to the DCO boundary. These refinements have also been informed by the ecological surveys undertaken to avoid where possible any sensitive ecologically identified areas. Beach Lane is now predominately outwith the DCO boundary, with the exception of its northern part. A suite of onshore ecological surveys has been undertaken in 2020 and 2021, the findings of which have been used to inform the ecological impact assessment in the

	• Both Sir Michael Savory and Clive Hay-Smith have plans to create wildflower meadows adjacent to Beach Road. Pollution and disturbance will hamper the development of these projects, which are important to help to reverse the biodiversity crisis.		**ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20). Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within the **Outline Ecological Management Plan** (document number 9.19).
Weybourne Parish Council	Migrating Birds • The PEIR has not included the importance of the Weybourne area for migrating birds. Why not? • Weybourne/Muckleburgh is an important landfall/take-off site for migratory birds, and provides a scarce habitat which birds can use for resting/foraging on arrival or prior to leaving. There are few other similar features on the North Norfolk coast.	No	Noted and justification as to the rationale for the survey effort is presented within ES Chapter 20 Onshore Ecology and Ornithology (document reference 6.1.20). A suite of over-wintering and breeding bird surveys have been undertaken in 2020 and 2021, the findings of which have been used to inform the ecological impact assessment presented in the ES Chapter 20 Onshore Ecology and Ornithology (document reference 6.1.20).

			Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within the **Outline Ecological Management Plan** (document number 9.19).
Weybourne Parish Council	Spring Beck • Spring Beck is a chalk stream, an internationally rare habitat. • The EA has been carrying out work to improve the watercourse, and it now features Brown Trout, Otters and Kingfisher. • Equinor has stated that it will cross Spring Beck using HDD, and it is critical that it sticks to this commitment. • There is concern about flooding and disruption to underground water (springs, aquifers etc), as has been the experience with previous wind farm wokrs.	No	Noted.
Woodland Trust	Ancient Woodland Natural England1 and the Forestry Commission defines ancient woodland “as an irreplaceable habitat [which] is important for its: wildlife (which include rare and threatened species); soils; recreational value; cultural, historical and landscape value [which] has been wooded continuously since at least 1600AD.”	No	Since the publication of the PEIR, further refinements have been made to the DCO boundary which has resulted in the avoidance of ancient woodland. There will remain individual trees in hedgerows that may be unavoidably lost. In addition, the projects have committed to use

	It includes: “Ancient semi-natural woodland [ASNW] mainly made up of trees and shrubs native to the site, usually arising from natural regeneration Plantations on ancient woodland sites – [PAWS] replanted with conifer or broadleaved trees that retain ancient woodland features, such as undisturbed soil, ground flora and fungi” Both ASNW and PAWS woodland are given equal protection in government’s National Planning Policy Framework (NPPF) regardless of the woodland’s condition, size or features. In addition, Ringland Covert appears on maps dated in the 1880s and is referred to within the Phase 1 Habitat survey accompanying this consultation as ancient woodland. The site, therefore, is of historical and ecological importance and Natural England should be consulted for their opinion on the scheme, the antiquity of the site and its likely effects on this important piece of woodland.		technical solutions to minimise the potential impacts, for example but not limited to the adoption of trenchless crossing methodologies at Weybourne Woods. . Based on results from ground investigations carried out late summer 2021, we confirmed the feasibility of a horizontal directional drill beneath Weybourne Woods. The preferred route was selected over the other options because: • It avoids using open cut installation requiring an extended closure of Sandy Hill Lane. • It avoids an open cut installation through the woodland resulting in more widespread tree loss and a greater impact to ecological receptors and recreational use. • It is the most direct and shortest distance, minimising the overall

			footprint and number of properties that will be impacted. • It is technically feasible while maximising the distance to the nearest receptors.
Woodland Trust	Veteran Trees Natural England's standing advice on veteran trees states that they "can be individual trees or groups of trees within wood pastures, historic parkland, hedgerows, orchards, parks or other areas. They are often found outside ancient woodlands. They are irreplaceable habitats with some or all of the following characteristics… A veteran tree may not be very old, but it has decay features, such as branch death and hollowing. These features contribute to its biodiversity, cultural and heritage value."	No	A targeted arboricultural survey has been undertaken to inform the EIA and is presented in **Appendix 20.15** of the **ES**. The survey was informed by a desk study that considered known protected and high value trees within the entire DCO boundary such as trees with a Tree Preservation Order, in a Conservation Area, within an Area of Outstanding Natural Beauty and veteran/ancient trees. In advance of construction a full arboricultural survey of the entire DCO boundary would be undertaken by an appropriately experienced arboriculturalist. This survey will define specific mitigation measures to protect trees situated adjacent to the working corridor,

			including defining root protection areas. The arboricultural report would be submitted to and agreed with the local authority prior to the commencement of any construction works.
Woodland Trust	Planning Policy The National Planning Policy Framework, paragraph 175 states: “When determining planning applications, local planning authorities should apply the following principles: c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons58 and a suitable compensation strategy exists; Footnote 58, defines exceptional reasons as follows: “For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat.” Paragraph 5.3.14 of the Overarching National Policy Statement for Energy (EN-1) states: “Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its	No	Since the publication of the PEIR the Applicant has sought to further avoid woodland (and other sensitive ecological areas) as much as possible - either microsting when reducing the Order limits from 200m down to 60m, or use of trencheless crossings. There will remain individual trees in hedgerows that may be unavoidably lost. In addition, the projects have committed to use technical solutions to minimise the potential impacts, for example but not limited to the adoption of trenchless crossing methodologies at Weybourne Woods. Based on results from ground investigations carried out late

	longevity as woodland. Once lost it cannot be recreated. The IPC should not grant development consent for any development that would result in its loss or deterioration unless the benefits (including need) of the development, in that location outweigh the loss of the woodland habitat. Aged or 'veteran' trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. Where such trees would be affected by development proposals the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons why."		summer 2021, we confirmed the feasibility of a horizontal directional drill beneath Weybourne Woods. The preferred route was selected over the other options because: • It avoids using open cut installation requiring an extended closure of Sandy Hill Lane. • It avoids an open cut installation through the woodland resulting in more widespread tree loss and a greater impact to ecological receptors and recreational use. • It is the most direct and shortest distance, minimising the overall footprint and number of properties that will be impacted. • It is technically feasible while maximising the distance to the nearest receptors.
Woodland Trust	Impacts to Ancient Woodland The Woodland Trust is concerned about the proximity of the onshore cable corridor to Colton Wood (grid reference: TG11680878), an area of ancient woodland designated as a	No	Since the publication of the PEIR, further refinements have been made to the DCO boundary which has resulted in the avoidance of ancient

	Plantation on Ancient Woodland Site (PAWS) on Natural England's Ancient Woodland Inventory. We are also very concerned about the potential direct loss of Ringland Covert, which is likely an area of unmapped ancient woodland. Natural England has identified the impacts of development on ancient woodland or veteran trees within their standing advice. This guidance should be considered as Natural England's position with regards to development impacting ancient woodland: "Direct impacts of development on ancient woodland or ancient and veteran trees include: • damaging or destroying all or part of them (including their soils, ground flora, or fungi) • damaging roots and understorey (all the vegetation under the taller trees) • damaging or compacting soil around the tree roots • polluting the ground around them • changing the water table or drainage of woodland or individual trees • damaging archaeological features or heritage assets" Development in ancient woodland can lead to long-term changes in species composition, particularly ground flora and sensitive fauna, i.e. nesting birds, mammals and reptiles. Majorly adverse impacts would occur as a result of the removal		woodland. There will remain individual trees in hedgerows that may be unavoidably lost. In addition, the projects have committed to use technical solutions to minimise the potential impacts, for example but not limited to the adoption of trenchless crossing methodologies at Weybourne Woods. The preferred route was selected over the other options because: • It avoids using open cut installation requiring an extended closure of Sandy Hill Lane. • It avoids an open cut installation through the woodland resulting in more widespread tree loss and a greater impact to ecological receptors and recreational use. • It is the most direct and shortest distance, minimising the overall footprint and number of properties that will be impacted.

	of the ancient woodland, which contains valuable habitat, to make way for the construction of this proposal. Natural England's Standing Advice goes on to state: "Nearby development can also have an indirect impact on ancient woodland or veteran trees and the species they support. These can include: • breaking up or destroying connections between woodlands and veteran trees • reducing the amount of semi-natural habitats next to ancient woodland and other habitats • increasing the amount of pollution, including dust • increasing disturbance to wildlife from additional traffic and visitors • increasing light pollution • increasing damaging activities like fly-tipping and the impact of domestic pets • changing the landscape character of the area" Our concerns focus on the construction of underground cables within or adjacent to ancient woodland. Alongside the direct loss of ancient woodland soils to facilitate the cable installation (in the case of Ringland Covert), the Trust is concerned about damage to ancient woodland tree roots which would likely affect the longevity of those trees.		• It is technically feasible while maximising the distance to the nearest receptors.

Woodland Trust	Mitigation Natural England's standing advice for ancient woodland, states: "Mitigation measures will depend on the development but could include: • improving the condition of the woodland • putting up screening barriers to protect woodland or ancient and veteran trees from dust and pollution • noise or light reduction measures • protecting ancient and veteran trees by designing open space around them • identifying and protecting trees that could become ancient and veteran trees in the future • rerouting footpaths • removing invasive species • buffer zones" This scheme should allow for a buffer zone of at least 30 metres to avoid root damage and to allow for the future growth of trees which form the ancient woodland boundary that are within proximity to the cable corridor route. If not appropriately accounted for, trees may become subject to removal if they are considered to impact on the cables belowground, affecting their long-term viability. During construction, HERAS fencing fitted with acoustic and dust screening measures should be put in place to ensure that the buffer zone does not suffer from encroachment of construction vehicles/stockpiles.	No	Landscape mitigation planting proposals are detailed within the **Outline Landscape Management Plan** (document number 9.18) and details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors (including habitats) is presented (and will be secured through a DCO Requirement) within the **Outline Ecological Management Plan** (document number 9.19).

	This is backed up by Natural England's standing advice which states that "you should have a buffer zone of at least 15 metres to avoid root damage. Where assessment shows other impacts are likely to extend beyond this distance, you're likely to need a larger buffer zone. For example, the effect of air pollution from development that results in a significant increase in traffic." For any ancient or veteran trees found within proximity to the proposed cable alignment, Natural England's standing advice states that "a buffer zone around an ancient or veteran tree should be at least 15 times larger than the diameter of the tree. The buffer zone should be 5m from the edge of the tree's canopy if that area is larger than 15 times the tree's diameter."		
Woodland Trust	Conclusion Ancient woodland is an irreplaceable habitat, once lost it is gone forever. The Woodland Trust holds considerable concerns with regards to the potential impact to ancient woods and trees. We ask that the following considerations are taken into account during further design refinement: • All areas of ancient woodland are afforded a buffer zone of at least 30m to provide adequate protection and secure their continued longevity. • The ancient woodland status of Hall Hills/Ringland Covert is investigated in consultation with Natural England, to ensure all	No	Noted and this has been considered where required within the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20). As set out in **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) the onshore cable corridor route does not pass directly through any Ancient Woodland.

	areas of ancient woodland are fully accounted for within the design process. • All veteran trees within proximity to the proposed cable alignment are provided with a root protection area of 15 times the stem diameter in line with Natural England's Standing Advice.		
Natural England	Summary of Main Points 4) Impacts on the Natural Environment · Onshore Ecology Overall there are gaps in survey data due to varying reasons (bat detector failure, change of cable route, limited landowner access) these need to be filled in by 2021 data and therefore our advice is constrained by this. Therefore, many of our comments are in relation to further evidence, information and/or clarity being provided in the Environmental Statement.	No	Since the publication of the PEIR, the onshore ecological survey efforts have continued where landowner access has been granted. Approximately 90% of the area within the DCO boundary has been surveyed, with the remaining 10% having been assessed using the Norfolk Living Maps obtained from NBIS. All of the onshore ecological surveys have been undertaken by suitably qualified ecologists and where necessary, licenced ecologists and at the appropriate time of year. The findings from all ecological surveys undertaken to date have been used to inform the ecological

			impact assessment presented in **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20). The findings from each species-specific survey are reported in standalone technical appendices which accompany the ES chapter. Constraints and limitations encountered during the baseline ecological surveys undertaken to date are acknowledged and presented in the respective accompanying survey reports.
Natural England	Annex 9 Onshore Ecology and Air Quality In formulating these comments the following documents have been considered: - Volume 1 Chapter 22 Onshore Ecology and Ornithology - Volume 2 Chapter 22 Onshore Ecology and Ornithology Figure 22.1 to 22.3 - Volume 3 Appendix 22.1 – Extended Phase 1 Habitat Survey - Volume 3 Appendix 22.2 – GCN Survey Report - Volume 3 Appendix 22.3 - Bat Survey Report - Volume 3 Appendix 22.4 - Overwintering Bird Survey - Volume 3 Appendix 22.5 – Breeding Birds Report - Volume 3 Appendix 22.6 – Net Gain	No	Noted and no action required at this time.

	- Volume 3 Appendix 22.7 – Desk Study - Volume 1 Chapter 24 Air Quality - Volume 2 Chapter 24 Figures - Volume 3 Appendix 24.1 Construction Dust Methodology - Volume 3 Appendix 24.2 Traffic Data - Volume 3 Appendix 24.3 Air Quality Background Pollutant Concentrations - Volume 3 Appendix 24.4 Designated Ecological Sites & Critical Load Values in the Air Quality Study Area		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.3.1 Comment NE note that different study areas have been used for different receptors e.g. GCN (which are realistically likely to experience impacts beyond the confines of the PEIR boundary) depending on their sensitivity and their habitat preferences. Recommendations No changes required.	No	Noted. **Section 20.3.1** of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) presents the study areas that have been identified and used to inform the ecological impact assessment. These study areas have been defined using professional judgement and in accordance with industry guidance.

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.3.1 Comment The discrepancy between survey areas and the study area, due to the PEIR boundary being redefined during the course of ecological surveys and engineering feasibility studies, plus limited landowner access at the time is resulting in 'a small number of areas' not being surveyed or fully surveyed. Recommendations Further clarification is needed re un-surveyed and partly-surveyed areas – please refer to Appendix specific comments below for more detail.	No	Noted. Since the publication of the PEIR, the onshore ecological survey efforts have continued where landowner access has been granted. Approximately 90% of the area within the DCO boundary has been surveyed, with the remaining 10% having been assessed using the Norfolk Living Maps obtained from NBIS. Constraints and limitations encountered during the baseline ecological surveys undertaken to date are acknowledged and presented in the respective accompanying survey reports.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.3.2.1	No	Noted. **Section 20.3.2** of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) presents the Realistic Worst-Case Scenario (RWCS) for which

	Comment The realistic worst-case scenario is defined in terms of the potential effects that may arise. Recommendations Because the Rochdale Envelope approach maintains flexibility in consent, NE advise that project parameters are clearly defined and that a realistic worst-case scenario is used to enable assessment of potential impacts. Evidence needs to be drawn from the construction of other projects to do this. Although the Applicant has used the realistic worst-case scenarios throughout the main chapter (22), it is unclear if this has been informed by other projects or not?.		the ecological impact assessment has used for onshore ecology and ornithology receptors. The RWCS has been developed by the Applicant, drawing on information from their experience and/or other projects.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.4.2.2.2 Comment “Surveys focussed on areas within 10km of the landfall location on the North Norfolk Coast, the PEIR boundary crossings of the Rivers Wensum and Yare and the onshore substation zone (which is also the only part of the PEIR boundary within 10km of Broadland SPA).”	No	No changes required and therefore no action required.

	This should allow for the consideration of functionally linked land. Recommendations No changes required.		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.4.2.2.3 Comment As above, 10km is also used for wintering birds survey to allow for functionally linked land to be considered. Recommendations No changes required.	No	No changes required and therefore no action required.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.5.1 Table 22-9 Comment	No	Noted. A desk-based review, including the obtaining of biological data records from NBIS, has been undertaken and the findings of which are presented in **Appendix 20.7 Onshore Ecology Desk Study**

	Table 22-9 includes designated sites within the PEIR boundary – what about those outside the boundary that will still be impacted (zones of influence, functionally linked land, mobile species, etc)? e.g. Alderford Common SSSI (near the river Wensum) is noted to be important for bats (Pg 12 of Desk Study in Appendix 22.7) Recommendations NE recommend the Applicant provides a table similar to 22-9 but for designated sites outside the PEIR boundary that will be impacted (zones of influence, functionally linked land, mobile species, etc). The Impact Risk Zone (IRZ) layers on MAGIC could be used to assist with this.		(document reference 6.3.20.7). **Section 4** of **Appendix 20.7 Onshore Ecology Desk Study** (document reference 6.3.20.7). presents the statutory and non-statutory designated sites that are within the DCO boundary and up to 2km from its boundaries. **Section 20.3.1** of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) presents the study areas that have been identified and used to inform the ecological impact assessment. These study areas have been defined using professional judgement and in accordance with industry guidance. Where potential for direct or indirect impacts on designated sites have been predicted, these are presented in **Section 20.6** of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20)), along with explanations as

			to the anticipated mechanism of the impact and its extent.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.5.2 Comment The Norfolk Living Map has been used for areas where data was not collected during surveying due to restrictions. In Appendix 22.1 it states that 'The conclusions of which will be subject to ground truthing once landowner access has been obtained' – this needs to be done before the impact is assessed to ensure the impacts are an accurate representation. In the meantime, it seems RWCS will be used (as stated in section 22.4.6 Assumptions and Limitations, point 100). Recommendations Gaps in survey data need filling to ensure the associated predicted impacts are as accurate as possible.	No	Since the publication of the PEIR, the onshore ecological survey efforts have continued where landowner access has been granted. Approximately 90% of the area within the DCO boundary has been surveyed, with the remaining 10% having been assessed using the Norfolk Living Maps obtained from NBIS. Constraints and limitations encountered during the baseline ecological surveys undertaken to date are acknowledged and presented in the respective accompanying survey reports. **Section 20.6** of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) presents the specific onshore ecology and ornithology receptors that have been identified

			for consideration (as informed from the findings of the baseline surveys undertaken to date) along with the categorisation of their sensitivity and value that has been assigned to them.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.5.3.7 Table 22- 11 Comment Average number of registered bats per nights of detector deployment are displayed without standard error/deviation to show the amount of variation of values. Again, we note that there lots of data missing here due to ND (no deployment). Recommendations Request SD/SE is reported with all averages and ensure that data gaps are filled by proposed 2021 surveys.	No	The average number of bat registrations per night is the best way to present the data. Standard Deviation/Standard Errors are considered to not be useful. The reason that the numbers of registrations vary night by night is extremely likely to be linked to weather conditions (e.g. on a cold, windy, wet night, there will likely be very few bat registrations). Therefore, the average provides an accurate reflection of real-world bat activity. To clarify the aim of the bat static detector surveys was to obtain a very broad indication of general bat activity in certain swathes of the route, not to provide high-level detail

			on precise bat activity at the exact points the detectors were deployed. ND (no deployments) were related to limited commitment to bat surveys because of uncertainty over the route and limited landowner access at the time of the survey effort.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.6.1.1.1, 22.6.1.1.2 (also links to 22.6.1.9.1) Comment (Re. point 169) – The Applicant states that without mitigation the magnitude of effect related to a potential breakout of inert drilling fluids associated with the HDD technique will be a 'temporary, low negative impact' - but NE is unsure what this conclusion based on. It is not clear how the magnitude will be assessed accurately without knowing the duration of the impact/how quickly it can be stopped if breakout occurred, etc. This has a knock-on effect on the conclusions reached in points 170 (impact significance) and 175 (residual impacts).	No	Noted. Consideration of a potential bentonite breakout is presented in **Section 20.6** of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20). The Applicant has committed to the adoption of mitigation measures should a bentonite breakout occur. In addition, a bentonite breakout mitigation plan would be developed adhering to industry best practice during construction that will help to minimise the likelihood of a breakout. This will include ensuring effective removal of the cuttings

	Given the recent HDD drilling mud breakouts experienced on a number of other OWFs, Natural England advises that a commitment to use best available techniques and a precautionary methodology be included, and that the worst-case scenario impacts of potential bentonite breakout are assessed. Given that the River Wensum SAC (and SSSI) are largely unfavourable recovering or unfavourable no change we would advise that any effects may constitute an adverse effect on integrity. We advise the Applicant to partner with Environment Agency on the River Wensum Partnership project. The Applicant needs to outline potential impacts of a drilling mud breakout either under, or in the floodplains of, the Wensum, and the potential effects on SAC and SSSI features that may be located up or downstream of the breakout. There is currently insufficient information provided in the documents provided on HDD tolerance monitoring, how quickly bentonite release can be stopped, or an assessment of a worst-case scenario bentonite breakout considering extent, timings, and environmental impacts. Recommendations The Applicant needs to provide information on HDD tolerance monitoring, how quickly bentonite release can be stopped, or an assessment of a worst-case scenario bentonite breakout considering extent, timings, and environmental impacts. As with Norfolk Boreas, NE suggests that the Applicant partner with Environment Agency on the River Wensum Partnership		from the borehole which is a key component of avoiding breakouts.

	project. In addition, the restoration of the HDD compound on the flood plain of the river Wensum should be restored in accordance with the River Wensum Restoration Strategy and the River Wensum SAC conservation objectives Supplementary Advice. Where possible, measures should restore appropriate soil/ground moisture conditions so that water levels are continuously at or just above the ground surface throughout the year. We request that all bentonite breakouts within designated sites should be reported to NE within 24 hours and before clean-up operations begin.		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.6.1.3 Comment The Applicant mentions arable field margins being reinstated after construction, but it is unclear what surveying is being conducted post-construction to ensure success. There is currently only limited onshore post construction survey	No	All areas of temporary works will be reinstated to as pre works condition (as detailed in landowner agreements). Any reinstated landscape areas will be implemented in accordance with the measures outlined in the **Outline Landscape Management Plan** (document number 9.18). The length of monitoring will depend on the habitat type. It is proposed that a 10 year management plan will

	or monitoring proposed to ensure protected habitats and species have been successfully reinstated post construction. Within the OLEMS post construction monitoring is currently only proposed for water voles and newts. Natural England advise that a commitment to monitoring is also included for other priority habitats and protected species which will be affected, such as hedgerows used by bats, grasslands, ponds, cereal field margins etc. Recommendations Recommend that the OLEMS (to be submitted with the final DCO application) contains a commitment to post-construction surveying/monitoring for designated habitats and species that will be affected, such as hedgerows used by bats, grasslands, ponds, GCN, cereal field margins, etc. Currently post-construction surveying is only proposed for voles (point 360 in chapter 22.6.1.20.3). Also, the 'Potential Monitoring Requirements' (Chapter 22.11) for other species and habitats doesn't specify if this monitoring is taking place during or after construction, or both – clarification needed here.		be in place for hedgerows/trees and other sensitive habitats. At present it is not proposed to monitor reinstatement of arable field margins. Details relating to the pre, during and post construction mitigation measures and monitoring requirements for onshore ecology and ornithology receptors (including habitats) is presented (and will be secured through a DCO Requirement) within the **Outline Ecological Management Plan** (document number 9.19).
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology	No	Noted. **Section 20.3.1** of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) presents the ecological

	Section 22.6.1.4.3 Comment “Possibility of transplanting well-established and ecologically valued grassland followed by reinstatement post construction to be discussed at ES stage once the full extent of impacts on semi-improved neutral grasslands is known.” Recommendations Ensure this is considered at the ES stage as mentioned.		impact assessment relating to habitats. There are no proposals to translocate grassland habitat as through the site selection and route planning process further refinements have been made to avoid where possible sensitive ecological areas/features. Whilst temporary impacts are predicted on habitats, these areas will be reinstated on completion of the works to their pre-work condition. Details relating to the pre, during and post construction mitigation measures and monitoring requirements for onshore ecology and ornithology receptors (including habitats) is presented (and will be secured through a DCO Requirement) within the **Outline Ecological Management Plan** (document number 9.19).
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology	No	Biodiversity Net Gain (BNG) has been considered separately as a stand-alone evaluation of the overall biodiversity impact of SEP and DEP,

	Section 22.6.1.7 Comment Biological Net Gain is partly focused on hedgerow habitats – including in-filled and new hedgerows. The Applicant needs to ensure this is done as hedgerows are also important habitats and connections within the landscape for nesting birds, badgers, hedgehogs, amphibians, invertebrates, and reptiles. Recommendations NE welcomes that BNG details are being considered for hedgerows within the OLEMS and the proposed ecological mitigation and enhancement package. However, NE emphasise the importance of ensuring restoration to address potential impacts around particular areas, such as those used by bats (e.g. near the River Wensum, Alderford Common SSSI)		using the defined BNG metric and incorporating BNG specific compensation and enhancement measures. The Applicant is committed to achieving a positive net gain in biodiversity as measured using the BNG metric 3.0. **Appendix 20.6 Initial Biodiversity Net Gain Assessment** (document reference 6.3.20.6). There are widespread opportunities for enhancement of habitats throughout the DCO order limits, although many of these will require agreement with landowners. Where relevant, these opportunities are presented in **Appendix 20.6 Initial Biodiversity Net Gain Assessment** (document reference 6.3.20.6) and include improved management of retained habitats to improve condition and replacing removed habitats with higher distinctiveness (such as creation of other neutral grassland in place of removed modified grassland).

			The Initial Biodiversity Net Gain Assessment will be refined post-consent and pre-construction and once detailed design has been completed.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.6.1.8 Comment As the final cable corridor route is yet to be defined, 'A detailed assessment of potential impacts on ponds is therefore not yet possible but will be provided at DCO application stage'. Recommendations Need to ensure loss/damage to ponds is fully assessed at DCO application stage, as is stated here.	No	No ponds will be lost or damaged during construction works.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.6.1.8.1	No	No ponds will be lost for the projects; however, a suite of great crested newt eDNA surveys have been undertaken. The findings of which have been used to submit

	Comment Of the 10 ponds permanently removed or damaged estimated within the RWCS, how many of these had GCN present? This would have an effect on the concluded impact significance. (This comment also links to Chapter 22.6.1.17 Impact 17, point 331).. Recommendations Related to the point made above – the RWCS here doesn't specify if the ponds estimated to be removed/damaged had GCN present/breeding, so NE cannot accurately assess the impact significance given. It is recommended that this is taken into consideration when fully assessed at DCO application stage.		and support a District Level Licence agreement to Natural England. Section 20.6.1 of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) presents the ecological impact assessment on great crested newts and the appropriate mitigation measures.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.6.1.11 Comment There is a mention of 'signal crayfish or crayfish plague which affect the native white-clawed crayfish' (point 272) – The River Wensum has native crayfish, so this needs to be considered	No	All watercourses within the DCO order limits were noted during the EP1HS and subsequently assessed for their suitability to support white clawed crayfish. A total of seven watercourses formed the basis of the white clawed crayfish eDNA survey undertaken in July 2021. Full survey results and methodology is provided in Appendix 20.9 White Clawed Crayfish Survey Report.

	here. Recommendations Full assessment needed once specific surveys (2021) for signal crayfish and crayfish plague have been conducted, so NE can make an informed assessment and comment if necessary. This will contribute towards the proposed INNS Management Plan.		The 2021 white clawed crayfish eDNA survey confirmed the likely absence of white clawed crayfish from six of the seven surveyed watercourses and confirmed presence in one: namely the River Tiffey. This watercourse will be crossed using HDD and therefore no direct impacts have been predicted and therefore no further mitigation measures have been identified for this species.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.6.1.12 Comment Badger presence/absence surveys being conducted 2021 (to cover the 30% of PEIR boundary not covered previously due to landowner restrictions) – NE will need to view results in order to make an informed comment on impacts.	No	A badger presence/absence survey was undertaken of areas within the DCO boundary where landowner access had been granted in 2020 and/or 2021. The findings of which are reported in **Appendix 20.14 Badger Confidential Appendix** (document reference 6.3.20.14) Through refinement of the onshore cable corridor, the majority of active badger setts have been avoided; however, one single sett will be

	Recommendations The Applicant needs to ensure that badger survey results are presented within the ES as stated.		subject to a badger mitigation licence application prior to construction. A draft badger mitigation licence has been prepared and issued to Natural England to obtain a LoNI. Due to the mobility of this species, pre-construction badger surveys will be undertaken, as presented in the **Outline Ecological Management Plan** (document number 9.19).
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.6.1.18 Comment 'no baseline fish surveys are planned to be undertaken' (point 341). The Applicant has stated the impact significance to be 'minor adverse' 'depending on the species present' (point 344).	No	Whilst no baseline survey for fish has been undertaken, information obtained from the Environment Agency has been used to inform the potential impacts and mitigation measures for fish. These are presented in Section 20.6.1.17 of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) and further discussed in the ES Chapter 18 Water Resources and Flood

	Recommendations There is currently insufficient information provided in Chapter 22 for Natural England to comment on the potential impact of water crossings on fish. We would expect any impacts to fish to be considered in the site species water crossing plans. Please confirm where the commitment to produce site specific water crossing plans is incorporated in the DEP and SEP application. If required by other interested parties, project specific data should be collected. There is the potential for the Applicant to deliver net gain. For example, at trenchless crossings where the Applicant has proposed to instate the channel at preconstruction depth, an aspiration could be included to improve the condition of the watercourse where possible - the Applicant could work collaboratively where river restoration projects have already taken place or been proposed.		Risk. It should also be noted that all main rivers will be crossed using HDD technologies. NE refer to site species water crossing plans; it is not intended that these are produced; however water course crossing method statements will be prepared and where appropriate to do so will include information/survey requirements/mitigation measures relating to species. NE agreed this approach at the ETG meeting held on the 1st July 2021.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.6.1.19 Comment ‘Targeted reptile presence/absence surveys will be undertaken	No	Any suitable reptile habitat within the DCO order limits has been surveyed for reptiles. 118. A total of 15 sites within the DCO order limits formed the basis of the reptile presence/absence surveys that were undertaken in April and/or May 2021. Reptile presence was confirmed at 11 of the 15 sites,

	in 2021 and the findings will be used to inform the EcIA and any necessary mitigation measures; these will be presented in the full ES'. Recommendations Ensure these reptile presence/abundance results are provided within the full ES.		where adder was recorded at two sites, common lizard was recorded at three sites, grass snake at five sites and slow worm at five sites. Four of the sites were found to support two reptile species each, with the other seven sites supporting a single species each. The numbers of animals recorded during the 2021 reptile surveys was generally low (fewer than five, which is indicative of a 'Low' population classification, in accordance with the industry accepted reptile guidance), although at one site bordering the A140 and railway line near the onshore substation, a 'Good' population of slow worms was recorded (with a maximum count of 10 adult animals during a single survey). Full reptile survey results are provided in **Appendix 20.8 Reptile Survey Report** (document reference 6.3.20.8).

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.7.3 Comment 'It should be noted that as baseline data collection is still ongoing at present, a full cumulative assessment has not been undertaken at this time. This will be reported fully once baseline data has been fully obtained and presented in the ES'. Recommendations A full cumulative assessment is needed once all survey data is completed – please ensure this is within the ES.	No	Full baseline results from all onshore ecology surveys undertaken to date are reported within standalone technical appendices to the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20). All publicly available information relating to any other projects/plans for the CIA has been reviewed and incorporated within the CIA presented in **Section 20.7** of **the ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) .
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 22 Onshore Ecology and Ornithology Section 22.7.3.2, 22.7.3.3 Comment Temporally and spatially overlapping impacts from projects listed has the potential for cumulative impacts on habitat types	No	All publicly available information relating to any other projects/plans for the CIA has been reviewed and incorporated within the CIA presented in **Section 20.7** of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20).

	such as arable fields and margins, hedgerows, woodland, and watercourses. 'There is potential for cumulative impacts on multiple protected and other priority species'. Cumulative impacts on habitats and species are very difficult to assess without having the final cable corridor defined. Recommendations Full cumulative impacts need to be reported within the ES as part of the DCO application, as mentioned. NE encourage the Applicant to work alongside other plans and projects for the enhancement proposals for species and habitats.		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.1 Extended Phase 1 Habitat Section 1. Comment (Link to comment above - 22.3.1) "65-70% of PEIR area has been surveyed" – a data search with the Norfolk Biodiversity Information Service obtained	No	Since the publication of the PEIR, the onshore ecological survey efforts have continued where landowner access has been granted. Approximately 90% of the area within the DCO boundary has been surveyed, with the remaining 10% having been assessed using the Norfolk Living Maps obtained from NBIS.

	habitat classifications within un-surveyed areas via the Norfolk Living Map. However, this doesn't include any details of protected or valued species signs, habitat suitability for such species, or presence of INNS. Recommendations (Reference to comment re. 22.3.1) The Applicant needs to ensure more surveying has been conducted as mentioned to fill the gaps noted. Wild Frontier Ecology have stated that 'Attempts to arrange access to survey these parts of the PEIR boundary are ongoing, and if access is obtained, they will be subject to EP1HS in 2021'.		Constraints and limitations encountered during the baseline ecological surveys undertaken to date are acknowledged and presented in the respective accompanying survey reports.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.1 Extended Phase 1 Habitat Section 4.1, Table 1 Comment (Linked to first comment - 22.3.1) The study scope area has been set as 'within and up to 2km from the PEIR boundary' for protected and notable species and bats. The following section (4.2.1) includes a desk-based review using Magic Map "for information on statutory sites and	No	**Section 20.3.1** of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) presents the study areas that have been identified and used to inform the ecological impact assessment. These study areas have been defined using professional judgement and in accordance with industry guidance. A desk-based review, including the obtaining of biological data records (for both habitats and species) from

	Priority Habitats within the PEIR boundary. It is unclear if this information involves the use of the Impact Risk Zone layer to inform the decision (as previously recommended by NE for Norfolk Boreas to cover consideration of foraging areas and supporting habitat, in addition to functionally linked land). NE notes that in the main chapter the text reads 'The comments relating to Paston Great Barn SAC relate to the eastern Bacton route which is no longer part of SEP and DEP proposal. However, further consultations for information on barbastelle bats within the refined PEIR boundary are ongoing'. Recommendations Clarification needed as to whether the Impact Risk Zone layer on Magic Map has been used to inform the decision of 'within and up to 2km from the PEIR boundary'? The Zones of Influence for the study areas should be determined by the designated sites and features of interest and potential impact pathways. We advise the Applicant to refer to Natural England's Impact Risk Zone for SSSI, available on Magic (Link). Setting the scope of the study area as 2km from designated sites is not sufficient to incorporate sites wide ranging mobile species for example, the study area for Alderford Common SSSI Barbastelle bats should cover foraging areas and supporting habitat.		NBIS, has been undertaken and the findings of which are presented in **Appendix 20.7 Onshore Ecology Desk Study** (document reference 6.3.20.7).

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.1 Extended Phase 1 Habitat Section 4.2.2 Comment Surveys ran in January 2021 due to a review of the landowner access situation. This covered land parcels within the PEIR boundary which had not been accessible for surveys in 2020. Unclear if this completely or partly resolves the comment raised in Chapter 22.3.1 Study Area, 9. Pg.36, regarding un-surveyed land, or if there is still un-surveyed land due to other reasons (e.g. redefined PEIR boundary)? Also, Natural England queries the timing of the January surveys as they are not within the standard best practice. Recommendations (Relates to comment raised in 22.3.1) Clarification on this matter is needed (potential discrepancy between main chapter and appendices?). Has all previously un-surveyed land within the (new) PEIR boundary now been conducted fully? Are there still gaps in the data following the 2021 surveys? Has standard CIEEM surveys been followed?	No	Since the publication of the PEIR, the onshore ecological survey efforts have continued where landowner access has been granted. Approximately 90% of the area within the DCO boundary has been surveyed, with the remaining 10% having been assessed using the Norfolk Living Maps obtained from NBIS. Ecological surveys have been completed by suitably qualified and, where relevant, licensed ecologists, at the appropriate times of year and in accordance with industry accepted guidance. Where any surveys have been completed outside of the optimal seasonal windows, this is listed in the Constraints sections of each Technical Appendix and is summarised in the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20).

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.1 Extended Phase 1 Habitat Section 4.4 Comment EP1HS recorded habitats on accessible land parcels within the former (mostly wider) PEIR boundary. Features were classified according to their total footprints within that boundary e.g. hedgerow classifications were based on all features of hedgerow within the relevant area (the same for other habitats such as grasslands and woodlands); there is a chance that some of these classifications are slightly inaccurate (post-PEIR boundary change). Is the surveying data being used to support the HRA, because this potential inaccuracy could have a knock-on effect? Recommendations Please could the Applicant clarify what is being done to address this concern.	No	Where relevant, information obtained from the 2020 and 2021 onshore ecology baseline surveys have been used to inform and support the onshore considerations within the HRA. Constraints and limitations encountered during the baseline ecological surveys undertaken to date are acknowledged and presented in the respective accompanying survey reports.

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.1 Extended Phase 1 Habitat Section 5.3 Comment NE has possible concerns for ancient woodland here as it is mentioned briefly in this section: 'In general, the PEIR boundary avoids woodland, with the boundary aligned around the edges of woodlands such as'...'Colton Wood (an ancient woodland in the CP of Marlingford and Colton) and Smeeth Wood (an ancient woodland in the CP of Ketteringham)' Recommendations 'The zones of influence for Ancient Woodland should be clearly stated. Consideration should be given to any edge effects and air quality impacts. We refer the Applicant to Natural England's standing advice for ancient woodland and the management of buffers (Link) and suggest these are incorporated into the OLEMS'.	No	Since the publication of the PEIR, further refinements have been made to the DCO boundary which has resulted in the avoidance of ancient woodland. There will remain individual trees in hedgerows that may be unavoidably lost. In addition, the projects have committed to use technical solutions to minimise the potential impacts, for example but not limited to the adoption of trenchless crossing methodologies at Weybourne Woods.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments	No	All watercourses within the DCO order limits were noted during the EP1HS and subsequently assessed

	Appendix 22.1 Extended Phase 1 Habitat Section 7.2.4 And 7.2.5 Comment Otter and water vole surveys being undertake in 2021 – please ensure this data is included in the Application. Recommendations Request otter and water vole data (2021) once surveying is complete. Please ensure there is sufficient to confirm presence/absence and any mitigation measures that may be required.		for their suitability to support water voles and/or otters. A total of 10 watercourses were assessed as providing optimal habitat for water voles and/or otters and therefore formed the basis of the 2021 presence/absence survey effort. Full survey results and methodology is provided in **Appendix 20.13 Riparian Mammals (Water Vole and Otter) Survey Report** (document reference 6.3.20.13). The 2021 surveys confirmed the presence of water vole in nine of the ten surveyed watercourses, with only the unnamed tributary of the River Yare at Furze Meadow showing no signs of water vole presence. Otter signs were found only at the River Tiffey.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments	No	Breeding bird surveys did not commence in March 2020 because landowner access was very limited

	Appendix 22.5 Breeding Bird Section 3.2 Comment Breeding bird 'Surveys were undertaken between April and July 2020' (sentence from section 3.2). The bird breeding season is stated as April to July here (for the 2020 year) but in section 4.6, Further Survey Requirements and Expiry Dates (Pg. 26), it states 'the breeding season (March to July 2021)' – NE question what the Applicant is classifying as the start of the breeding season-March or April? If it is March, will the Applicant be missing data for March 2020? Recommendations Please provide further clarification.		at that time, so surveys commenced in April 2020 from public rights of way. The breeding bird survey season is March to July, but surveys from April to July are still within the correct season and are acceptable. A suite of breeding bird surveys was undertaken in 2021 between April to June which is the peak breeding bird season. Full breeding bird survey results are presented in **Appendix 20.5 Breeding Birds Survey** (document reference 6.3.20.5).
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.5 Breeding Bird Section 1.Non- Technical Summary Comment Due to changes in the onshore cable corridor during the 2020 breeding bird survey effort, some areas were not surveyed on	No	A suite of breeding bird surveys was undertaken in 2021 between April to June which is the peak breeding bird season. Full breeding bird survey results are presented in **Appendix 20.5 Breeding Birds Survey** (document reference 6.3.20.5).

	all six breeding surveys ('most notably within the section to the north of Weybourne village, and within the Wensum and substation areas' – quotation from section 4.5 paragraph 2, page 26). These constraints will be addressed by conducting further bird surveys during the subsequent breeding season (in 2021). Limited landowner access resulted in areas receiving partial or no survey coverage. Recommendations The Applicant needs to ensure data for the 2021 breeding season (March to July) is included when surveying is complete, given the change in cable corridor and that surveys are no longer restricted to roads and PRoWs by gaining landowner access.		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.5 Breeding Bird Section 4.1. Comment The Weybourne to Plumstead section (10km buffer from NNC SPA) had reports of seven Red listed, six Amber listed and two Schedule 1 species (see Table 5). Skylarks – Red listed, (46 territories) found within arable fields.	No	Noted. Environmental Stewardship schemes (ESS) are discussed in the land use chapter, including mapping showing the extent of ESS.

	One yellow wagtail territory found in an arable field near Manor Farm House (near Baconsthorpe) – noted to be a rare (Red listed) breeder in North Norfolk. Recommendations Arable Land- there is no discussion on any Countryside Stewardship or Environmental Stewardship schemes agreements in place along the route. The Applicant must consult the Rural Payments Agency at the earliest opportunity to discuss the impacts to schemes. In addition, mitigation should be provided to ensure that species of conservation note are not unduly impacted by the projects		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.5 Breeding Bird Section Table 5 Comment Sand martin (breeding in cliffs at Weybourne) included in results table - addressed NE's previous comments (November 2019 Scoping Opinion comment 513):	No	Noted although Mundesley Cliffs has now been removed following further refinements made to the DCO boundary since the publication of the PEIR.

	'Mundesley Cliffs SSSI should be included... Sand martins nest in the cliffs although they are not listed as a designated feature'. Recommendations Issue here addressed, however, this 'relates to the previously proposed eastern route to Bacton, which no longer forms part of SEP and DEP proposal'.		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.4 Overwintering Bird Survey (General comment) Comment Mitigation measures to minimise the impacts to overwintering Annex I birds should be adopted for works undertaken with may overlap with severe weather conditions. Recommendations Severe Winter Weather scheme criteria should be clearly laid out in Environmental Management Plan for contractors.	No	A suite of over-wintering bird surveys has been undertaken across 2020 and 2021, the findings of which are reported in Appendix 20.4 Wintering Birds Survey. Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) **within Outline Ecological Management Plan** (document number 9.19).

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.4 Overwintering Bird Survey Section Table 1, section 4.1 Comment Table 1 = 'those qualifying species for adjacent SPA's and BoCC Red and Amber listed species likely to be present within the habitats along the scoping area. Also recorded were any Schedule 1 species such as kingfisher Alcedo atthis and barn owl Tyto alba and any particularly notable numbers of Green listed species'. A cross check conducted between the Designated Sites View advice on seasonality and the birds listed as target survey species within Table 1 in the report reveals that some birds designated for protected sites within the survey zones have not been surveyed for the winter period specified (between November and March). (Note: Some of them have been included during the NBIS Data Search – Table 2). North Norfolk Coast SPA: Dark-bellied brent goose (non-breeding) Knot, (non-breeding) Pink-footed goose (non-breeding)	No	A suite of over-wintering bird surveys has been undertaken across 2020 and 2021, the findings of which are reported in **Appendix 20.4 Wintering Birds Survey** (document reference 6.3.20.4). With reference to the listed bird species by Natural England, these would have been noted if present during the over-wintering bird survey efforts. A review of the desk-study and field survey data identified Knot as being the only species missing from the table of target species. This has been addressed in the over-wintering bird survey report (**Appendix 20.4 Wintering Birds Survey** (document reference 6.3.20.4)). However, to clarify the surveyors recorded all bird species seen during the survey effort.

	Wigeon (non-breeding) Broadland SPA: Bewick's swan (nb) Gadwall (nb) Shovler (nb) Whooper swan (nb) Wigeon (nb) Recommendations Why were some of these species not included in the ones listed as being targeted for Field Surveys (only listed as part of the NBIS Data Search), when they are listed as being features of the protected sites mentioned?		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.4 Overwintering Bird Survey Section Para 2 And Para 4 Comment 'No significant species of notable concentration were observed, although a flock of up to 3,500 pink-footed geese Anser brachyrynchus that was present within a harvested sugar beet field beet just south of Weybourne cliffs during the	No	**Section 20.6.1.14** of the ES **Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) presents the ecological impact assessment and mitigation measures in relation to PFG. Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within **Outline**

	November/December 2019 and January 2020 surveys (see Figure 4). This area is approximately 800m to the east of the refined PEIR boundary'. 'Pre-ground clearance works surveys will be necessary in order to locate any sensitive species such as pink-footed geese and avoid any potential disturbance and displacement impacts'. Please note the North Norfolk Coast SPA/Ramsar site, which pink-footed geese are a feature of, use neighbouring fields in the winter to forage and may be affected during the construction of the cable route. If construction works take place September-April, then some loss of feeding habitat and/or displacement of birds may take place depending on the location of sugar beet fields. Recommendations The Applicant has already proposed pre-clearance ground works here, which is good – however, we believe that it can be improved upon in relation to PFG NE advises that there should be a commitment to submit a pink-footed goose mitigation plan to Natural England in the 12 months prior to construction if works are proposed for the period November to January. Avoidance measures, such as timing or crop rotation should be considered first, as outlined in best practice of mitigation hierarchy. Advised that sugar beet is not planted in the season prior to construction in those fields		**Ecological Management Plan** (document number 9.19).

	within a 500m radius of the landfall and the cable route in areas known to be used by pink-footed geese.		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.4 Overwintering Bird Survey Section Para 3 Comment 'Due to the lack of coverage of the current PEIR boundary the River Wensum surveys recorded only a single target species, namely mute swan...' Limited landowner access was a constraint here too (like all other surveys), some areas with no coverage and others being part surveyed – 'the area around Kelling Heath Campsite, Weybourne Wood and the section of land bordering the River Wensum'. Additionally, 'coverage of the refined PEIR corridor is uneven with some sections receiving very little survey coverage, particularly within the Weybourne Village/coastal section, River Wensum and Onshore substation areas. This is reflected in the relatively low number of species recorded by the surveys and will be addressed during the subsequent survey period'. Recommendations	No	**Section 20.6.1.14** of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) presents the ecological impact assessment and mitigation measures in relation to PFG. Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within **Outline Ecological Management Plan** (document number 9.19).

	The Applicant has already proposed pre-clearance ground works here, which is good – however, we believe that it can be improved upon in relation to PFG NE advises that there should be a commitment to submit a pink-footed goose mitigation plan to Natural England in the 12 months prior to construction if works are proposed for the period November to January. Avoidance measures, such as timing or crop rotation should be considered first, as outlined in best practice of mitigation hierarchy. Advised that sugar beet is not planted in the season prior to construction in those fields within a 500m radius of the landfall and the cable route in areas known to be used by pink-footed geese.		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.4 Overwintering Bird Survey Section 5, Tables 4-6, 6. Comment Within the substation survey area, the following species were found: Fieldfare (red list) – total of 70 found (max count 70) Meadow pipit (Amber list) – total of 51 found (max count 50)	No	The decision as to what constitutes low or high numbers is the judgement of the professional ornithologist. In the case of fieldfare, flocks can be comprised of many hundreds of birds, so a flock of 800-1,000+ has been considered a large flock, whereas a flock of 70 has been considered a small flock, for this species. For meadow pipit, a flock of 50 birds is a moderate size flock, but given the infrequency with which this species was recorded throughout the DCO boundary

	Within the results conclusion paragraphs there is mention of this, however the Applicant is considering these numbers ('relating to Red and Amber listed farmland species') as low – NE query how it is being decided what is considered high and what is considered low? Recommendations NE request the Applicant include how they are deciding if a total count is low or high?		(covering areas in which flocks would be expected to occur more regularly than they were found to, based on habitat suitability), overall occurrence is judged to be low.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.3 Bat Activity Survey Section 1. Comment The proposed total area of the PEIR boundary has not been provided. This would be required to establish whether survey effort is appropriate and proportionate. Recommendations Please provide a finalised PEIR boundary including total area to be impacted.	No	Noted and full information relating to the onshore order limits is provided in the **ES chapter 4 Project Description** (document reference 6.1.4). This formed the basis of the onshore ecological survey areas.

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.3 Bat Activity Survey Section 3.1 Comment It is stated that the static bat detector surveys were used to identify bat usage of areas considered to be of importance for foraging and commuting within the current PEIR boundary. Recommendations This survey method alone is not usually considered sufficient to understand foraging and commuting activity due to a lack of qualitative data, i.e. it cannot be verified if the activity has multiple passes by small numbers of bats or singular passes by large numbers of individual bats. In addition, this method does not allow for full species identification for multiple species including Myotis species, and long-eared bats due to their quiet echolocation.	No	The static bat detectors do pick up calls by Myotis species and brown long-eared bat. It is acknowledged that these species' calls are quiet, but there are no type of bat survey which would be able to address this. These species (particularly Myotis) cannot reliably be identified by sight during transect surveys, especially given that the surveys take place in low light. Monthly activity transect surveys have been undertaken and the findings of which are presented in **Appendix 20.3 Bat (Activity) Survey Report** (document reference 6.3.20.3)These surveys have recorded where there are large numbers of bats or high number of bat passes. The transect surveys were able to visually pick up BLE bats, however the static bat detectors did not record this species due to this species having a quiet call.

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.3 Bat Activity Survey Section 3.1 Comment Currently the survey objectives do not detail consideration of impacts on potential bat roosts. Recommendations It is presumed roosting within structures and trees will be considered when the PEIR boundary has been finalised. Roosting surveys should consider all potential roost types including hibernation roosts.	No	All features (i.e. trees, buildings, structures) noted during the EP1HS were assessed in accordance with Bat Conservation Trust (BCT) guidance (Collins, 2016), from ground level and using binoculars, for their suitability to support roosting bats. A total of 13 trees with moderate bat roost potential were scoped in for nocturnal bat activity surveys that were undertaken in August and September 2021. These consisted of 12 oak trees and one ash tree. There were no trees with high bat roost potential within the DCO order limits which were likely to be impacted. Full details of the roost assessments and survey findings are presented in **Appendix 20.10 Bat (Roosting) Survey Report** (document reference 6.3.20.10). Confirmed bat roosts were recorded in seven of the 13 oak trees;

			however only two of the seven trees require removal. The removal of these two trees would be undertaken in accordance with a bat mitigation licence. A draft of which has been submitted to Natural England to obtain a LoNI.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.3 Bat Activity Survey Section 3.2.1 Comment It is stated that the decision regarding which areas warranted surveys was identified based on information provided in 'the ETG meeting' on the 28th January 2020. Recommendations It is recommended that the information used to make these decisions during this meeting is further explained to enable consideration of appropriateness by Natural England. From the above reference information Natural England have understood that the above approach is a judgemental static detector	No	A suite of monthly activity and deployment of static bat detectors were undertaken across 2020 and 2021. The findings of which are reported in **Appendix 20.3 Bat (Activity) Survey Report** (document reference 6.3.20.2). **Section 20.3.1.12** of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) presents the mitigation measures that will be adopted for foraging/commuting bats.

	sampling approach. The Bat Conservation Trust Good Practise Guidance (Collins, 2016) indicates judgement sampling has inherent uncertainty, and cannot be readily quantified. This would suggest that additional sampling techniques, e.g. transect surveys, would be necessary in 2021 to compliment the static detector surveys.		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.3 Bat Activity Survey Section 3.2.1 Comment Please note, in the above referenced report there are discrepancies in the figures, e.g. on page eight figure two is listed as 'eastern part of Weybourne Woods between Bodham and Weyboourne, however on page 15 figure two is the June to July overview map. Recommendations Editing error.	No	Noted. The findings of which are reported in **Appendix 20.3 Bat (Activity) Survey Report** (document reference 6.3.20.3.)
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.3 Bat Activity Survey	No	A suite of monthly activity and deployment of static bat detectors were undertaken across 2020 and 2021. The findings of which are

	Section 3.2.1 Comment As identified in the report no April-May static detector surveys were conducted, which limits understanding of how bats might be using the identified areas at the beginning of the bat active season. Recommendations It is recommended that April and May are surveyed to understand how bats might be using the sites during this period. In addition to this, static detectors were not continuously deployed at four locations: River Bure, Swannington, River Yare, and River Tiffey. This limits understanding of how bat use of these areas might change over the active period. It is recommended that surveys cover the whole bat period to understand how bats are using the sites.		reported in **Appendix 20.3 Bat (Activity) Survey Report** (document reference 6.3.20.2). To clarify the 2021 surveys have included April and May; however landowner access was limited in April (Weybourne Woods, which is one of the key targeted sites, was not accessible in April). The findings of the 2020 and 2021 surveys have been used to inform the ecological impact assessment presented in **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) .
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.3 Bat Activity Survey Section 3.2.2	No	Noted and whilst these limitations are acknowledged, suboptimal weather is an inherent part of bat surveys as it reflects real-world conditions. BCT survey guidelines (which are industry standard) do not specify that August-

	Comment During some of the static detector surveys in August-September and September -October the temperatures fell below 8°C, which may have reduced bat activity. It is also noted that Storm Ellen and Storm Francis occurred during the August-September surveys. Recommendations It is recommended that where possible further surveys are conducted to supplement data from periods lost due to adverse weather.		September/October static detector surveys (running over 5 consecutive nights, minimum) cannot take place during stormy or cool weather. Concentrating on short periods of optimal weather only would skew the results. The 2020 and 2021 surveys covered varying weather conditions which reflects the real-world conditions in which UK bats live. The findings of the 2020 and 2021 surveys have been used to inform the ecological impact assessment presented in **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20).
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.3 Bat Activity Survey Section 3.4	No	The scope of the bat activity surveys undertaken across 2020 and 2021 was informed by a review of the biological records data obtained from NBIS and also following a review of MAGIC.

	Comment In the Static bat detector report it is stated that: 'Records of significance were determined by the conservation status of the species 56. Species considered rare include noctules, Nathusius's Pipistrelle, whiskered bat Myotis mystacinus, western barbastelle, Leisler's bat and serotine. They were only included in the results where the location of the record was within approximately 50m of the PEIR boundary or well connected to the boundary via good quality habitat such as woodland and rivers.' Recommendations Given the mobile nature of bats the proposed 50m buffer referenced above will require further justification. Also, in addition to the search of the biological record centre, Natural England would advise consulting MAGIC to identify the presence of any protected species licence in the PEIR boundary, or within the zone of influence of the proposed development.		The findings of which are reported in **Appendix 20.3 Bat (Activity) Survey Report** (document reference 6.3.20.3). The findings of the 2020 and 2021 surveys have been used to inform the ecological impact assessment presented in **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20).
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.3 Bat Activity Survey Section 4.	No	Myotis species can only be reliably identified in the hand, such as by using mist-netting surveys (or DNA sampling of droppings from a roost site). Mist netting is considered to be excessive and cause undue

	Comment Myotis species were identified regularly during the static detector surveys. As identified in the report acoustic surveys are unable to identify Myotis to species level. Recommendations Additional survey effort should be conducted to identify which Myotis species are present and will be impacted by the proposed development.		disturbance to sensitive bat populations. A suite of monthly activity and deployment of static bat detectors were undertaken across 2020 and 2021. The findings of which are reported **Appendix 20.3 Bat (Activity) Survey Report** (document reference 6.3.20.3). It should also be noted that there is a commitment to cross the River Wensum and other sensitive habitats for bats using trenchless techniques, i.e. HDD and therefore indirect impacts on Myotis species are not predicted. Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within **Outline Ecological Management Plan** (document number 9.19).

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.3 Bat Activity Survey Section 4. Comment Whilst the current survey effort is considered incomplete, the surveys have identified the River Wensum to be of significance for commuting and foraging bats. Recommendations It is recommended this information be incorporated into the final route design to reduce potential impacts. This will be necessary when reviewing the No Satisfactory Alternative test.	No	A suite of monthly activity and deployment of static bat detectors were undertaken across 2020 and 2021. The findings of which are reported in **Appendix 20.3 Bat (Activity) Survey Report** (document reference 6.3.20.3). It should also be noted that there is a commitment to cross the River Wensum and other sensitive habitats for bats using trenchless techniques, i.e. HDD and therefore indirect impacts on Myotis species are not predicted. Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within **Outline Ecological Management Plan** (document number 9.19).

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.3 Bat Activity Survey Section 5.1 Comment 'The area around the River Wensum is considered to be important for barbastelles, so careful consideration must be given to the potential impacts on barbastelles using this area for foraging or possibly roosting.' Despite one of the survey locations being adjacent, there is no specific mention of the importance of Alderford Common SSSI which is in the vicinity mentioned above and provides a well-established roost, hibernaculum and feeding area. We note the lack of data for some 2020 surveys as some bat detectors failed to record due to technical issues. It is noted that the survey effort for 2020 was between June and October, so the start of the peak season for bat foraging/commuting (April and May) has not been covered. Recommendations 2021 surveys/report should include consideration to protected	No	The Norfolk Barbastelle Study Group (which focuses studies around the River Wensum and surrounding area, likely including Alderford Common) was consulted in January 2021 for advice relating to bats and the section from Brandiston/Swannington south to the A47, which includes the section passing east of Alderford Common. A suite of monthly activity and deployment of static bat detectors were undertaken across 2020 and 2021. The findings of which are reported in **Appendix 20.3 Bat (Activity) Survey Report** (document reference 6.3.20.3). Details relating to the pre, during and post construction mitigation measures for onshore ecology and ornithology receptors is presented (and will be secured through a DCO Requirement) within **Outline Ecological Management Plan** (document number 9.19).

	sites that have bats (e.g. Alderford Common SSSI) May and September 2021 survey results should be presented once complete. Also, it would be appropriate to collecting more data in areas where the bat detectors previously failed to record. It is stated that the time span of the 2020 survey (5/7 peak season months) should be sufficient to draw conclusions (section 4.6, paragraph 1 of the document). However, we believe that it would be beneficial if the 2021 surveys were able to include April and May also.		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.2 Great Crested Newt Survey Section Para 3 on page 4 Comment 'Refinement of the PEIR boundary in December 2020 reduced the number of ponds within the relevant area (i.e. inside the refined PEIR boundary and its surrounding 250 metres) to 179 ponds, 98 of which have been surveyed. Refinement of the PEIR boundary in December 2020 brought an additional 52 new ponds (which had not been surveyed in 2020) into the	No	A suite of great crested newt eDNA surveys have been undertaken. The full survey results are presented in **Appendix 20.2 Great Crested Newt Survey** (document reference 6.3.20.2). To confirm that no ponds will be lost as a result of the projects. Whilst there will be no ponds lost, there will be temporary short-term impacts on great crested newt terrestrial habitat. The Applicant has applied for a DLL scheme, and this will ensure compliance with the legal status of

	survey area; these ponds will be surveyed in 2021, assuming landowner access is permitted.' Recommendations Include results for the 2021 GCN pond surveys when available.		great crested newts and mitigate for the potential impacts on this species.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.2 Great Crested Newt Survey Section Para 6 on page 4 Comment There were many survey limitations for 2020; the ponds being dry, removed, unsafe to access or having other constraints which prevented water samples being taken. For other ponds, landowner access was not granted at the time of the surveys. Recommendations Perhaps some of these ponds will now be accessible for eDNA surveying (during 2021, e.g. as there has been more time to secure landowner access, previously dry ponds now containing water etc). NE request updated data (for the April-June 2021 study period).	No	Noted and where suitable ponds were not surveyed in 2020, they have been surveyed, where landowner access was granted, in 2021. Full results from **Appendix 20.2 Great Crested Newt Survey** (document reference 6.3.20.2) which accompanies the ES.

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.2 Great Crested Newt Survey Section Para 4 & 5 on page 5 Comment 'Further surveys would also be required to inform any European Protected Species (EPS) licensed mitigation'. 'An alternative approach to any necessary licensed mitigation could involve the DEP and SEP achieving a District Level Licence (DLL). However, the PEIR boundary partly overlaps a DLL 'Red zone' around Upgate near Swannington; this may prohibit DLL as a viable option for DEP and SEP, but this will be confirmed through consultation with Natural England'. Recommendations Discussion is encouraged regarding protected species licencing and mitigation.		The Applicant has applied for a DLL scheme, and this will ensure compliance with the legal status of great crested newts and mitigate for the potential impacts on this species.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.2 Great Crested Newt Survey	No	The Applicant is not aware of any known way of quantifying the accuracy of eDNA sampling. However, a suite of great crested newt eDNA surveys have been

	Section Table 1 And 4.3. Paragraph 3 on page 33 Comment Within table 1 there are several ponds listed as excellent (HSI Classification) but have returned a negative eDNA result. However, it is mentioned (in constraints and limitations section) that eDNA surveys could have returned false negatives due to restricted access to ponds (e.g. steep banks, fences, etc) meaning the water sampled not being collected from areas used by GCN. Additionally, within the table there is note of four incorrect pond references re SureScreen data returned. Recommendations Is there a way the Applicant could quantify the accuracy of the eDNA results? As suggested within the Appendix itself: [NE recommend that] surveyors note down the 4-digit unique reference code of the sample kit used at each pond – for any future (2021) surveying to prevent further inconsistencies in pond referencing.		undertaken and the findings of which are presented in **Appendix 20.2 Great Crested Newt Survey** (document reference 6.3.20.2). All surveys have been undertaken by suitably qualified and licenced ecologists, in accordance with industry accepted guidance and at the appropriate time of year. The Applicant has applied for a DLL scheme, and this will ensure compliance with the legal status of great crested newts and mitigate for the potential impacts on this species.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.2 Great Crested Newt Survey	No	Noted and to be considered by the project team. No further action required at this time.

	Section Annex 2 Comment The letter from the pond restoration group highlights their concerns re. the cable route: 'Given our major interest in Norfolk farmland ponds and in the network of hedges, woodland and meadows that form important corridors and connections between ponds that will be damaged and compromised by the cable works and in particular given the proximity of the Equinor cable route to our two major pond restoration areas at Bodham and Heydon we are obviously very concerned regarding potential impacts'. The table on the following page displays data where GCNs are known to be breeding (egg presence). Recommendations There is mention of the pond restoration group continuing their monitoring over the following years. It would be beneficial if any data could be incorporated into the application.		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.7 Onshore Ecology Desk Study	No	A desk-based review, including the obtaining of biological data records from NBIS, has been undertaken and the findings of which are presented **in Appendix 20.7**

	Section Executive Summary Comment There are a further 10 statutory designated nature conservation sites within 2km of the PEIR boundary (excluding offshore designations), including one site (North Norfolk Coast) designated as a Ramsar site, SAC, Special Protection Area (SPA) and SSSI, another six sites designated as SSSIs and three sites designated as Local Nature Reserves (LNR). Although these sites are viewable within Figures 1-10, it would be useful to have all these sites listed (like the Applicant has done for all statutory and non-statutory sites within the PEIR boundary. Recommendations NE recommends the Applicant lists all of the statutory designated nature conservation sites within 2km of the PEIR boundary, as the Applicant has done for the non-statutory sites. The potential impact pathways for each site should be specified.		**Onshore Ecology Desk Study** (document reference 6.3.20.7). Section 20.3.1 of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20) presents the study areas that have been identified and used to inform the ecological impact assessment. These study areas have been defined using professional judgement and in accordance with industry guidance.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.7 Onshore Ecology Desk Study	No	The Norfolk Barbastelle Study Group has been consulted but no response had been received. However, biological records from NBIS and a check of MAGIC has

	Section 2.3 Comment Records from the Norfolk Barbastelle Study Group have not been provided. Relates to previous comment from NE (November 2019 Scoping Opinion comment 530): 'Table 3.9 European designated sites within 20km - Paston Great Barn SAC is not the only known barbastelle maternity roost in Norfolk. It was when the site was designated. The Norfolk Barbastelle Study Group be approached for data' Recommendations We advise that evidence is presented to demonstrate that all data sources including from the Norfolk Barbastelle Study Group have been taken into account, and if not why not.		been undertaken to inform the ecological impact assessment presented in the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20).
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.7 Onshore Ecology Desk Study Section 2.3 Comment	No	The ARCT was closed during the 2020 Covid-19 lockdown and therefore data was unable to be obtained. Further contact has been made but advised that data searches are currently not being responded to. The ARCT was reconsulted in 2021;

	No biological records provided for amphibians and reptiles from the Amphibian and Reptile Conservation Trust due to being closed during Covid-19 and is currently not responding to biological record requests. This additional data may provide further insight into key areas within/near the PEIR boundary that need considering. Recommendations Please see above request.		however, no response has been received.
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.7 Onshore Ecology Desk Study Section 3.3.1. Table 5 Comment Data within Table 5 could be used to identify areas where measures such as the clean-check-dry protocol needs to be implemented for crayfish (re. INNS). Recommendations We suggest that data from the Norfolk Crayfish Group (in addition to the information gathered during the Extended Phase 1 Habitat Survey – Appendix 22.1) is used to identify	No	Noted. The EP1HS recorded only Himalayan balsam within and around the DCO order limits, namely one location along the banks of an unnamed stream which is a tributary of the River Wensum and the second location being along the banks of the River Bure. Prior to the commencement of construction works within these locations, appropriate INNS mitigation measures will be adopted. These are detailed within **Section 20.3.1.9** of the **ES Chapter 20**

	key areas where INNS mitigation measures need to be implemented.		**Onshore Ecology and Ornithology (document reference** 6.1.20).
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 22.6 Outline Biodiversity Net Gain Strategy (General comment) Comment NE's previous comment from Boreas has been taken into consideration here as the Applicant has included a Biodiversity Net Gain Strategy for Dudgeon & Sheringham Shoal. Relevant quotes from main chapter: 'Once the precise details of SEP and DEP are finalised (and all relevant ecological data has been collated), detailed mitigation proposals will be provided, including a commitment to achieve a 10% net gain using the BNG metric' 'An Outline Landscape and Ecological Management Strategy that will be submitted as part of the final DCO application. This will include proposals to reinstate and where possible enhance habitats such as hedgerows and grassland areas impacted by	No	Biodiversity Net Gain (BNG) has been considered separately as a stand-alone evaluation of the overall biodiversity impact of SEP and DEP, using the defined BNG metric (3.0) and incorporating BNG specific compensation and enhancement measures. The Applicant is committed to achieving a positive net gain in biodiversity as presented in **Appendix 20.6 Initial Biodiversity Net Gain Assessment** (document reference 6.3.20.6). There are widespread opportunities for enhancement of habitats throughout the DCO order limits, although many of these will require agreement with landowners. Where relevant, these opportunities are presented in **Appendix 20.6 Initial Biodiversity Net Gain Assessment** (document reference

	DEP and SEP'. Recommendations Ensure OLEMS and mitigation is all updated with BNG details following survey updates and finalisation of cable route. Consideration needs to be given as to how these will be secured in the DCO.		6.3.20.6). and include improved management of retained habitats to improve condition and replacing removed habitats with higher distinctiveness (such as creation of other neutral grassland in place of removed modified grassland). The Initial Biodiversity Net Gain Assessment will be refined post-consent and pre-construction and once detailed design has been completed.
Natural England	Table 9.2 – Greater Crested Newt (GCN) Additional Comments Appendix 22.2 Great Crested Newt Survey General Comment The total area and layout of the PEIR boundary has not yet been provided in an impact map. Recommendations If a licence is pursued, it is recommended that the Applicant include this, as Natural England's Wildlife Licensing Service will only be able to comment fully on the proportionality and	No	A suite of great crested newt eDNA surveys have been undertaken and the findings of which are presented in **Appendix 20.2 Great Crested Newt Survey** (document reference 6.3.20.2). All surveys have been undertaken by suitably qualified and licenced ecologists, in accordance with industry accepted guidance and at the appropriate time of year. The Applicant has applied for a DLL

	appropriateness of the current survey effort when this is available. For this reason, the advice below cannot cover proportionality or fully advise as to the appropriateness of survey for a licensing application at this stage.		scheme, and this will ensure compliance with the legal status of great crested newts and mitigate for the potential impacts on this species.
Natural England	Table 9.2 – Greater Crested Newt (GCN) Additional Comments Appendix 22.2 Great Crested Newt Survey Section 3 Comment Presence/absence surveys within the report combine HSI scoring, eDNA, desk based survey, and previous/ collaborators' records. Recommendations In addition to the search of the biological record centre, Natural England advise consulting MAGIC to identify the presence of any protected species licence in the PEIR boundary, or within the zone of influence of the proposed development.	No	The onshore ecology desk-based study reviewed all records for great crested newts that had been provided by NBIS, in combination with a review of MAGIC. A suite of great crested newt eDNA surveys have been undertaken and the findings of which are presented in **Appendix 20.2 Great Crested Newt Survey**.(document reference 6.3.20.2) All surveys have been undertaken by suitably qualified and licenced ecologists, in accordance with industry accepted guidance and at the appropriate time of year. The Applicant has applied for a DLL

			scheme, and this will ensure compliance with the legal status of great crested newts and mitigate for the potential impacts on this species.
Natural England	Table 9.2 – Greater Crested Newt (GCN) Additional Comments Appendix 22.2 Great Crested Newt Survey Section 3 Comment Following these survey methods, a number of potential metapopulations have been identified. This information and these results are deemed appropriate to feed into scheme design at this stage. Recommendations The current survey results could be used to inform whether any route options avoiding protected species impacts are possible, which may reduce the need for an individual GCN mitigation licence. If total protected species avoidance is not possible, this information can feed into the reasoned statement to be submitted with an individual licence application in order to	No	A suite of great crested newt eDNA surveys have been undertaken and the findings of which are presented in **Appendix 20.2 Great Crested Newt Survey**.(document reference 6.3.20.2) The Applicant has applied for a DLL scheme, and this will ensure compliance with the legal status of great crested newts and mitigate for the potential impacts on this species.

	satisfy the “no satisfactory alternative” test. To satisfy this test, the scheme must demonstrate which alternative scheme designs, protected species avoidance has been considered, and why these were not considered satisfactory alternatives in this instance.		
Natural England	Table 9.2 – Greater Crested Newt (GCN) Additional Comments Appendix 22.2 Great Crested Newt Survey Section 3.1 Comment It is noted that there are some ponds that have been excluded due to being denied access by a landowner. Recommendations The Applicant is advised to maintain written evidence of this, as Natural England may require written evidence (e.g. supporting documents like a paper trail showing what attempts were made to gain access) to be provided in support of an individual licence application, which can typically be appended to the method statement.	No	Noted and evidence relating to instances where landowner access was not granted in 2020 and/or 2021 has been collated and provided to NE.
Natural England	Table 9.2 – Greater Crested Newt (GCN) Additional Comments Appendix 22.2 Great Crested Newt Survey		A suite of great crested newt eDNA surveys have been undertaken and the findings of which are presented

	Section 4.4 Comment The survey report states that an individual mitigation licence for GCN may be considered above DLL due to the proximity of the scheme to the DLL red zone. Recommendations If the Applicant does pursue an individual GCN licence, the scheme should consider impacts to any ponds within 500m of the development footprint that meet all the following conditions: · maps, aerial photos, walk-over surveys or other data indicate that the pond(s) has potential to support a large great crested newt population · the footprint contains particularly favourable habitat, especially if it constitutes the majority available locally · the development would have a substantial negative effect on that habitat · there is an absence of dispersal barriers.		in Appendix 20.2 Great Crested Newt Survey. The Applicant has applied for a DLL scheme, and this will ensure compliance with the legal status of great crested newts and mitigate for the potential impacts on this species.
Natural England	Table 9.2 – Greater Crested Newt (GCN) Additional Comments Appendix 22.2 Great Crested Newt Survey Section 4.4	No	This comment assumes a 500m survey zone for great crested newt as this can be the standard survey area for a mitigation licence. However, this distance is considered to be irrelevant given the

	Comment NE note that some ponds may be excluded from the survey effort even if they fall within 500m of the development boundary, should there be a clear ecological justification as to why GCN will likely not be present in this area E.g. clear barriers to dispersal. Recommendations If this is the case, the ecological justification will need to be provided in support of an individual licensing application to explain why ponds within 500m of the development have been excluded from the survey. NE cannot comment on which specific waterbodies should be included in the survey effort. If any additional survey effort is required in light of the 500m impact zone, the scheme may wish to include this survey extent in their 2021 surveys, or consider further survey after the scheme design has been confirmed, and DCO approval has been obtained. If an individual licence application is pursued, the scheme should determine the population size class of any GCN populations that may be impacted, in order to build their mitigation proposals appropriately according to this. Any ponds within 500m of the development footprint with likely GCN presence should have an indication of population size class, which should be determined according to the best practice		Applicant has sought a DLL.

	guidance for surveys available in the Great Crested Newt Mitigation Guidelines. In certain circumstances, licensing policies may be applicable to a scheme. It is within the Applicant's discretion to consider whether they would like to form an individual licence application around a licensing policy. If the Applicant is considering use of a licensing policy, they may wish to pursue further advice under the current DAS contract in order to tailor this appropriately.		

19 Onshore Archaeology and Cultural Heritage

Consultee	Comment	Development Change?	Response
Historic England	Route refinement and micro-siting of the cable within the corridor should also be adopted as the preferred mitigation measure for non-designated heritage assets.	No	All baseline surveys have informed the route refinement process. Known and potential heritage assets (both designated and non-designated) have been avoided where possible. Approach adopted as set out in **Section 21.3.3** of **ES Chapter 21 Onshore Archaeology and Cultural Heritage** (document reference 6.1.21).
Historic England	We recommend that consideration is given to alternative techniques, such as electromagnetism and/or geoarchaeological approaches for parts of the scheme that cross wetlands, where magnetometry is less successful.	No	Approaches to alternative geophysical techniques and geoarchaeological approaches are considered in the **Outline WSI (Onshore)** (document reference 9.21).

Historic England	The assessment of historic cartography presented in Appendix 23.2 is limited to nineteenth century enclosure and tithe maps and Ordnance Survey maps. However, eighteenth century and earlier maps are available for some parts of the study areas.	No	The Aerial Photographic, LiDAR and Map Regression Analysis includes a review of available eighteenth century and earlier maps. This is presented in **ES Appendix 21.2 Aerial Photographic, LiDAR Data and Historic Map Regression Analysis** (document reference 6.3.21.2).
Historic England	We cannot see any further discussion of the coastal designated heritage assets in the main part of Appendix 23.3. The setting assessment needs to be used to inform the siting of any above ground infrastructure such as the substation at the options appraisal stage. We would also suggest an additional viewpoint from Mangreen Lane looking south towards the Grade II* listed Gowthorpe Manor and the proposed substation site.	No	The offshore infrastructure setting assessment is presented in **ES Appendix 21.5 Offshore Infrastructure Setting Assessment** (document reference 6.3.21.5), with the onshore substation setting assessment presented in **ES Appendix 21.4 Onshore Substation Setting Assessment** (document reference 6.3.21.2). The findings of the setting assessment informed the siting of the onshore substation.

			Additional viewpoint discussed with Historic England at ETG Meeting 4 (August 2021), and agreed it wasn't required.
Historic England	Given the high archaeological potential of the PEIR boundary, Historic England has concerns about the proposal to carry out all trial trenching investigations at the post-consent stage. We consider that this approach presents significant risks to both the historic environment and the delivery of the Project.	No	The Applicant understands and acknowledges the potential risks to the historic environment and delivery of SEP and DEP. A commitment to undertaking trial trenching in a timely manner is set out in the **Outline WSI (Onshore)** (document reference 9.21).
Historic England	It is worth highlighting that not all types of below ground archaeological heritage assets are conducive to detection through geophysical survey and aerial photographic and LiDAR analysis. We recommend that the archaeological finds data within the PEIR boundary is further reviewed to identify the potential for associated buried archaeological remains, and that potentially important locations are subject to pre-application intrusive surveys so that the results can inform the route refinement process.	No	Full details of the historic environment baseline are presented in the ADBA (**ES Appendix 21.1 Onshore Archaeological Desk-Based (Baseline) Assessment** (document reference 6.3.21.1) and potentially important locations requiring evaluation and further mitigation is presented in the **Outline WSI (Onshore)** (document reference 9.21).

Historic England	Assessment of which landscape zones different types and periods of heritage assets are, and are not, currently known to be located is likely to provide a more detailed understanding of the archaeological potential of the study area and inform the design of further investigations and mitigation measures.	No	A detailed baseline is presented within the ADBA (**Appendix 21.1 Onshore Archaeological Desk-Based (Baseline) Assessment** (document reference 6.3.21.1)) and summarised in **Section 21.5** of **ES Chapter 21 Onshore Archaeology and Cultural Heritage** (document reference 6.1.21).
Historic England	We recommend that the Historic England document 'Preserving Archaeological Remains' (2016) is referred to as this document sets out how impacts such as changes to groundwater levels and the preservation of archaeological sites can be investigated. We consider that the proximity of this medieval moated site (List Entry Number 1013097) to the cable corridor means that there may be potential for adverse impact on any waterlogged deposits and preserved organic remains. We recommend that this is given further consideration and that the statement in Section 23.6.1.3 (paragraph 200) that 'Indirect impacts to designated heritage assets are not anticipated to occur' is reviewed and amended.	No	Potential hydrological changes to heritage assets have been reviewed and further assessed; details of which are presented in **Section 21.6** of **ES Chapter 21 Onshore Archaeology and Cultural Heritage** (document reference 6.1.21).

Historic England	In terms of potential indirect (physical) impacts we wish to highlight that the potential for the buried cables to emit heat needs to be considered, particularly for wetland areas where waterlogged deposits/organic archaeological remains may be preserved. Heat could dry out these deposits which in turn could damage or destroy vulnerable buried archaeological remains.	No	Archaeological and geoarchaeological monitoring undertaken on GI works to date have highlighted areas of potential indirect (physical) impacts. The details of which are presented in **ES Appendix 21.7 Archaeological and Geoarchaeological Monitoring Assessment** and assessed in **Section 21.6** of **ES Chapter 21 Onshore Archaeology and Cultural Heritage** (document reference 6.1.21).
Historic England	Historic parish boundaries and hundred boundaries should be identified, in conjunction with the historic map regression work and considered for further investigation and mitigation measures. Where linear earthworks such as hedgerow banks are present on historic parish and hundred boundaries direct physical impact on these should be identified and avoided. Where impact will occur, mitigation should include recording the profile of any earthwork and sub-surface features with appropriate reinstatement of earthworks following construction activities.	No	Identification of historic parish boundaries and hundred boundaries are presented in **ES Appendix 21.2 Aerial Photographic, LiDAR Data and Historic Map Regression Analysis** (document reference 6.3.21.2). Details of mitigation are presented in the **Outline WSI (Onshore)** (document reference 9.21).

Historic England	We recommend that the potential for buried archaeological remains at the landfall location is subject to intrusive investigations (including geotechnical/geoarchaeological assessment) prior to DCO submission to assess the impact of HDD works as well as the surface/shallow depth impacts.	No	The archaeological and geoarchaeological monitoring of GI works is presented in **ES Appendix 21.7 Archaeological and Geoarchaeological Monitoring Assessment** (document reference 6.3.21.8).
Historic England	With regards to the potential impacts of the HDD works, both at the landfall location and any inland river/road crossings, we wish to highlight the potential for direct impact on buried archaeological remains through bentonite slurry break-out. We request that this potential impact is given appropriate consideration.	No	Potential direct impacts from bentonite slurry break-out has been considered further and is discussed in **Section 21.6.1** of **ES Chapter 21 Onshore Archaeology and Cultural Heritage** (document reference 6.1.21).

Norfolk County Council (NCC)	A number of the priority areas for geophysical survey were not surveyed due to crop conditions and other access issues. We strongly advise the applicants to extend the geophysical survey into these areas, and indeed the rest of application corridor at the earliest possible opportunity regardless of what stage the EIA/NSIP application has reached.	No	Where possible, further geophysical survey has been undertaken; the results of which are presented in full in **ES Appendix 21.6 Priority Archaeological Geophysical Survey** (document reference 6.3.21.7). These results have further informed **Section 21.6** of **ES Chapter 21 Onshore Archaeology and Cultural Heritage** (document reference 6.1.21) and the **Outline WSI (Onshore)** (document reference 9.21).
NCC	We note that Geoarchaeological desk-based review, including assessment of potential for Palaeolithic archaeology is yet to be undertaken. We appreciate there may be good reasons for this, for instance waiting for the results of GI works. We seek to gently remind the applicants about this aspect of the onshore archaeology.	No	Details of the archaeological and geoarchaeological monitoring of GI works is presented in **ES Appendix 21.7 Archaeological and Geoarchaeological Monitoring Assessment** (document reference 6.3.21.8). This has informed the initial informative stage of mitigation and further mitigation stage presented in the **Outline WSI (Onshore)** (document reference 9.21).

20 Air Quality

Consultee	Comment	Development Change?	Response
NNDC	Chapter 24 - Air Quality The contents of this chapter are noted together with the technical appendices. These issues have not been considered in detail by NNDC at this time but, in the main the most likely air quality impact will arise from transport and construction activities. NNDC would wish to work with Equinor in the preparation of any Outline Codes of Construction Practice and Outline Traffic Management Plans which can help avoid, or mitigate and potential adverse air quality impacts.	No	Noted. The assessment of construction phase impacts is provided in **Section 22.6.1** of **ES Chapter 22 Air Quality** (document reference 6.1.22). Any mitigation measures recommended in this chapter will be included in the **Outline Code of Construction Practice (oCoCP)** (document reference 9.17). Control measures and monitoring procedures for managing the potential traffic and transport impacts during the construction of SEP and DEP are detailed in **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) and will be included in an **outline Construction Traffic Management Plan** (OCTMP) (document reference (9.16). The OCTMP will be developed further in consultation with Norfolk County Council (NCC) and National Highways prior to the commencement of the authorised Project.

Natural England	Section Chapter 24. Table 24-1: Vs. Chapter 24.3.1 Vs. Appendix 24.4 Comment Study Area, in relation to dust and particulate matter – confusion as to if 50m or 200m has been used. Previous paragraph (on page 15) states 'designated ecological sites within 200m of the road network', however, (on page 18) it now states 'within 50m of routes used by construction vehicles'. It seems the Applicant has taken NE's previous advice for 200m (not 50m) for the distance from construction works, but then changed the distance from 200m to 50m from the road network. (The same comment can be raised for point 131 on page 69) *'A number of designated ecological sites are located within 200m of roads which are anticipated to experience increases in construction-related traffic flows above the criteria detailed...'* Perhaps there are just discrepancies within the text, as in appendix 24.4 it states that sites 200m from roads have been considered (point 1, page 5). Recommendations	No	The construction dust and particulate matter assessment presented in this chapter (see **Section 22.6.1.1** of **ES Chapter 22 Air Quality** (document reference 6.1.22) has considered ecological sites within 200m of construction activities within the red line boundary (as per Natural England internal guidance) and ecological sites within 50m of the road network up to 500m from the red line boundary (as per IAQM 'Guidance on the assessment of dust from demolition and construction' (2016)). The distance of 50m considered for dust and particulate matter from construction vehicle trackout *"takes account of the exponential decline in both airborne concentrations and the rate of deposition with distance"* (IAQM, 2016).

	Overall, clarification is needed here as to if the points raised are just discrepancies within the text, or if the Applicant needs to consider 200m from the road and not 50m. A rationale should be provide if 50m has been decided upon rather than 200m from the vehicle routes. Please amend text within documents to ensure consistency.		The construction road traffic emissions assessment has considered all ecological receptors within 200m of the affected road network, as per Highways England 'DMRB LA105 Air Quality' (2019), IAQM 'A guide to the assessment of air quality impacts on designated nature conservation sites' (2020) and 'Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations' (2018) guidance and has applied Decision-making Thresholds (DMTs) as per the recently released Joint Nature Conservation Committee (JNCC) reports (Chapman & Kite, 2021a and 2021b). Details of the ecological assessment methodology are provided in **Section 22.4.3.3.6** of **ES Chapter 22 Air Quality** (document reference 6.1.22).

			The mitigation measures recommended from the construction dust and particulate matter assessment (see **Section 22.6.1.1.5** of **ES Chapter 22 Air Quality** (document reference 6.1.22) are based on a worst-case assessment of the closest sensitive ecological sites to the highest magnitude of dust and particulate matter-generating construction activities, and therefore the assessment is considered conservative. In addition, these mitigation measures, based on the worst-case area, are recommended to be applied across the construction of the project and are therefore considered to be robust.

	Section 24.4.3.3.7 Comment Various diffusion tube locations are discounted from the verification process, therefore 4 of the 9 original locations are used. Recommendations Please provide further justification that this remains sufficient for model verification.	No	The verification year has been updated from 2018 to 2019 for the ES, and the monitoring locations and data for each local authority in 2019 have been reviewed and the verification process updated. It has been clearly stated within this chapter (see **Section 22.4.3.3.5** of **ES Chapter 22 Air Quality** (document reference 6.1.22)). which diffusion tubes have been used and the reasons for their inclusion/exclusion. A base year of 2019 was used in the assessment as it was considered that it would be difficult to model representative conditions of a 2020 baseline, due to the Covid-19 outbreak in March 2020, i.e. it would be difficult to represent short or longer term impacts on emissions in 2020 as a result of behavioural changes during national or local lockdowns.

	Section 24.5.1. Comment Natural England queries the justification provided to rule out any significant increase in pollutant concentrations at distances of 400m, 1km and 1.6km from the Air Quality Management Areas (AQMAs). Recommendations Please provide further justification.	No	**Section 22.5.1** of **ES Chapter 22 Air Quality** (document reference 6.1.22) refers to the potential impact of the project on AQMAs. It is stated that, due to the distance of the AQMAs from roads on which project-generated traffic would travel, there is not expected to be any significant impacts on the AQMAs, which are designated based on exceedances of the human health-related air quality Objectives. This is because concentrations of pollutants emitted from road traffic sources decreases rapidly with distance back from the road. As such, at the cited distances, it is not expected that significant impacts would occur.

			Impacts as a result of road traffic emissions during construction of SEP and/or DEP on designated ecological sites have been considered on designated sites within 200m of the affected road network, in accordance with the following guidance: Institute of Air Quality Management (IAQM) 'A guide to the assessment of air quality impacts on designated nature conservation sites' (2020), 'Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations' (2018) and Highways England 'LA105 Air Quality' (2019).
	Section 24.5.4.1.2 Table 24- 26 And point 182. And Table 24- 45, And Point 223 Comment River Wensum SSSI and Colton Wood ancient woodland within or 0m from PEIR boundary – re. sensitive to dust impacts Code of Construction Practice (CoCP) will be submitted at ES stage (point 182. On page 92). Mentions the development and implementation of a 'Dust Management Plan'	No	Designated ecological sites have been considered in both construction dust and construction road traffic emissions assessments. Any recommended mitigation measures presented in this chapter will be included in the **oCoCP** (document reference 9.17) or Dust Management Plan, where relevant.

	Table 24-45, page 138, impact 3 (Construction road vehicle exhaust emissions) on designated ecological sties to be assessed at ES stage. *'In-combination increases in nutrient nitrogen and acid deposition and NOx concentrations may also cumulatively affect designated sites'.* Recommendations Please ensure that the designated ecological sites (detailed in appendix 24.4) and associated critical load values are considered at the ES stage, as stated within text. Natural England advises the Applicant to include commitments within the Outline Traffic Management Plan, CoCP and Schedule of Mitigation to include mitigation to reduce, wherever possible, impacts to designated sites. If there is likely to be an effect on a designated feature, the OLEMS should include mitigation measures to reduce changes in air quality, e.g. using efficient vehicles, reducing number of vehicles/time on the road, timing of construction to support biodiversity, possible use of barriers etc.		An in-combination assessment has been undertaken (see **Sections 22.4.3.3.6** and **22.6.1.3** of **ES Chapter 22 Air Quality** (document reference 6.1.22), and a search of local planning authority (LPA) planning portals has been undertaken to determine if there are any projects of relevance (as per the Sites of Special Scientific Interest (SSSIs) Impact Risk Zones (IRZs) (Natural England, 2021) which could potentially have adverse impacts in-combination with SEP and/or DEP. If in-combination projects fitting the criteria and sufficient information has been provided in the submission (i.e. detailed air dispersion modelling results), the impacts of these projects has been included and considered in this chapter.

			The ecological sites considered in the road traffic emissions assessment are detailed in **Table 22-34** of **ES Chapter 22 Air Quality** (document reference 6.1.22). Critical Load values for these sites are provided in **ES Appendix 22.4 Designated Ecological Sites and Critical Load Values in the Air Quality Study Area** (document reference 6.3.22.4).
	Section 24.7.3 Comment Assessing cumulative impact: The reasoning given for no significant impact for the 5 other plans and projects is that each one will have their own best practice mitigation in place. However, it is not clear if the impacts will be fully mitigated to an acceptable level; therefore there is the potential for there still be cumulative impacts from the residual impacts. Recommendations Natural England encourage some communication between plans/projects to ensure mitigation covers all areas of concern.	No	The CIA is presented in **Section 22.7** of **ES Chapter 24 Air Quality** (document reference 6.1.24).

	Appendix 24.4 – Designated Ecological Sites & Critical Load Values in the Air Quality Study Area Section: Table 24.4.1: Designated ecological sites and Critical Load values (pg 19) Comment Features of the River Wensum Special Area of Conservation (SAC) are noted to be sensitive to acidity and nutrient nitrogen on the Air Pollution Information System (APIS) website but noted to have no specified critical loads available due to being mainly 'P limited (or N/P co-limiting), therefore decisions should be taken at a site-specific level'. The Applicant has recorded it as N/A within the table which suggests that this site isn't sensitive, but provides no rationale for this statement. Also, there is no mention of Alderford Common SSSI within this table, despite being close to the PEIR boundary and noted on the APIS website as being sensitive to acidity and nutrient nitrogen. Again, there is no mention of Colton Wood Ancient Woodland named within the table (despite being close to the PEIR boundary in the chapters figures) Recommendations	No	Noted. As a result of further refinement of the traffic flow data for SEP and/or DEP between PEIR and ES, an updated screening of affected designated ecological sites has been performed, in accordance with recently released reports by the JNCC (Chapman & Kite, 2021a and 2021b). IAQM 'A guide to the assessment of air quality impacts on designated nature conservation sites' (2020), 'Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations' (2018) and Highways England 'LA105 Air Quality' (2019) has also been referenced in the assessment.

	Need to ensure sites currently missing from the table are included and assessed, for example, Alderford Common SSSI, Colton Wood Ancient Woodland, and that the sensitivity of River Wensum SAC isn't inadvertently dismissed.		All screened in designated ecological sites are included in **Table 22-34** of **ES Chapter 22 Air Quality** (document reference 6.1.22), **ES Appendix 22.4 Designated Ecological Sites and Critical Load Values in the Air Quality Study Area** (document reference 6.3.22.4) and **ES Appendix 22.5 Air Quality Ecological Receptor Assessment Tables** (document reference 6.3.22.5). The River Wensum SAC (and SSSI) and Alderford Common SSSI are both included in the assessment presented in **Section 22.6.1.3** of **ES Chapter 22 Air Quality** (document reference 6.1.22). and **ES Appendix 22.5 Air Quality Ecological Receptor Assessment Tables** (document reference 6.3.22.5). As no acidity Critical Load values for the River Wensum SAC are provided on the APIS website (CEH, 2022), the impact on acidity Critical Levels has not been assessed; however, the Project and in-combination contribution to acid deposition at the River Wensum SAC (and SSSI) is presented.

			Colton Wood ancient woodland is not located within 200m of road links affected by Project-generated traffic and therefore has not been included in the road traffic emissions assessment (and therefore the Critical Load values for Colton Wood have not been included in **ES Appendix 22.4 Designated Ecological Sites and Critical Load Values in the Air Quality Study Area** (document reference 6.3.22.4). As Colton Wood is in proximity to the Project boundary, it has been included in both the construction dust and Non-Road Mobile Machinery (NRMM) emissions assessments.

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Appendix 24.4 – Designated Ecological Sites & Critical Load Values in the Air Quality Study Area Section: Table 24.4.1: Designated ecological sites and Critical Load values (pg 19) Comment Features of the River Wensum SAC are noted to be sensitive to acidity and nutrient nitrogen on the APIS website but noted to have no specified critical loads available due to being mainly 'P limited (or N/P co-limiting), therefore decisions should be taken at a site-specific level'. The Applicant has recorded it as N/A within the table which suggests that this site isn't sensitive, but provides no rationale for this statement. Also, there is no mention of Alderford Common SSSI within this table, despite being close to the PEIR boundary and noted on the APIS website as being sensitive to acidity and nutrient nitrogen. Again, there is no mention of Colton Wood Ancient Woodland named within the table (despite being close to the PEIR boundary in the chapters figures)	No	Potential indirect effects as a result of increased traffic numbers as well as in-combination effects arising from other developments on ecological receptors is presented in **Section 20.6.1.1** of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20).

	Recommendations Need to ensure sites currently missing from the table are included and assessed, for example, Alderford Common SSSI, Colton Wood Ancient Woodland, and that the sensitivity of River Wensum SAC isn't inadvertently dismissed.		

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 24 Air Quality Section 24.5.4.1.2 Table 24- 26 And point 182. And Table 24- 45, And Point 223 Comment River Wensum SSSI and Colton Wood ancient woodland within or 0m from PEIR boundary – re. sensitive to dust impacts Code of Construction Practice (CoCP) will be submitted at ES stage (point 182. On page 92). Mentions the development and implementation of a 'Dust Management Plan' Table 24-45, page 138, impact 3 (Construction road vehicle exhaust emissions) on designated ecological sties to be assessed at ES stage. 'In-combination increases in nutrient nitrogen and acid deposition and NOx concentrations may also cumulatively affect designated sites'. Recommendations Please ensure that the designated ecological sites (detailed in appendix 24.4) and associated critical load values are considered at the ES stage, as stated within text.	No	Potential indirect effects as a result of increased traffic numbers as well as in-combination effects arising from other developments on ecological receptors is presented in **Section 20.6.1.**1 of the **ES Chapter 20 Onshore Ecology and Ornithology** (document reference 6.1.20).

	Natural England advises the Applicant to include commitments within the Outline Traffic Management Plan, CoCP and Schedule of Mitigation to include mitigation to reduce, wherever possible, impacts to designated sites. If there is likely to be an effect on a designated feature, the OLEMS should include mitigation measures to reduce changes in air quality, e.g. using efficient vehicles, reducing number of vehicles/time on the road, timing of construction to support biodiversity, possible use of barriers etc.		
Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 24 Air Quality Section 24.4.3.3.7 Comment Various diffusion tube locations are discounted from the verification process, therefore 4 of the 9 original locations are used. Recommendations Please provide further justification that this remains sufficient for model verification.	No	Noted and no changes or action required.

Natural England	Table 9.1 – Onshore Ecology and Air Quality Detailed Comments Chapter 24 Air Quality Section 24.4.1.2 Table 24-6, Comment Mentions that Critical Levels have been taken from APIS website, as previously recommended by NE Recommendations No recommendation required.	No	Noted and no changes or action required.

21 Seascape and Visual Impact Assessment

Consultee	Comment	Development Change?	Response
Norfolk Coast Partnership	The visual Impact of the turbines differs at different times of the year and different times of the day. Certainly some days the coastline can look highly industrialised with a continuous line on the horizon. An LVIA needs to show impacts from different conditions.	No	The SVIA considers the variability of atmospheric conditions that affect the Norfolk Coast; however it sets out its assessment of effects based on the realistic worst-case scenario and assumes that visibility is at its optimum.

North Norfolk District Council	It may be beneficial to review the data that underpinned the Dudgeon windfarm again to understand whether its visibility from shore is occurring at a greater or lesser extent than was originally predicted which may help inform assumptions for these projects.	No	A review of the Sheringham Offshore wind farm (SOW) and Dudgeon Offshore wind farm (DOW) assessments has been undertaken and used where appropriate to inform the SVIA. SOW and DOW form part of the baseline for the assessment of SEP and DEP presented in this chapter.
North Norfolk District Council	Whilst the report refers to turbines only being in place for circa 35 years, it is highly probable that turbines will be retained or updated through repowering and with further DCO consent so the assumption that turbines will eventually be removed is only true in the event that generation of electricity from wind were to cease which seems most unlikely.	No	The assessment presented in this chapter assesses the potential impacts of SEP and DEP only, and for a 40-year period. Potential extensions or repowering are not part of these projects. Any potential extension would be granted under a separate planning application and would be assessed separately on its own merit.

North Norfolk District Council	Whilst the extension to SEP would sit behind the existing turbines but also extend either side (east and west), the DEP extensions would noticeably extend the field of view of turbines east and west of the existing turbine field. The turbine fields as extended would therefore be highly visible both during the day and also during the night as a result of a need for navigation and aviation lighting. Whilst the pre-existence of the Sheringham Shoal and Dudgeon windfarms will be factored in to the assessment of impact, NNDC consider the significant extensions proposed would have an adverse impact on the overall seascape and lighting would also detract from the dark skies character of North Norfolk. Whilst these elements would weigh against the project, it would be a matter for the Examiners and Secretary of State to weigh these matters in the planning balance against the public benefits of the proposal.	No	We note NNDC's comments and opinion on the potential impact that would arise as a result of SEP and/or DEP. **Section 25.6** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25) presents the assessment of potential effects and includes consideration of the potential effect of SEP and/or DEP on the existing seascape and night-time views/ dark skies, including the presence of existing wind turbine arrays. The factors noted by NNDC have been accounted for in the design of the SEP and DEP, as outlined in Section 25.3.3 of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25). The Applicant concurs with North Norfolk District Council (NNDC) that it is for the Examiners and Secretary of State to weigh impacts presented in this chapter in the planning balance against the public benefits of the proposal.

Natural England	The turbines of the existing Sheringham Shoal array do have a significant adverse effect on the NCAONB i.e. they do compromise the statutory purpose and have degraded the special qualities of the designation, whereas the turbines within the Dudgeon array do not.	No	We note Natural England's opinion. Effects on the special qualities of the Norfolk Coast Area of Outstanding Natural Beauty (NCAONB) relating to seascape, landscape and visual qualities are assessed in this chapter (see **Section 25.6.2.4.1** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25)). Effects on all of the special qualities, as defined in the Norfolk Coast Area of Outstanding Natural Beauty Five Year Strategy (2019-24) (Norfolk Coast Partnership, 2019) are assessed separately in **An Assessment of the Impacts on the Qualities of Natural Beauty of the Norfolk Coast Area of Outstanding Natural Beauty** (document reference 9.25).

Natural England	**Design and layout issues** Natural England expressed concern on the wind array parameters and design with regards to a number of issues. In summary: - Turbine height and the size contrast with existing smaller turbines (paras 1.2 and 40). - Due to the greater separation distance and the taller turbines used for the Dudgeon array the difference in height will be less apparent for the DEP scheme, but still discernible (para 1.2). - The additional lateral spread of DEP is considerable and will effectively more than double the horizontal extent of the combined Dudgeon/DEP array. However, the greater separation distance from the NCAONB coastline and location of the Sheringham Shoal/SEP arrays in the intervening seascape will help to negate some of the potential for significant effects from this project (paras 1.3 and 16). - The lateral spread of the SEP scheme is more modest. As a clear separation gap between the Race Bank array and western portion of SEP has been maintained the absolute worst-case scenario, the merging together of these arrays has been avoided and is welcomed (paras 1.3 and 16). - The combined visual effect of SEP and DEP and existing arrays will be incoherent and present a confusing vista in views of the sea (paras 1.3, 16 and 62). - SEP turbines too big and too close to the coastline of the AONB (para 62).	No	**Section 25.6** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25) sets out the assessment of effects, which assesses SEP or DEP, and SEP and DEP together, with existing offshore wind farms. The assessments assess effects resulting from factors including the differences in height between existing and proposed turbines. The assessment is based on the wind turbine array parameters, and not a specific array design layout. Design Objectives have been identified to help guide detail design, as explained in the **Design Statement (Offshore)** (document reference 9.326).

	- NE would like design changes including moving turbines further from the coast, omitting turbines from specified areas and focusing turbines in specified areas (paras 18 to 21).		

Natural England	EN-1 (5.9.19) invites comparisons with other consented/built offshore wind arrays. Natural England has significant revisions about the usefulness of such comparisons and the robustness of the conclusions drawn. Previously we have advised that comparisons between different offshore arrays located of the coast of different designated landscapes should only be undertaken when all the parameters of the compared schemes and their specific impacts upon the receiving designated landscapes are included in the comparison exercise. As there is no agreed method for such an exercise the potential for further complication of the issue is highly probable. However, in the case of the DEP and SEP schemes the making of comparisons with existing consented arrays off the coastline of the NCAONB cannot be avoided and should be incorporated into the determination process.	No	SEP and DEP would be seen in the context of existing offshore wind farms. The existing wind farms are part of the existing baseline, and the assessment of effects of SEP and DEP in **Section 25.6** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25) takes this into account, including comparing the existing wind farms with the realistic worst-case scenarios for SEP and DEP. A key reason why fewer larger turbines was agreed as the realistic worst-case scenarios is because the contrast in turbine size and spacing would be greatest when compared to the existing smaller and more closely spaced existing wind farms, to ensure that the greatest potential effects are assessed. See **Section 25.3.2** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25) on the realistic worst-case scenario.

Natural England	We agree with the Applicant that scenario 2 is the realistic worst-case scenario. [Larger and more widely spaced turbines]	No	Realistic worst-case scenarios for SEP and DEP, based on larger and fewer (i.e. more widely spaced) turbines have been assessed in this chapter, as described in **Section 25.3.2** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25).
Natural England	SLVIA methodology is suitable for assessing effect on landscape and visual receptors located within the NCAONB and NNHC. We are content that the approach taken by the Applicant is adequate. Natural England prefers for a significance of effect judgement for each special quality assessed (in this case 3) rather that a summated judgement as is the case here (Table 27-20 p.131). However, in this instance we are content that the approach taken by the Applicant represents a sufficiently rigorous method.	No	Noted. The method presented in **Section 25.4.3**, and the assessment in **Section 25.6**, follows the same approach followed in the PEIR chapter. Both sections can be found within **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25).
Natural England	**Public opinion**	No	As noted in **Paragraph 89**, visual effects are generally described as being neutral unless specific factors contribute to positive or adverse effects.

	The information contained in the Plymouth Marine Laboratory data, that a substantial minority of the UK population (47%) do not think that offshore wind farms 'spoil the view' is too be welcomed as the nation seeks to transform its energy production infrastructure in response to the Climate Crisis. We also note that 42% of the UK public do think that offshore wind farms 'spoil the view' whilst 40.6% consider offshore winds farms 'negatively affect the wilderness image of the sea' whereas 35% of respondents do not. Natural England concludes from this data that public opinion is more or less split on these topics and so using the 'precautionary principle' to treat the effects from these machines as adverse in all instances is correct.		As noted in **Paragraph 90**, in keeping with the general planning policy presumption that distinctive character should not be altered and designated landscapes should be protected from development, effects on seascape and landscape receptors are generally presumed to be adverse. Both paragraphs can be found within **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25).
	Visibility	No	This is factored into the assessment to ensure that 'worst-case' effects are assessed.

	We note the commentary on offshore visibility and the data presented in Table 27-13 (p.48) and offer the following advice on this subject. Offshore visibility is 'very good' (20km to 39km) or 'excellent' (distances beyond 40km) for at least 60% and up to 76% of the time during the peak holiday season months of May to October. Therefore, the turbines of the SEP will be visible for most of the time when views out to sea are valued the most. Generally, people don't value the views out to sea when visibility is limited due to coastal fog, mist, or haze. But does value views out to sea on clear days when views to the far horizon are possible. As the commentary offered by the Applicant makes no reference to when visual receptors value views out to sea the most, we advise that this is in the months of May through to October.		
Natural England	Due the substantial height of the machines it is likely that whilst the bases and lower portions of the turbine towers may be shrouded the upper portions and blades will be visible above the upper limit of the off-shore haze, sea fog, mist etc. When visibility out to sea is less than 15km, should the blades be rotating the resulting spectacle would be both noticeable and attract attention due to the strange vista presented. Natural England advises the Applicant to further consider the likelihood and probable frequency of such an occurrence, using the visibility data in Table 25-13 p.48. And if necessary, amend judgements on the significance of effect in the Environmental Statement.	No	The assessment is based on excellent visibility conditions when effects would be at their greatest to ensure that 'worst-case' effects are assessed. It is not considered that greater effects would occur in times of reduced visibility, including if only parts of the wind turbines are visible.

Natural England	**Seascape baseline and assessment** agreed for Seascape Character Areas (SCAs) 03, 07 and 09	No	Noted. Effects on these SCAs are assessed in **Section 25.6.2.1** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25).
Natural England	**Landscape baseline and assessment** Agreement on offshore assessments for 7 Landscape Character Types (LCTs) (DCM 1, RV, ROF, TF, RHA, WGR and Coastal Slopes).	No	Noted. Effects on these LTCs are assessed in **Section 25.5.6.3.1** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25).
Natural England	**Landscape baseline and assessment** Disagreement for 4 LCTs (DCM 2, CS 1, OCM 1 and A Open Coastal Marshes) due to differences with regard to ratings, and judgements leading to disagreement on significance.	No	Noted. Effects on these LTCs are assessed in **Section 25.6.2.2** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25).
Natural England	**Viewpoints** Scale of visual effects at each viewpoint (Table 27-17). Judgements for 7 of 14 DEP viewpoints agreed. Judgements for SEP viewpoints disagreed.	No	Effects on viewpoints are assessed in **ES Appendix 25.4 Viewpoint Descriptions** (document reference 6.3.25.1) and summarised in **Table 25-19** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25).

Natural England	Single Frame 39.6-degree visualisations sought for 7 VPs (1, 2, 4, 10, 15, 16, 18), with focal points to be agreed.	No	Single frame 39.6-degree visualisations for these viewpoints are presented in **Figures 25.21. 25.22. 25.24. 25.30. 25.36 and 25.38** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25) using the agreed focal points.
Natural England	**Visual receptor groups sensitivity** NE disagrees with the sensitivity of users of PRoWs, accessible recreational landscapes, valued viewpoints and heritage assets or public parks within a designated landscape given in the PEIR, and considers them all to be of high sensitivity (para 45). NE identifies that this is because susceptibility of visual receptors is medium due to the presence of existing wind farms in views (para 47).	No	The Applicant has reviewed these judgements in the PEIR and has increased susceptibility and sensitivity of these visual receptors within the AONB to high.
Natural England	**Visual receptor groups significance of effect judgement** NE disagrees with assessments for some receptor groups and agrees with others.	No	Natural England's comments have been reviewed and considered in determining judgements presented in this chapter. Effects on visual receptor groups are assessed in **Section 25.6.2.3.8** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25).
Natural England	Natural England advises that due the apparent height, lateral spread, origination to the coastline, proximity to the coast and the wild, remote, and on calm days, tranquil	No	The **Design Statement (Offshore)** (submitted with the DCO, see document 9.26) demonstrates how

	character of the coastal landscapes of the NCAONB the Sheringham Shoal array has significantly degraded the natural beauty of the designation and thereby compromised the statutory purpose. We therefore consider that the baseline for the assessment of the DEP and SEP is already compromised. Whilst we agree with the Applicant's conclusion that 'existing offshore wind farms therefore already affect the wilderness character of parts of the landscape within the AONB' (paragraphs 488 p.116, 491 p.139 and other instances) the presence of the Sheringham Shoal array does not justify or make acceptable the introduction of further turbines into the seascape setting of the designation. The statutory purpose of the NCAONB is to conserve and enhance natural beauty; it is not to neglect and make natural beauty worse. Each scheme should be judged on the scale of the predicted impact upon the statutory purpose of the designation and not simply against the existing landscape/seascape baseline, which in this case is already compromised. As currently configured the DEP and SEP schemes will further harm the natural beauty of the designation and further erode the reason why the area was designated in the first place. Our assessment of the effects on the landscape receptors which underpin the key qualities of natural beauty of the NCAONB and the effects on the visual receptors who visit to enjoy these key qualities and the visual amenity afforded by views within and from the designation support this conclusion.		SEP and DEP will fulfil requirements for 'good design' as set out within the National Policy Statement for Energy (NPS EN-1) (draft, 2021). It explains the design evolution of the offshore works to date and the considerations that will inform the detailed design of the final offshore works in a clear and structured way. Careful consideration of the potential to affect sensitive environmental resources, , will form an integral part of the final design development of SEP and/or DEP post DCO-consent. Effects on the special qualities of the NCAONB relating to seascape, landscape and visual qualities are assessed in **Section 25.6.2.4.1** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25). The existing SOW and DOW form part of the baseline for the assessment of SEP and DEP presented in **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25).

			Effects on all of the special qualities, as defined in the Norfolk Coast Area of Outstanding Natural Beauty Five Year Strategy (2019-24) (Norfolk Coast Partnership, 2019) are presented separately in **An Assessment of the Impacts on the Qualities of Natural Beauty of the Norfolk Coast Area of Outstanding Natural Beauty** (document 9.25) and draws from all relevant topics within the ES.
Natural England	**Norfolk Coast AONB (NCAONB)** NE disagrees with the Applicant's judgement that effects on the NCAONB will not be significant. The effect of the SEP scheme, and south-east portion of the DEP scheme, will have a significant adverse effect on the statutory purpose of the NCAONB. The assessment has also concluded that adverse effects (moderate) will occur on the 'character and views' (Table 27-20 p.131) of the NCAONB. There is in fact little difference between the Applicant's judgement and our own. We suggest this simply a matter of a difference in professional judgement and interpretation of the evidence.	No	Effects on the Norfolk Coast AONB are assessed in **Section 25.6.2.4.1** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25).
Natural England	**North Norfolk Heritage Coast (NNHC)** NE advises that the effect of the SEP scheme, and south-east portion of the DEP scheme, will have a significant adverse effect on the special character of the NNHC. We disagree therefore with the Applicant's judgement.	No	Effects on the NNHC are assessed in **Section 25.6.2.4.2** of **ES Chapter 25 Seascape and Visual Impact Assessment** (document reference 6.1.25).

22 Noise and Vibration

Consultee	Comment	Development Change?	Response
National Highways	National Highways identified critical road links for consideration in the DCO application.	No	The traffic data supplied to inform the noise assessment included the links identified by National Highways. Refer to **Section 23.6** of **ES Chapter 23 Noise and Vibration** (document reference 6.1.23).
North Norfolk District Council (NNDC)	Chapter 25 - Noise and Vibration The contents of this chapter are noted together with the technical appendices. These issues have not been considered in detail by NNDC at this time but, in the main the most likely noise and vibration impact will arise from transport and construction activities. NNDC would wish to work with Equinor in the preparation of any Outline Codes of Construction Practice and Outline Traffic Management Plans which can help avoid, or mitigate and potential adverse noise and vibration impacts.	No	Noted. Refer to **Section 23.6** of **ES Chapter 23 Noise and Vibration** (document reference 6.1.23).

Swainsthorpe Parish Council	We are concerned that other similar projects and equipment emit an audible electronic hum. We appreciate assurance that this substation will not present a new issue for Swainsthorpe, nor exacerbate existing high pitch noise from electrical pylons. Swainsthorpe Parish Council supports national infrastructure projects and would like to work and cooperate with Equinor to ameliorate problems and disadvantages to our community.	No	No new pylons or alterations to existing pylons are proposed as part of SEP and DEP. Potential construction and operation noise impacts are discussed in **Section 23.6** of **ES Chapter 23 Noise and Vibration** (document reference 6.1.23).

23 Traffic and Transport

Consultee	Comment	Development Change?	Response
Cley-next-the-sea Parish Council	Beach Lane • Beach Lane particularly is a narrow road, used by tourist traffic, local residents, local fishermen and the emergency services. It is not suitable for HGVs.	No	No DEP and SEP construction traffic is proposed to use Beach Lane at Weybourne. Access to the landfall is proposed from the existing Muckleburgh Collection access from the A149. Further details of the proposed access routes are provided within the **Outline Construction Traffic Management Plan** (document reference 9.16) submitted with the

			Development Consent Order application.
Cley-next-the-sea Parish Council	Main coast road • Equinor has committed to using HDD under the A149, but we are still concerned that this could create some disruption.	No	The Applicant can confirm trenchless technology, such as, Horizontal Directional Drilling (HDD) will be utilised to install the DEP and SEP cables under the A149. This type of technology allows cables to be installed under roads without them needing to be closed and therefore minimises the disruption to the travelling public. This technology is favoured by highway authorities and has been used extensively for other wind farm projects across the UK including on major trunk roads.
East Suffolk Council (ESC)	Traffic and Transport We have reviewed PEIR Volume 1 Chapter 26 – Traffic and Transport. Table 26-36 provides a summary of projects considered for the Cumulative Impact Assessment in relation to traffic and transport project screening. Projects included in this assessment that are within or partly within East	No	The Applicant welcomes East Suffolk's Councils (ESC) confirmation that there would be no potential for cumulative onshore impacts with Sizewell C. The Applicant notes the comments in relation to the

	Suffolk Council's district include East Anglia Two and East Anglia Three offshore wind farms, noting the expected construction start periods of 2023 and 2025 respectively. The EA2 DCO is currently in the final stages of Examination and the EA3 DCO has been consented, a commencement date for EA2 of 2023 is considered accurate but EA3 must commence by 2022 on the basis of the EA3 DCO. The cumulative assessment rationale provided states that the study areas of these projects do not overlap with that of SEP and DEP meaning there is no potential for the construction traffic to interact. ESC however considers that there could be cumulative effects resulting from port activities, dependent on the chosen port, and potentially other construction traffic. Suffolk County Council as the local highway authority is likely to provide further comment on these matters. It should be noted that EA1N offshore wind farm is at the same stage of DCO Examination to that of EA2, however this has not been included in the assessment table. Sizewell C is also listed in the table where it is stated that this has an expected construction period of 2022-2034, concluding that the study areas of the projects do not overlap and there is no potential for the cumulative construction traffic impacts with that of DEP and SEP. ESC also agree with this due to the distances involved between the developments.		potential Nautilus and Eurolink interconnectors, however, at the time of drafting the DCO application there is insufficient information available in relation to these projects to allow a cumulative impact assessment to be undertaken. The Applicant notes ESCs comments in relation to the potential for cumulative impacts at ports in Suffolk from DEP and SEP with Sizewell C and East Anglia One North and East Anglia TWO. It is however, not possible at this stage to confirm if ports in Suffolk (e.g. Lowestoft) would be used during the construction and/or operation of DEP and SEP. Such facilities would however likely be provided or brought into operation by means of one or more planning applications or as port operations with permitted development rights.

	Finally, the table includes the Nautilus Interconnector project, having an expected construction period of 2024 to 2028. It is states that the project is at the pre-application stage and there is insufficient information within the public domain to enable a traffic and transport cumulative impact assessment. A review of the project will therefore be undertaken prior to submission of the DCO application. This project is expected to make landfall within East Suffolk and the ongoing assessment approach is acceptable. It is noted in 26-1 'Indicative Construction Programme - DEP and SEP built alone or DEP and SEP built together concurrently' that offshore construction works are proposed in Years 3 and 4 of the overall construction timeframe. In Section 183 you advise that the earliest date that construction could commence for main installation works would be 2025, suggesting that offshore construction works would therefore be undertaken circa 2028/29. If Sizewell C is approved, the proposed SEP and DEP construction period will overlap with that of Sizewell C which involves a large proportion of coastal transport of materials. This potential interaction should be given due consideration. Similarly, assuming approval is granted for EA1N		

	and EA2, offshore construction works for the proposed offshore wind farm developments are likely to initiate in 2023. Any proposed use of coastal ports in East Suffolk would benefit from early planning should a need arise (however no such need has been identified at this stage). PEIR Volume 1 Chapter 15 – Shipping and Navigation provides details of potential cumulative impacts on coastal activities in this region, with Section 190 stating that the project screening has been informed by the development of a cumulative impact assessment project list which forms an exhaustive list of plans, projects and activities in a very large study area relevant to DEP and SEP. However, whilst this list includes reference to EA1N, EA2 and EA3 offshore wind farms (stating they are within 100nm and have an effect on cumulative routeing), no reference is made to Sizewell C and its proposed coastal construction activities which will be far reaching due to the scale of the development and volume of materials required. The project list used to inform the cumulative impact assessment is therefore not considered exhaustive.		
Highways England (now known as National Highways)	Recommendations regarded as important but not critical 7. A full detailed collision analysis, of the locations stated in Recommendation 2 from TN01, should be carried out. (para 3.4) 8. A full detailed collision analysis of the A47/	No	Subsequent to the publishing of consultee comments, the Applicant and Highways England (now National Highways) have held a further Expert Topic Group Meeting (ETG) on the 13 July

	B1535/ Berrys Lane junction should be carried out. (para 3.5) 9. Recommendation 9 of AECOM TN01 remains outstanding. (para 3.11) 10. Recommendation 13 of AECOM TN01 remains outstanding. (para 3.18) 11. Recommendation 15 of AECOM TN01 remains outstanding. (para 3.24) 12. Recommendation 18 of AECOM TN01 remains outstanding. (para 3.33) 13. Recommendation 19 of AECOM TN01 remains outstanding. (para 3.35) 14. Recommendation 20 of AECOM TN01 remains outstanding. (para 3.36) 15. Recommendation 23 of AECOM TN01 remains outstanding. (para 3.42) 16. Recommendation 25 of AECOM TN01 remains outstanding. (para 3.46) 17. Highways England should have early sight of the OAMP and Abnormal Indivisible Load Study (para 4.4)		2021 to discuss these issues. During this ETG meeting, the approach to collision analysis was discussed and agreed. The resulting full and detailed collision analysis is presented in the **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) and supporting **Transport Assessment** (document reference 9.2.24.1) that accompanies the Development Consent Order application. Further responses with regards to the outstanding recommendations are outlined in the responses that follow at the end of this consultee section.
National Highways	Recommendations accepted to be addressed at a later date 18. Network Diagrams will be provided as part of the TA at a later date. (para 3.11) 19. Further details with regards to the Easton to North Tuddenham RIS scheme at the A47/ B1535 junction will be provided at a later stage, and suitable junction modelling of the amended junction	No	Reponses to these points are provided at page 468 to page 504

	(post RIS scheme implementation) will be undertaken within the TA. (para 3.17) 20. Further details with regards to the Easton to North Tuddenham RIS scheme at the A47/ Taverham Road junction will be provided at a later stage, and suitable junction modelling of the amended junction (post RIS scheme implementation) will be undertaken within the TA. (para 3.22) 21. The Easton to North Tuddenham RIS scheme has been acknowledged within the PEIR and further liaison with regards to this will be undertaken when further detail is available. (para 3.28) 22. Further details with regards to the impact of the Easton to North Tuddenham RIS scheme at the A47/ Easton roundabout will be provided at a later stage, and suitable junction modelling of the amended junction (post RIS scheme implementation) will be undertaken within the TA. (para 3.32) 23. AECOM accepts that further details with regards to the inter-relationship between the A11/ A47 Thickthorn junction RIS scheme and the A11/ Station Road junction will be provided at a later stage, and suitable junction modelling of the amended junction (post RIS scheme implementation) will be undertaken within the TA as appropriate. (para 3.39) 24. AECOM accepts that further details with regards		

	to the RIS scheme at the A47/ A11 Thickthorn junction will be provided at a later stage, and suitable junction modelling of the amended junction (post RIS scheme implementation) will be undertaken within the TA. (para 3.41)		
National Highways	1. Introduction This Technical Note provides a response to the Preliminary Environmental Information Report (PEIR) produced by Royal HaskoningDHV on behalf of Equinor in respect of the proposed Dudgeon Extension Project (DEP) and Sheringham Extension Project (SEP). These are proposed extensions to the already operational Wind Farms. The purpose of the PEIR is to provide preliminary environmental information to allow stakeholders to develop an informed view of the impacts of the development, as required by The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations 2017). The PEIR sets out the scope and methodology proposed for the Environmental Statement (ES), which will form part of the Development Consent Order (DCO) application for the Wind Farm extension. The PEIR is being consulted on until 10th June 2021, following which the comments received from consultees will be used to inform the Environmental Impact Assessment (EIA) and Environmental Statement (ES), which (it is intended)	No	Noted, no response required.

	will be submitted during later in 2021. Chapter 26 of the PEIR considers the potential impacts of the proposed Dudgeon Offshore Wind Farm Extension Project (DEP) and Sheringham Shoal Offshore Wind Farm Extension Project (SEP) on Traffic and Transport. Chapter 26 provides an overview of the existing environment for the proposed onshore development, followed by an assessment of the potential impacts and associated mitigation for the construction, operation, and decommissioning phases of DEP and SEP. The Wind Farm itself will be located off the coast. Electricity generated will make landfall at Weybourne, on the north Norfolk coast, and will access the National Grid at a substation adjacent to the A140, to the south of Norwich. The power cables linking the Wind Farm with the substation will be accommodated in an underground trench, running broadly north-south, to the west of Norwich. This cable corridor will use Horizontal Directional Drilling (HDD) to cross the Strategic Road Network (SRN) at the A47 to the west of Easton and the A11 to the south of Hethersett. The cable corridor is to be served from a number of access points, two main temporary construction compounds, and eight secondary temporary construction compounds (as well as a dedicated compound at both the landfall and substation works). Several of the access points and one of the		

	construction compounds will use a number of existing junctions on the A11 and A47 Trunk Roads for access. Figure 26.1 (sheet 4/4) of the PEIR illustrates the route of the cable corridor and the geographic extent of the study area in relation to the A11 and A47 Trunk Roads. AECOM have previously reviewed the Transport and Traffic Method Statement (TTMS) for this project and our findings are reported in Technical Note TN01 dated October 2020. This Technical Note seeks to confirm that AECOM's recommendations as documented in TN01 have been addressed in the PEIR and will review the contents of Chapter 26 and outline any issues likely to be of significance to Highways England. For ease of reference, AECOM's comments and recommendations are presented in bold and underlined text throughout the note. Recommendations regarded as critical to the acceptance of forthcoming Transport Assessment are highlighted in red. Recommendations that are regarded as important but not critical to agreement of the forthcoming Transport Assessment are highlighted in amber. Matters that need to be resolved but for which a commitment has been made by the Applicant		

	to resolve them at a later stage in the process are highlighted in blue. Issues that can be agreed as having been closed out are highlighted green.		
National Highways	2. Background 2.1 Previous work by AECOM on this scheme has been reported in a previous Technical Note (TN01, dated October 2020). TN01 responded to the revised Transport and Traffic Method Statement (TTMS) associated with the Dudgeon & Sheringham Windfarm Extensions in Norfolk. TN01 should be referred to alongside this note. 2.2 Since then, the PEIR has been published, dated April 2021. The purpose of the PEIR is to provide preliminary environmental information to allow stakeholders to develop an informed view of the impacts of the development, as required by The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations 2017). This PEIR describes the potential environmental impacts associated with DEP and SEP including the associated infrastructure both onshore and offshore. It considers impacts associated with the construction, operation, maintenance and decommissioning phases. 2.3 Chapter 26 'Traffic and Transport' of the PEIR considers the potential traffic and transport impacts of the proposed extension projects. The chapter	No	Noted, no response required.

	provides an overview of the existing environment for the proposed onshore development, followed by an assessment of the potential impacts and associated mitigation for the construction, operation, and decommissioning phases of DEP and SEP.		
National Highways	3. Review of recommendations arising from AECOM TN01 - Recommendation 1 - DfT Circular 02/2013 and its requirements should be explicitly acknowledged in any future work carried out in support of the Wind Farm (Para 3.2) 3.1 AECOM can confirm that Paragraphs 30 to 35 of PEIR Chapter 26 discuss and acknowledge the DfT Circular 02/2013, with specific details from the document referred to in relation to the development. It is also mentioned that 'Circular 02/2013 requirements have been discussed with Highways England and are addressed within this PEIR'. Therefore, this recommendation is considered to be resolved. - Recommendation 6 - Reference to other sections of the Design Manual for Roads and Bridges (DMRB) should be considered, such as CD116 (for roundabouts) GG104 (safety risk assessments) GG119 (Road Safety Audit) and GG142 (Walking Cycling and Horse Riding Assessment and Review) should any of these aspects be required to be included within the TA as part of the assessment of its impact on the SRN.	No	With regard to each of the points raised, the Applicant responds as follows: 3.1 & 3.2 - The Applicant welcomes confirmation that Recommendation 1, 6 and 7 of TN01 are considered to be resolved. 3.3, 3.4 & 3.5 - The Applicant and National Highways have discussed the requirement for further collision analysis (as per recommendation 2 and 3) at an Expert Topic Group meeting on the 13 July 2021 and this detail is provided within **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) and accompanying **Transport Assessment** (document reference 9.2.24.1) submitted with the Development Consent Order application.

	(Para 3.3) 3.2 AECOM can confirm that the DMRB sections suggested in Recommendation 6 have now been included and can be found in Table 26-6 under 'Supplementary Technical Transport Guidance' in Chapter 26. The PEIR states that the listed documents have been utilised in developing the EIA. Therefore, this recommendation is considered to be resolved. - Recommendation 7 - A 5-year period should be adopted for collision analysis rather than 3 years to identify collision clusters and better understand any causation factors, ensuring that this does not include any dates where traffic flows were affected by the Covid-19 pandemic. (Para 5.2) 3.3 AECOM can confirm that a five-year period has been adopted for collision analyses on the SRN. The time period for which the collision data was interrogated was January 2015 to December 2019, which does not coincide with the COVID-19 pandemic. Therefore, this recommendation is considered to be resolved. - Recommendation 2 - Detailed collision reports from the respective local highway authority should be obtained within identified collision cluster locations C20, C21 and C25 – C27 and reviewed to understand if causation factors can be identified so that appropriate mitigation can be considered. (Para 5.3)		

	3.4 AECOM can confirm that the collision cluster sites stated in Recommendation 2 have been analysed to an extent that high level collision patterns have been identified across the junctions in their entirety. However, AECOM consider that a more thorough review could be undertaken whereby each location within the junction (i.e., each junction approach, exit, roundabout circulatory etc.) is examined to identify collision patterns within each junction that may be exacerbated by the additional traffic associated with the proposed windfarm extensions. It is recommended that a full detailed collision analysis, of the locations stated in Recommendation 2 from TN01, is carried out. - Recommendation 3 - In the event that the proposed A47 North Tuddenham to Easton Road Improvement Strategy (RIS) scheme is not implemented before construction of the cable corridor begins, the A47 / B1535 / Berrys Lane junction should be included within any collision analysis and detailed collision data should also be obtained for this junction. (Para 5.7) 3.5 The DCO application for the A47 North Tuddenham to Easton RIS scheme was submitted to the Planning Inspectorate in March 2021 and approved in April 2021. It is noted that the PEIR report states that the construction of the RIS is projected to begin in 2022/23 and should be complete prior to the start of the DEP and SEP		

	construction programme in 2024/2025. The A47/ B1535/ Berrys Lane junction has been included in the collision analysis (Collision Cluster C36) undertaken to date, however the collision data has been analysed to an extent that high level collision patterns have been identified across the junction in its entirety. However, AECOM consider that a more thorough review could be undertaken whereby each location within the junction (i.e., each junction approach, mainline approach etc.) is examined to identify collision patterns within the junction that may be exacerbated by the additional traffic associated with the proposed windfarm extensions. It is recommended that a full detailed collision analysis of the A47/ B1535/ Berrys Lane junction is carried out. - Recommendation 4 - At the Expert Topic Group (ETG) on 18th September 2020, it was stated that it is proposed to assess junction capacity impacts where traffic flow increases of more than 30 vehicles per hour in the peak hour are forecast. This aligns with Highways England's normal practice and therefore this threshold should be adopted for use in the TA. (Para 6.5)		
	3.6 Table 26-29 of the PEIR identifies those links where traffic flows are predicted to be in excess of 30 two-way additional vehicle movements per hour. The A47 and A11 in the vicinity of the proposals are both predicted to have in excess of 100 additional	No	The Applicant and National Highways discussed the requirement for junction capacity modelling at a subsequent Expert Topic Group meeting on 13 July

	two-way vehicle movements during the peak construction phase. Table 26-30 of Chapter 26 goes on to identify the DEP and SEP peak hour construction traffic demand during the AM and PM peak hours arriving at each junction arm of the following junctions: 1) A47 / B1535 staggered junction (west of Honingham); 2) A47 / Taverham Road staggered junction (east of Honingham); 3) A47 / Dereham Road 'Easton' Roundabout; 4) A11 / Station Lane junction; 5) A11 / A47 'Thickthorn' grade separated roundabout; and 6) A47 / A140 'Harford' grade separated roundabout. 3.7 Paragraph 505 states that 'it is considered that the increases in traffic flows through junctions 1 to 6 may require further assessments in the form of junction modelling to determine driver delay impacts.' This is welcomed; however AECOM note that the Blind Lane traffic flows are not included in the flows for the A47/ Taverham Road junction (Junction 2). In addition, the A47/ Norwich Road (east of Honingham) roundabout, the A47/ Dereham Road (Longwater Interchange) and the A47/ Watton Road junction have not been included in the list of junctions to be modelled as part of the DCO application. Given the significant increase in traffic		2021. The junctions to be modelled, the approach to data gathering and modelling software to be used were all agreed. The results of the detailed junction capacity modelling are presented within the **Chapter 24 Traffic and Transport** (document reference 6.1.24) and supporting **Transport Assessment** (document reference 9.2.24.1) submitted with the Development Consent Order application.

	predicted along the A47 through the A47/ Norwich Road roundabout to the east of Honingham (which appears to be in excess of 100 two-way movements per hour), and the positioning of the Longwater Interchange and A47/ Watton Road junction on the routes to/ from potential access points (i.e. C62-66), and peak hour two-way construction flows along Watton Road and the A1074 Dereham Road predicted to be between 60 and 100, it is recommended that these additional three junctions should be included in any modelling undertaken as part of the TA. In addition, the Blind Lane approach to the A47/ Taverham Road junction should be included in any junction modelling (including additional modelling scenarios assessing the potential RIS scheme at the A47/ Norwich Road junction, as required). - Recommendation 8 - The background traffic growth figures and approach should be clarified in the forthcoming TA and traffic growth should be calculated from the year of the data, for each data source, and uplifted to the opening or reference year. (Para 6.8)		
National Highways	3.8 The traffic flow data collection methodology and datasets used to collect traffic flow data are presented in the PEIR, in the format of a table and corresponding map (Figure 26.2). Information on the datasets given include the source, the type of dataset, the location of the link and the dates of data	No	Noted, no response required.

	collection. The data used (of relevance to the SRN) was either collected from DfT count sites, from historical data previously collected as part of the Hornsea Project Three (HP3) proposal or collected for this DEP and SEP scheme. The newest data was collected during the COVID-19 pandemic in October 2020, so 'uplift factors' have been applied to the data to account for differences in traffic flows as a result of the pandemic. AECOM broadly agree with this methodology. The use of DfT derived flows on the A47 and A11 is considered appropriate. All flows have been factored up to represent flows in the baseline year of 2020, which appears to be reasonable. The PEIR clearly states that a reference year for background traffic of 2025 has been derived to represent the traffic flows at the start of the main construction works. AECOM confirm that the TEMPRO growth factors used are appropriate. Although the resultant 2025 flows have not been provided for review, AECOM can confirm that with regards to the methodology presented within the PEIR, all points from recommendation 8 have been addressed and so this recommendation is considered to be resolved.		
National Highways	3.9 However, there are a number of locations where it is unclear where the traffic data at the junctions will be derived from in order to inform the junction modelling. The following locations are of concern: - A47/ B1535 junction: unclear how the B1535 flows	No	Please refer to the Applicant's response at page 477.

	and turning movements will be derived; - A47/ Norwich Road (East of Honingham): unclear how the Norwich Road flows and turning movements will be derived; - A47/ Taverham Road: unclear how the turning movements will be derived; - A47/ Dereham Road/ Church Lane roundabout (Easton roundabout): unclear how the northern arm and turning movements will be derived; - Longwater Interchange: unclear how the turning movements will be derived; - A47/ Watton Road: unclear how the eastern arm and turning movements will be derived; - A47/ A11 Thickthorn Interchange: unclear how the turning movements will be derived; and - A47/ A140 Harford Interchange: unclear how the turning movements will be derived.		
National Highways	3.10 It is recommended that suitable and sufficient data is obtained to allow detailed junction modelling to be undertaken within the TA.	No	Please refer to the Applicant's response at page 477.
National Highways	- Recommendation 9 - Information of the derivation of hotel beds per postcode and where the entry points for users of these hotels are within the network should be clearly outlined within the forthcoming TA so that the appropriate checks can be undertaken on the assignment of these trips. (Para 6.17)	No	Further information in relation to the distribution methodology for employees is be provided within the **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) and accompanying

	3.11 Information regarding hotel beds per postcode and where the entry points are, is set out in Appendix 26.11. However, although the distribution approach appears reasonable with the information available, no further information has been provided within the PEIR with regards to where the entry points are within the network or how the data of hotel beds per postcode area has been derived. N74Therefore, it is considered that Recommendation 9 remains outstanding.		**Transport Assessment** (document reference 9.2.24.1).
National Highways	- Recommendation 10 - Network diagrams of the employee traffic distribution and assignment should be included within the future submitted TA. (Para 6.19) 3.12 Table 26-1 of the PEIR states that Network Diagrams will be provided in the TA as part of the DCO submission. AECOM accepts that Network Diagrams will be provided as part of the TA at a later date.	No	Please refer to the Applicant's response at page 481.
National Highways	- Recommendation 11 - The google traffic travel times that form the basis of the gravity model should be based upon the typical AM peak travel times on a neutral weekday rather than live journey time estimations. (Para 6.21) 3.13 AECOM can confirm that an AM peak of (7am to 8am) for a neutral weekday (Wednesday) has been used for the derivation of HGV and employee gravity models which addresses Recommendation	No	The Applicant welcomes confirmation that Recommendation 11 of TN01 is considered to be resolved.

	11. This recommendation is considered to be resolved.		
National Highways	A47 Junction with B1535 west of Honingham 3.14 The A47/ B1535 junction has been identified as a construction access route within Figure 26.10, which shows predictions of in excess of 100 additional two-way vehicle movements during the construction peak hour on both the A47 at this location (Links 86 and 89) and the B1535 (Link 85). - Recommendation 12 - It is likely that this junction will be superseded by the junction arrangements required to serve the A47 North Tuddenham to Easton RIS scheme. The interrelationship between the Wind Farm scheme and the RIS scheme should be investigated and acknowledged in the TA. (Para 7.3) 3.15 Paragraph 506 of the PEIR acknowledges the A47 North Tuddenham to Easton RIS scheme and states that the A47/ B1535 Junction is part of the RIS scheme which is due to commence construction in early 2022/23 with a likely completion by 2024/2025, (potentially the same year when DEP and SEP peak construction is due to start). 3.16 Paragraph 507 of the PEIR states that 'the A47 North Tuddenham to Easton RIS scheme has submitted a PEIR, however, no traffic generation	No	The Applicant has undertaken further engagement with National Highways at an Expert Topic Group (ETG) meeting on the 13 July 2021. On the assumption that the RIS schemes were not consented or were not complete prior to the commencement of DEP and SEP, it was agreed (at the ETG meeting) to assess the potential impacts of an increase in construction traffic (from DEP and SEP) upon the existing junction layouts. It was agreed that the assessments would include, detailed junction capacity modelling and detailed collision analysis. This detailed analysis is be provided within the **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) and accompanying **Transport Assessment** (document reference 9.2.24.1)

	during construction or traffic redistribution during operation of the new highway layout is included. The full DCO application is due to be submitted in early 2021 which should provide the necessary traffic details ahead of submission of DEP and SEP DCO application'. 3.17 Paragraph 510 states 'the Applicant is committed to engaging with both HE and NCC to establish the appropriate bounds for the driver delay assessment to be completed prior to DCO application submission'. This should be welcomed by Highways England. AECOM accepts that further details with regards to the RIS scheme at the A47/ B1535 junction will be provided at a later stage, and suitable junction modelling of the amended junction (post RIS scheme implementation) will be undertaken within the TA.		submitted with the Development Consent Order (DCO) application. With regards to the potential for cumulative impacts, it was agreed that the potential for the overlap of the construction of DEP and SEP and the RIS schemes would be best managed through commitments within the respective Construction Traffic Management Plans (CTMPs). The Applicant has included a commitment within the Outline Construction Traffic Management Plan (CTMP) (document reference 9.16) to working with National Highways to schedule works and activities to manage the potential for cumulative impacts. During the ETG meeting, National Highways requested a sensitivity test that would examine the capacity of the RIS schemes to accommodate increases in DEP and SEP construction traffic. These sensitivity tests are provided within the **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) that

			accompanies the DCO application.
National Highways	- Recommendation 13 - In the event that the Wind Farm construction precedes the opening of the RIS scheme, this junction should be assessed in the following ways: o An assessment of the current junction layout against the requirements of DMRB design standard CD123; o An assessment of the collision record of this junction; and o If the traffic flow increases are sufficient to warrant it, a PICADY model to determine any capacity problems associated with this junction. (Para 7.4) 3.18 With the exception of the assessment of the collision record at this junction (see also recommendation raised within Paragraph 3.4), no detail or commitment has been provided with regards to the assessment of the current junction layout against the relevant DMRB standard. The report estimates additional construction traffic demand during the AM and PM peak hours, and for the A47 Junction with B1535 west of Honingham there are 103 total vehicles arriving at the junction in the AM and 103 vehicles in the PM (associated with	No	Please refer to the Applicant's response at page 477 and page 482.

	DEP and SEP construction activities). PICADY modelling has not been carried out yet, however AECOM consider that the additional construction traffic generated by the scheme is sufficient to warrant junction modelling. In the PEIR, the A47 Junction with B1535 west of Honingham has been identified as a sensitive junction to inform further discussions with NCC / Highways England (HE) regarding the need for junction capacity assessment Post PEIR, however no commitment has been provided with regards to the provision of an PICADY model for the current junction layout. Therefore, it is considered that Recommendation 13 remains outstanding.		
National Highways	A47 Junction with Taverham Road east of Honingham 3.19 The A47/ Taverham Road junction has been identified as a construction access route within Figure 26.10, which shows predictions of in excess of 100 additional two-way vehicle movements during the construction peak hour on the A47 at this location (Links 89 and 94) and between 60-100 additional two-way vehicle movements on Taverham Road (Link 90). - Recommendation 14 - It is likely that this junction will also be superseded by the junction arrangements required to serve the A47 North Tuddenham to Easton RIS scheme. The interrelationship between the Wind Farm scheme	No	Please refer to the Applicant's response at page 477 and page 482.

	and the RIS scheme should be investigated and acknowledged in the TA. (Para 7.7) 3.20 Paragraph 506 of the PEIR acknowledges the A47 North Tuddenham to Easton RIS scheme and states that the A47/ Taverham Road Junction is part of the RIS scheme which is due to commence construction in early 2022/23 with a likely completion by 2024/2025, (potentially the same year when DEP and SEP peak construction is due to start). 3.21 Paragraph 507 of the PIER states that 'the A47 North Tuddenham to Easton RIS scheme has submitted a PEIR, however, no traffic generation during construction or traffic redistribution during operation of the new highway layout is included. The full DCO application is due to be submitted in early 2021 which should provide the necessary traffic details ahead of submission of DEP and SEP DCO application'. 3.22 Paragraph 510 states 'the Applicant is committed to engaging with both HE and NCC to establish the appropriate bounds for the driver delay assessment to be completed prior to DCO application submission'. This should be welcomed by Highways England. AECOM accepts that further details with regards to the RIS scheme at the A47/ Taverham Road junction will be provided at a later stage, and suitable junction modelling of the amended junction (post RIS scheme implementation) will be undertaken within the TA.		

National Highways	-Recommendation 15 - In the event that the Wind Farm construction precedes the opening of the RIS scheme, this junction should be assessed in the following ways: o Review of the alternative temporary proposed access arrangements for the A47 / Taverham Road junction, with a view to partially fund or implement the scheme; o Should this not be feasible, investigate other ways of minimising the conflicts between A47 traffic and traffic turning into and out of Taverham Road and Blind Lane; o An assessment of the current and proposed junction layout against the requirements of DMRB design standard CD123; o An assessment of the collision record of this junction; o If the traffic flow increases are sufficient to warrant it, a PICADY model should be used to determine any capacity problems associated with this junction; and o Consideration should be given to geometric improvements to facilitate the use of this junction by larger numbers of HGVs. (Para 7.8) 3.23 Section 26.6.1.9.16 of the PEIR outlines the temporary mitigation works proposed at this location as part of HP3 and states that either these temporary mitigation works or the RIS scheme	No	Please refer to the Applicant's response at page 477 and page 482.

	would be appropriate to mitigate the existing road safety issues at this location. It is understood that AECOM previously reviewed the mitigation works as part of the HP3 EIA review and is satisfied that the first of the recommendations above has been suitably addressed. 3.24 With the exception of the assessment of the collision record at this junction (see also recommendation raised within Paragraph 3.4), no detail or commitment has been provided with regards to the assessment of the current junction layout against the relevant DMRB standard. The report estimates additional construction traffic demand during the AM and PM peak hours, and for the A47 Junction with Taverham Road east of Honingham there are 150 total vehicles arriving at the junction in the AM and 150 vehicles in the PM (associated with DEP and SEP construction activities). PICADY modelling has not been carried out yet, however AECOM consider that the additional construction traffic generated by the scheme is sufficient to warrant junction capacity modelling. In the PEIR, the A47 Junction with Taverham Road east of Honingham junction has been identified as a sensitive junction to inform further discussions with NCC / Highways England (HE) regarding the need for junction capacity assessment Post PEIR, however no commitment has been provided with regards to the provision of		

	an PICADY model for the current junction layout. Therefore, it is considered that Recommendation 15 remains outstanding.		
National Highways	A47 to the west of Easton 3.25 The alignment of the onshore cable route will cross the A47 between its junction with Taverham Road and its junction with Church Lane, Easton. In respect of this crossing, the following recommendations were made in AECOM TN01: - Recommendation 5 - Site access points A21 – A25 should be clearly defined in advance of the production of the forthcoming Transport Assessment; direct access from the SRN should be avoided wherever possible; and if direct access is considered essential, appropriate evidence should be put forward as to the proposed design and traffic management measures to ensure its safe operation. (Para 7.11) 3.26 At this stage it appears that there are two locations where the cabling may cross the A47 (now referenced as C57A and C57B – illustrated on Figure 26.4 sheet 3/3) through the use of HDD. These access points, which appear to be directly served from the carriageway of the A47, will require temporary site accesses to facilitate the HDD crossing proposed, in addition to the general cable corridor work to the north and south of the Trunk	No	The Applicant has undertaken further engagement with National Highways during an Expert Topic Group (ETG) meeting on 13 July 2021. It was discussed at this ETG that access from the A47 would be required in this location to allow cables to be installed under the A47 using trenchless technology and that access could not be taken from the local highway network. National Highways agreed that the access could be taken from the A47 subject to a suitable layout being developed. It was further agreed that the access should comprise of a left in and left out arrangement. A proposed access layout provided within the **Transport Assessment** (document reference 9.2.24.1) submitted with the Development Consent Order application.

	Road. Limited details have been provided with regards to the specific proposals (i.e. access design and supporting evidence) at these locations, and these should be provided to Highways England so that the proposals can be fully understood and commented on as appropriate. Therefore it is considered that Recommendation 5 remains outstanding.		
National Highways	- Recommendation 16 - The cable corridor will cross the line of the new A47 North Tuddenham to Easton RIS scheme, which AECOM understand will run to the north of the current A47 in this vicinity and will include the creation of a new junction which will supersede the current Easton roundabout. The inter-relationship between the Wind Farm scheme and the RIS scheme should be investigated and acknowledged in the TA. (Para 7.12) 3.27 Paragraph 506 of the PEIR acknowledges the A47 North Tuddenham to Easton RIS scheme and states that the A47/ Easton roundabout is part of the RIS scheme which is due to commence construction in early 2022/23 with a likely completion by 2024/2025, (potentially the same year when DEP and SEP peak construction is due to start). 3.28 Paragraph 510 states 'the Applicant is committed to engaging with both HE and NCC to establish the appropriate bounds for the driver delay assessment to be completed prior to DCO application submission'. This should be welcomed	No	Please refer to the Applicant's response at page 477 and page 482.

	by Highways England. AECOM accepts that the RIS scheme has been acknowledged within the PEIR and welcomes further liaison with regards to this when further detail is available.		
National Highways	A47 Easton Roundabout 3.29 The A47/ Easton roundabout has been identified as a construction access route within Figure 26.10, which shows predictions of in excess of 100 additional two-way vehicle movements during the construction peak hour on the A47 at this location (Links 94 and 95) and between 60-100 additional two-way vehicle movements on Dereham Road (Link 93). - Recommendation 17 - It is likely that this junction will be superseded by the junction arrangements required to serve the A47 North Tuddenham to Easton RIS scheme. The interrelationship between the Wind Farm scheme and the RIS scheme should be investigated and acknowledged in the TA. (Para 7.14) 3.30 Paragraph 506 of the PEIR acknowledges the A47 North Tuddenham to Easton RIS scheme and states that the A47/ Easton roundabout is part of the RIS scheme which is due to commence construction in early 2022/23 with a likely completion by 2024/2025, (potentially the same year when DEP and SEP peak construction is due to start). 3.31 Paragraph 507 of the PIER states that 'the A47	No	Please refer to the Applicant's response at page 477 and page 482.

	North Tuddenham to Easton RIS scheme has submitted a PEIR, however, no traffic generation during construction or traffic redistribution during operation of the new highway layout is included. The full DCO application is due to be submitted in early 2021 which should provide the necessary traffic details ahead of submission of DEP and SEP DCO application'. 3.32 Paragraph 510 states 'the Applicant is committed to engaging with both HE and NCC to establish the appropriate bounds for the driver delay assessment to be completed prior to DCO application submission'. This should be welcomed by Highways England. AECOM accepts that further details with regards to the RIS scheme at the A47/ Easton roundabout will be provided at a later stage, and suitable junction modelling of the amended junction (post RIS scheme implementation) will be undertaken within the TA.		
National Highways	- Recommendation 18 - In the event that the Wind Farm construction precedes the opening of the RIS scheme, the impact of the proposals on this junction should be assessed in the following ways: o An assessment of the collision record of this junction; and o If the traffic flow increases are sufficient to warrant it, an ARCADY model should be used to determine any capacity problems associated with this junction. (Para 7.15)	No	Please refer to the Applicant's response at page 477 and page 482.

	3.33 It is acknowledged that a collision analysis has been carried out for the A47 Easton Roundabout in the PEIR (see also recommendation raised within Paragraph 3.4). The report estimates additional construction traffic demand during the AM and PM peak hours, and for the A47 Easton Roundabout there are 185 total vehicles arriving at the junction in the AM and 185 vehicles in the PM (associated with DEP and SEP construction activities). ARCADY modelling has not been carried out yet, however AECOM consider that the additional construction traffic generated by the scheme is sufficient to warrant junction modelling. In the PEIR, the A47 Easton Roundabout junction has been identified as a sensitive junction to inform further discussions with NCC / Highways England (HE) regarding the need for junction capacity assessment Post PEIR, however no commitment has been provided with regards to the provision of an ARCADY model for the current junction layout. Therefore, it is considered that Recommendation 18 remains outstanding.		
National Highways	A11 to the south-east of Hethersett 3.34 The cable corridor will cross the A11 at one location to the south of Hethersett, approximately 3.7km to the southwest of the A11/ A47 Thickthorn junction. It is assumed that this will require temporary site accesses to facilitate the HDD	No	Please refer to the Applicant's response at page 477 and page 482.The Applicant can also confirm that it is not proposed to provide a new access from the A11.

	crossing proposed, in addition to the general cable corridor work to the north and south of the Trunk Road. Vehicles will utilise the existing A11 / Station Lane (south) junction to gain access to the SRN. The A11 has been identified as a construction access route within Figure 26.10, which shows predictions of in excess of 100 additional two-way vehicle movements during the construction peak hour on the A11 at this location (Links 114 and 120). - Recommendation 19 - It is understood that no direct access to the A11 is proposed to access sites, nor is it proposed to use the Station Lane (north) junction for site traffic. This is to be welcomed and it would be beneficial if this could be formally stated in the forthcoming TA. (Para 7.18). - Recommendation 20 - The A11/ Station Lane junction(s) should be assessed in the following ways: o An assessment of the collision record of these junctions; and o If the traffic flow increases are sufficient to warrant it, an assessment of their capacity using a PICADY model. (Para 7.19) 3.35 It does not appear from Figure 26.5 sheet 4/4 that there are any potential access points requiring direct access onto the A11 which is welcomed. Although there do not appear to be any proposals to use the Station Lane (north) junction to access any		

	potential access points, there is no formal commitment to this within the PEIR and therefore Recommendation 19 remains outstanding. 3.36 It is acknowledged that a collision analysis has been carried out for the A11/Station Lane junction in the PEIR and it was identified that there were no collisions recorded within the adopted five-year study period in the vicinity of the junction. The PEIR estimates construction traffic demand during the AM and PM peak hours, and for the A11/Station Lane there are 96 total vehicles arriving at the junction in the AM and 106 vehicles in the PM. PICADY modelling has not been carried out to date, however AECOM consider that the additional construction traffic generated by the scheme is sufficient to warrant junction modelling. In the PEIR, the A11/ Station Lane junction has been identified as a sensitive junction to inform further discussions with NCC / Highways England (HE) regarding the need for junction capacity assessment Post PEIR, however no commitment has been provided with regards to the provision of a PICADY model for the current junction layout. Therefore, it is considered that Recommendation 20 remains outstanding.		

National Highways	- Recommendation 21 - The inter-relationship between the Wind Farm scheme and the proposal to upgrade the A47/A11 Thickthorn junction through the RIS scheme in this area should be investigated and acknowledged in the TA. (Para 7.20) 3.37 Paragraph 508 of the PEIR acknowledges the A47 Thickthorn Junction (A11/ A47) RIS scheme and states that the scheme is due to commence construction in early 2022/23 with a likely completion by 2024/2025, (potentially the same year when DEP and SEP peak construction is due to start). 3.38 Paragraph 509 of the PIER states that 'a refined scheme layout has been produced however no detailed designs of the junction improvements can be found. The full DCO application is due to be submitted in early 2021 which should provide the necessary traffic details ahead of submission of DEP and SEP DCO application'. 3.39 Paragraph 510 states 'the Applicant is committed to engaging with both HE and NCC to establish the appropriate bounds for the driver delay assessment to be completed prior to DCO application submission'. This is welcomed by Highways England. AECOM accepts that further details with regards to the RIS scheme at the A47/ A11 Thickthorn junction will be provided at a later	No	Please refer to the Applicant's response at page 477 and page 482.

	stage, and the inter-relationship between the wind farm scheme and the RIS scheme can be investigated. AECOM accepts that further details with regards to the inter-relationship between the RIS scheme and the A11/ Station Road junction will be provided at a later stage, and suitable junction modelling of the amended junction (post RIS scheme implementation) will be undertaken within the TA as appropriate.		
Highways England	A11/ A47 Thickthorn Junction 3.40 The A11/ A47 Thickthorn Junction has been identified as a construction access route within Figure 26.10, which shows predictions of in excess of 100 additional two-way vehicle movements during the construction peak hour on the A47 and A11 (southwest arm) at this location (Links 105, 120 and 122) and between 60-100 additional two-way vehicle movements on Norwich Road and A11 (northeast arm) (Link 106 and Link 121 respectively). - Recommendation 22 - The inter-relationship between the Wind Farm scheme and the A11/A47 Thickthorn junction RIS scheme should be investigated and acknowledged in the TA. (Para 7.21) 3.41 As noted above, the PEIR acknowledges the A47 Thickthorn Junction (A11/ A47) RIS scheme in paragraphs 508-510. With regards to the Thickthorn	No	Please refer to the Applicant's response at page 477and page 482.

	Junction, paragraph 508 states that Junction 5 will be superseded by the RIS scheme. AECOM accepts that further details with regards to the RIS scheme at the A47/ A11 Thickthorn junction will be provided at a later stage, and suitable junction modelling of the amended junction (post RIS scheme implementation) will be undertaken within the TA.		
Highways England	- Recommendation 23 - The TTMS suggests that a number of HGV access routes will pass through, join and/or leave the A11 and A47 Trunk Roads at the A11/A47 Thickthorn junction. In the event that the Wind Farm construction precedes the opening of the A11/A47 Thickthorn junction RIS scheme, the impact of the proposals on the capacity of this junction should be assessed using an appropriate model. (Para 7.22) 3.42 The PEIR estimates construction traffic demand during the AM and PM peak hours, and for the A11/A47junction there are 118 total vehicles arriving at the junction in the AM and 122 vehicles in the PM. Junction modelling has not been carried out to date, however AECOM consider that the additional construction traffic generated by the scheme is sufficient to warrant junction capacity modelling. In the PEIR, the A11/ A47 junction has been identified as a sensitive junction to inform further discussions with NCC / Highways England (HE) regarding the need for junction capacity	No	Please refer to the Applicant's response at page 477 and page 482.

	assessment Post PEIR, however no commitment has been provided with regards to the provision of a junction model for the current junction layout. Therefore, it is considered that Recommendation 23 remains outstanding.		
Highways England	- Recommendation 24 - The use of Cantley Lane as a potential access route to the works should be dropped and link 120 deleted from the proposed access route network in the forthcoming TA. This should be embodied in the traffic management arrangements for the works. (Para 7.23) 3.43 The PEIR states that no construction traffic will use Cantley Lane with this commitment being included within embedded mitigation in Table 26-3. It is stated that the mitigation will be captured within a future OTMP to be submitted as part of the DCO application. This recommendation is considered to be resolved.	No	Noted, no response required.
Highways England	A47 to the west of the Harford Junction 3.44 The PEIR illustrates that access to the proposed onshore substation will be located to the south of the A47, west of the A140 and east of the B1113. Access is proposed via either the A140 (with traffic using the A47/ A140 Harford junction) or the B1113. 3.45 The A47 has been identified as a construction access route within Figure 26.10, which shows predictions of in excess of 100 additional two-way	No	Please refer to the Applicant's response at page 477 and page 482.

	vehicle movements during the construction peak hour on the A47 at this location (Link 122). - Recommendation 25 - Net traffic flow increases at the A47/ A140 Harford junction should be calculated and made available for scrutiny in the PEIR; and, if warranted, a junction capacity model of the junction run. (Para 7.24) 3.46 The PEIR estimates construction traffic demand during the AM and PM peak hours, and for the A47/ A140 junction there are 263 total vehicles arriving at the junction in the AM and 263 vehicles arriving in the PM. Junction modelling has not been carried out to date, however AECOM consider that the additional construction traffic generated by the scheme is sufficient to warrant junction modelling. In the PEIR, the A11/ A47 junction has been identified as a sensitive junction to inform further discussions with NCC / Highways England (HE) regarding the need for junction capacity assessment Post PEIR, however no commitment has been provided with regards to the provision of a junction model for the current junction layout. Therefore, it is considered that Recommendation 25 remains outstanding.		
National Highways	Additional Points 4.1 AECOM have reviewed the contents of Chapter 26 of the PEIR. It is considered that the methodology used within the PEIR broadly reflects the same methodology presented within the Traffic and Transport Method Statement as reviewed as	No	Noted, no response required.

	part of the previous TN. A number of key observations that have not been addressed in the sections above are listed below: - The port from which bulk materials will arrive had not been determined at the time of the publication of the PEIR report and, in the PEIR report therefore, an assumption based on the relative travel time from each port to the various access points has been used as a way of assessing the volumes of traffic likely to approach the site from the east and from the west. This remains a reasonable assumption at this stage since this is likely to be a commercial decision by the suppliers; - In terms of construction traffic demand, a similar first principles approach has been used, as per the Traffic and Transport Method Statement. The figures have changed slightly with regards to the worst case peak day HGV and personnel traffic demand, as shown below: HGV peak (two-way movements) LCV/ personnel peak (twoway movements) Previous Stage Estimations 1,594 64 to a single access Current Stage Estimations 1,063 184 to a single access - The impacts on the SRN during the operational phase are considered to be minimal (access to the		

	cable corridor would only be required for emergency repairs if necessary, and the onshore substation would require on average one visit per week). The impacts during the decommissioning phase are not likely to be worse than the construction phase (and a full EIA will be carried out ahead of any decommissioning activities).		
National Highways	4.2 Following the review of the PEIR, AECOM have outlined any issues likely to be of significance to Highways England below: 4.3 The PEIR states that a preliminary Transport Assessment is contained within the PEIR, however AECOM have been unable to locate it. It is therefore recommended that the preliminary Transport Assessment is made available to Highways England so that a review can be undertaken prior to the production of the full TA. 4.4 The PEIR report states that an Outline Access Management Plan (OAMP) and an Abnormal Indivisible Load Study will be produced and provided with the DCO application. It is recommended that Highways England have early sight of these documents so that they can be discussed and commented on prior to the DCO submission. 4.5 Section 26.5.3.1 states that 'during consultation with NCC a number of roads were identified as	No	The Applicant has undertaken further engagement with National Highways at an Expert Topic Group (ETG) meeting on 13 July 2021. With regard to each of the points it was agreed that: 4.3 - The 'transport assessment' content was included within the Traffic and Transport chapter of the Preliminary Environmental Information Report as agreed with National Highways during an ETG meeting. The Development Consent Order (DCO) application is accompanied by a separate **Transport Assessment** (document reference 9.2.24.1) and **ES Chapter 24 Traffic and Transport** (document reference 6.1.24). 4.4 - Draft documents will be shared with National Highways if

	being sensitive to tourism traffic during the summer months (23rd May to 30th September) and high commuter traffic during network peak hours. Therefore, NCC requested that sensitivity be upgraded on these links and construction vehicle caps should be introduced similar to that provided by HP3, NV and NB Offshore Wind Farm Projects'. AECOM consider that this stipulation is not necessary in respect of the SRN.		possible (subject to timescales) and engagement will be ongoing. 4.5 - Noted, no response required.
National Highways	4.6 Although no road closures are proposed on the SRN, there are a number of road closures shown in Figure 26.7 in the vicinity of the SRN (i.e. Broom Lane, Colton Road, 'unnamed road') which may impact traffic flows and junction operation at the A47 junctions. This is also the case for the A11 (road closures on B1172 Ketts Oak and B1113). It should be ensured that the TA considers the impacts of these road closures on the SRN and associated junctions. 4.7 Section 26.6.1.3.1 states that several Temporary Construction Compounds (TCCs) and up to two main compounds will be required to support the onshore cable installation. It is stated that for the purposes of the PEIR, five TCCs have been assessed which are detailed below and shown graphically on Figure 26.4: • Compound 1, located at the landfall; • Compound 2, located at Bodum;	No	With regard to point 4.6, the Applicant has undertaken further engagement with National Highways during an Expert Topic Group (ETG) meeting on 13 July 2021. It was clarified that the closures would be short term and traffic would not be directed via the Strategic Road Network. An assessment of traffic impacts resulting from diverted traffic due to road closures is included within the **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) submitted with the Development Consent Order (DCO). With regard to point 4.7 and 4.8, **ES Chapter 24 Traffic and Transport** (document reference

	• Compound 3, located south of Oulton on the B1149; • Compound 4, located on Hethersett Road; and • Compound 5, located at the substation. 4.8 Although it does not appear that any of the five assessed TCCs are within the vicinity of the SRN, Figure 26.4 does not appear to show the TCCs so this cannot be confirmed. In addition, paragraph 189 states that additional TCCs are currently being identified and will be included and assessed in the ES. This is noted; however Highways England should remain informed about the locations of the proposed TCCs so that any impacts on the SRN can be identified and mitigated as appropriate.		6.1.24) includes details of the location of all compounds and associated traffic movements. Traffic movements to the compounds are included within the assessment of traffic impacts presented within **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) and accompanying **Transport Assessment** (document reference 9.2.24.1).
National Highways	4.9 Section 4.1 of AECOM TN1 outlined what AECOM considered the principal impacts likely to be of concern to Highways England will be. Following this more recent review, AECOM consider the principal impacts likely to be of concern to Highways England to be as follows: - The impact on the A47 at Easton and the A11 at Hethersett of the construction of HDD cable crossings under the carriageway of the Trunk Road; - The impacts at a number of A47 junctions where existing collision clusters/ patterns may be exacerbated by the additional traffic associated with the proposals; - The relationship between the works proposed at	No	The Applicant has provided a detailed response to each of these points at page 577480 to page 582.

	the locations identified (i.e. A47 junctions between the A47/ B1535/ Berrys Lane junction and the A47/A140 junction) and the RIS schemes for the A47 between North Tuddenham and Easton and for the A11/A47 Thickthorn junction; - The impact of HGV traffic accessing construction sites and the construction compound via junctions and accesses on the A11 and A47 in the vicinity of Easton, Honingham and Hethersett; - The impact of HGV traffic associated with the construction of a new substation to the southwest of the A47/ A140 junction to the south of Norwich; and - The impact of HGV traffic carrying materials between the construction compound and thework sites.		
National Highways	Conclusion 5.1 The Transport & Traffic work supporting the ES is at an early stage although a considerable amount of work has been undertaken to date and AECOM welcome the opportunity to comment on it. 5.2 This Technical Note gives an initial response to the PEIR and to the issues raised in TN01. 5.3 AECOM look forward to working collaboratively with Highways England, Equinor Energy and Royal HaskoningDHV to reach a position where we can advise Highways England that all relevant impacts	No	Noted, no response required. The applicant will continue to engage with National Highways

	have been assessed and, if necessary, mitigated in an appropriate way.		
Kelling Parish Council	Kelling Parish Council's main concern with the proposal is how the construction traffic will impact on the parish. Previously with the Dudgeon Scheme the cabling was stored on the Muckleburgh Site and as such the amount of vehicle movements throughout the village caused a huge amount of noise and disruption. We would therefore ask that an alternative site is used for storage and that all construction traffic avoid the village of Kelling. Kelling Parish Council would like Equinor to share with us a Construction Traffic Management Plan and Cllrs would welcome the opportunity to be consulted on the plan and help shape how traffic is managed during the construction phase.	No	The Applicant has confirmed that the preferred location for the main compound is at Attlebridge and that this location would be used for cable storage. **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) includes details of the volumes of traffic that could be expected to pass through Kelling village (link 8). To ensure that HGVs can safely negotiate through the village, **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) identifies the requirement for mitigation measures to manage HGV movements. An **Outline Construction Traffic Management Plan** (CTMP) (document reference 9.16) is submitted with the Development Consent Order application. The outline CTMP includes measures

			to ensure that HGVs comply with the assessed routes, that vehicle numbers do not exceed the levels assessed and measures (such as the use of pilot/escort vehicles) are provided to ensure HGVs can safely manoeuvre through the village.
Mulbarton Parish Council	5. Local impacts of DEP & SEP These comments are on the basis that no other projects go ahead with grid connections at Norwich Main (such as Hornsea Three and Aminth). If those projects do proceed, then the additional impact of the Dudgeon and Sheringham Shoal extensions is unacceptable. (a) The only site access likely to be acceptable for construction traffic is the existing HGV access from the A140 into the former gravel pit at Mangreen. The planning history of this site was summarised in our Phase One consultation response. Since then, a time-limited application for the storage of highways maintenance materials on part of the site has been submitted under reference 2020-0078. The supporting documentation for this application includes the design of the HGV access route and up-to-date traffic measurement data. (b) This site also offers significant advantages for the proposed onshore substation. In addition to an existing approved HGV access, recently validated	Yes	The Applicant responds to each of the points as follows: a, b and c) The Applicant can confirm that it is no longer considering options to access the onshore substation from the B1113 and that access would either be taken from Mangreen Lane (via the A140) or the existing quarry access off the A140. Details of the final access design are provided within the **Transport Assessment** (document reference 9.2.24.1) submitted with the Development Consent Order application. d) The Applicant can confirm a commitment to installing DEP and

	for 2020-0078, it has no requirement for archaeological or environmental surveys, as these were completed some years ago. Up-to-date background noise surveys have also been carried out. There is also the possibility of retaining partial excavation of the site to reduce the landscape and visual impact of the onshore substation, mitigate the propagation of operational noise levels, and assist in meeting the requirements of the Rural Dark Landscape Zone as defined by the Norfolk County Council Environmental Lighting Zones policy and CPRE Norfolk. The PEIR boundary should be extended to include this area as a substation site option. (c) The proposed alternative temporary construction access alongside Mangreen Lane to the B1113 is not acceptable and should be removed entirely from the PEIR boundary. (d) Horizontal Direct Drilling is essential where the cable route crosses the B1113. Road closures here should be kept to a minimum, and haul road traffic should not be allowed to make frequent crossings over the B1113 at this point. For the Gowthorpe Lane crossing, the diversion shown in Figure 26.6 may need to be amended to prevent displaced traffic passing through the Mulbarton conservation area and near to the primary school. Without Hornsea Three the former gravel pit at Mangreen may be an acceptable site for the		SEP cables under the B1113 using trenchless technology (such as horizontal directional drilling (HDD)). To allow access the HDD and cable route there would be the requirement to provide an access either side of the B1113. These accesses will be de signed in accordance with the relevant standards and subject to an independent road safety audit. This process will ensure that safe access can be provided allowing drivers to access and egress from the B1113 and also cross the B1113.

	onshore substation for the Sheringham Shoal extension. The cable route previously identified for Hornsea Three offers a more direct connection to the onshore substation site. As an alternative, Site 1 may be acceptable for the Sheringham Shoal extension project only, subject to excavation of the site to a depth of 2m. This would reduce the landscape and visual impact and help to reduce operational noise. Site 2 is unlikely to be acceptable. Overhead views of the existing Dudgeon and Sheringham Shoal onshore substations, the former gravel pit at Mangreen, and the Norwich Main substation are shown on page 3. The onshore substations for Hornsea Three and the Aminth UK-Denmark interconnector are illustrated by the photographs shown on page 4.		
Norfolk County Council	3. Impact of the Proposal 3.30. Local Highway Issues 3.31. The comments made in Norfolk County Councils response to the Environmental Impact Assessment Scoping Report in October 2019 remain valid and further detailed technical considerations are set out in Appendix 1.	No	The Applicant has provided a response to all points raised as follows.
Norfolk County Council	3. Impact of the Proposal 3.32. Strategic Highway Issues 3.33. Highways England (HE) has proposed six highway improvement schemes for the A47 as part of the Road Investment Strategy (RIS). The	No	An Expert Topic Group (ETG) meeting was held between the Applicant, National Highways and Norfolk County Council on 13 July 2021. During the ETG meeting,

	schemes that could potentially impact on the Traffic and Transport Study Area are: - • A47 North Tuddenham to Easton RIS; • A47 Blofield to North Burlingham RIS; and • 47/A11 Thickthorn junction improvement RIS. HE has requested that the inter-relationship between the A47 Corridor Improvement programme and DEP/SEP be investigated and this will be assessed by HE. The applicant is asked to ensure that their underground Cable Route does not fetter any future highway improvement schemes in Norfolk i.e. the Norwich Western Link and that where any reinforcement or diversion is needed to the cable route as a result of such highway works, they will be responsible for any upgrades or diversion of the cables and will fully meet the costs of these works. The County Council, as Local Highways Authority is working closely with the applicant on the above matters.		the approach to assessment of potential cumulative impacts between the identified RIS schemes and SEP and DEP was discussed and agreed. The resulting **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) includes a detailed assessment of the potential for cumulative impacts with the identified RIS projects. The Applicant is aware of the proposed Norwich Western Link and the design of DEP and SEP includes provision to install the cables under the new road alignment using trenchless technology, such as horizontal directional drilling (HDD).
Norfolk County Council	Appendix 1 – Detailed Comments Local Highway Issues and Comments The construction phase generates the greatest number of vehicle movements with the cable installation representing the maximum construction intensity. Construction teams would work on sections of up to 1km at a time with a typical presence of four weeks along each 1km section. Three different scenarios are considered (1)	No	Noted, no response required.

	Construct DEP and SEP in isolation (2) Construct DEP and SEP concurrently and (3) Construct sequentially with a gap of up to four years between the two projects. Constructing concurrently offers the minimum realistic duration (minimum of 36 months) but results in the highest traffic demand. The earliest start date would be summer 2024, however the main construction works would likely start in 2025. Therefore 2025 has been adopted as a baseline year for background traffic growth.		
Norfolk County Council	Appendix 1 – Detailed Comments Local Highway Issues and Comments Highway Comment 1 It is agreed the concurrent scenario represents the worst-case scenario and accordingly assessing the impact in this manner is appropriate. However, traffic data was collected during pandemic lockdown and may not represent actual baseline levels. We have previously indicated that we would accept historical data provided there was a re-survey when traffic patterns started to settle down and originally suggested after May. The Governments roadmap has subsequently been published with a lifting of restrictions from 21 June, so would now accept a re-survey after 21 June 2021. During the operational phase, traffic movements would be limited, and the onshore substation will not be manned. Accordingly, no operational scenarios	No	The Applicant welcome confirmation that operational impacts can be scoped out of the assessment and that traffic movements associated with the offshore construction of DEP and SEP can be addressed by a Port Traffic Management Plan. With regard to data collection, this issue was discussed at an Expert Topic Group meeting with Norfolk County Council (NCC) on the 13 July 2021. During the ETG meeting, NCC advised that the approach adopted by the Applicant to collecting baseline traffic data during the Covid-19

	are assessed. Traffic associated with offshore construction will be dealt with by means of a requirement for a Port Traffic Management Plan.		pandemic was acceptable and appropriate for the assessment of impacts. However, NCC, clarified that they would reserve the right to request control surveys at a later date (for validation purposes) should new information come to light that may potentially impact upon the baseline traffic and transport conditions. This contingency is included within the **Outline Construction Traffic Management Plan** (CTMP) (document reference 9.16) submitted with the DCO application. The Applicant and NCC agreed that at this stage, no further data collection would be required for the **ES Chapter 24 Traffic and Transport** (document reference 6.1.24).
Norfolk County Council	Appendix 1 – Detailed Comments Local Highway Issues and Comments Highway Comment 2 It is agreed that assessing the impact in this manner is appropriate. An assumption to inform the assessment of construction traffic has been made against a total of 259,200 tonnes of stone being required for the	No	Noted, no response required.

	construction of the haul road and 110,274 tonnes of surplus material being removed (due to ducting, joint bay construction and associated stabilised backfill). Daily HGV movements are based upon 22 working days per month (equivalent to five day working) and profiled over a 10-hour window. A 12 hour “delivery window” has been assumed with ten hours delivery time allocated.		
Norfolk County Council	Appendix 1 – Detailed Comments Local Highway Issues and Comments Highway Comment 3 The delivery of materials and plant to the cable installation locations could occur between 7am and 7pm. Excessive deliveries should be avoided at traffic sensitive times on some key routes. This will need to be clarified. The study Area (TTSA) is divided into 156 links with the anticipated construction traffic shown for each link. A preliminary Transport Assessment (TA) will be provided which will be updated when the Development Consent Order (DCO) is submitted. ‘Traffic sensitive’ routes including the A148, A149, A1067 and the B1436 including details of existing and potential HGV caps are identified.	No	An Expert Topic Group (ETG) meeting was held between the Applicant and Norfolk County Council (NCC) on 13 July 2021 and on the 31 March 2022. During these ETG meetings, clarification was sought from NCC with regards to the issue of managing 'excessive deliveries'. During the ETG dated 31 March 2021, details of forecast construction peak hour and daily traffic flows were shared with NCC and NCC subsequently advised of those locations they consider particularly sensitive to driver delay effects. **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) includes a review of increases in traffic via these

			particularly sensitive links to understand the potential impacts of SEP and DEP construction traffic upon driver delay.
Norfolk County Council	Appendix 1 – Detailed Comments Local Highway Issues and Comments Highway Comment 4 The basic methodology is acceptable and further detail is awaited. At this stage officers are still assessing the applicants projected impact for each of the 156 links including the proposed HGV traffic caps. Options for accessing the substation from either the A140 or the B1113 are being considered. The access strategy will be finalised post-PEIR and further discussions will be held with highway stakeholders to agree the extent of any cumulative assessment required at this location. The worst-case month for the onshore substation construction activities occurs between months 19 and 25 when there are up to 144 employees working on the substation.	No	The Applicant and NCC have agreed in principle (at a meeting on the 31 March 2022) the proposed access designs for the onshore substation from the A140 and Mangreen Lane. These outline designs are provided within the **Transport Assessment** (document reference 9.2.24.1) submitted with the Development Consent Order Application.
Norfolk County Council	Appendix 1 – Detailed Comments Local Highway Issues and Comments Highway Comment 5 The TA for Hornsea 3 windfarm indicated the A140 and B1113 junction is already operating at capacity. In addition, the workforce associated with the	No	The Applicant has confirmed to Norfolk County Council (NCC) at an Expert Topic Group (ETG) meeting (on 13 July 2021) that access to the onshore substation would not be taken from the

	Hornsea 3 substation will utilise this junction. Permission has also been granted for commercial land use which will alter the junction alignment. Further assessment will be needed to show cumulative impacts. Four onshore substation transformers are required (Length: 11.6m Width: 4.7m Height: 4.6m Weight: 224 tonnes) which need to be transported by Abnormal Indivisible Load (AILs). An AIL Study will be included with the DCO but no AILs will route via the A140/ B1113 junction.		B1113 and would instead be taken from the A140. This access strategy, removes the requirement for abnormal indivisible loads (AILs) and onshore substation construction traffic to traverse the B1113/A140 junction. It was agreed with NCC at the ETG meeting that no further assessment of DEP and SEP traffic upon the B1113/A140 junction would therefore be required. An AIL study is provided as **appendix 24.2** of **ES Chapter 24 Traffic and Transport** (document reference 6.3.24.2) of the Development Consent Order application. The AIL study assess the potential impacts of moving the onshore substation transformers.
Norfolk County Council	Appendix 1 – Detailed Comments Local Highway Issues and Comments Highway Comment 6 Permission has been granted for commercial land use at the junction of the A140 with the B1113 making access difficult for AIL's. The PEIR states that Section 26.4.3.1.9 of the document provides	No	With regard to abnormal indivisible loads and the A140/B1113 junction, please refer to the response above. With regard to the proposed compounds, the Applicant and

	details of the routes to be used by AILs but this section appears to be missing. Temporary Construction Compounds (TCC) will be close to main A roads wherever possible and away from population centres to reduce impact on local communities. Five TCCs are to be shown graphically on Figure 26.4: - • Compound 1, located at the landfall; • Compound 2, located at Bodum; • Compound 3, located south of Oulton on the B1149; • Compound 4, located on Hethersett Road; and • Compound 5 located at the substation.		Norfolk County Council have discussed (at a meeting on the 13 July 2021) those locations where outline designs should be developed. Designs for these locations were agreed in principle at a meeting on the 31 March 2022. Outline designs for these locations are provided within the **Transport Assessment** (document reference 9.2.24.1) submitted with the Development Consent Order Application.
Norfolk County Council	Appendix 1 – Detailed Comments Local Highway Issues and Comments Highway Comment 7 We have previously indicated that if Oulton is to be considered as a location for a compound that traffic impacts need to be investigated. We are unable to identify the proposed compounds on Figure 26.4 and further clarification is required. The onshore cable corridor would cross approximately 56 roads. The final crossing types and locations will be reported within the DCO, however the DCO will contain a commitment to trenchless cross the A11, A47, A148, A149, A1067, B1145, B1149, B1354, Old Fakenham Road and the Norwich Western Link Road (not yet constructed).	No	The Applicant and Norfolk County Council (NCC) have discussed and agreed these issues at an Expert Topic Group meeting on 13 July 2021. During the ETG meeting the issues in relation to the use of Oulton Airfield were discussed, and it was confirmed that trenchless crossings will be provided at all locations identified by NCC. Subsequent to the ETG meeting, the Applicant can confirm that Oulton Airfield is no longer being considered as an

			option for the location of the main compound.
Norfolk County Council	Appendix 1 – Detailed Comments Local Highway Issues and Comments Highway Comment 8 Officers have previously asked for Taverham Road, Inkwood Lane, Ringland Lane and Oulton Street to be included in the list of trenchless crossings and are assessing the impact of their omission. An Outline Traffic Management Plan (OTMP) and Outline Travel Plan (TP) will be submitted as part of the (DCO) and then completed when the contractor is appointed. The OTMP will include details of a liaison strategy and measures for seasonal sensitivities/event planning. The DCO will also contain a commitment to undertake pre-condition surveys of all routes so that any damage can be identified during the works and rectified by the developer.	No	Please refer to the Applicant's response to Norfolk County Council above which provides an overview of the agreed approach (between the Applicant and Norfolk County Council) in relation to trenchless crossings. The Applicant confirms that the **Outline Construction Traffic Management Plan** (document reference 9.16) submitted with the Development Consent Order application includes details of a liaison strategy, measures to address seasonal sensitivities/events and a commitment to pre-condition surveys and repairs.
Norfolk County Council	Appendix 1 – Detailed Comments Local Highway Issues and Comments Highway Comment 9 It is agreed that assessing the impact in this manner is appropriate.	No	Noted, no response required.

	Details of the currently anticipated construction programme for projects likely to have a cumulative impact are included in the PEIR, together with an indication of when the peak period for deliveries are expected to occur and how this could overlap with DEP and SEP.		
Norfolk County Council	Appendix 1 – Detailed Comments Local Highway Issues and Comments Highway Comment 10 It is agreed the correct projects have been identified, however officers are still considering the cumulative impact assessments. See also highway comment 5 above regarding cumulative impacts for the A140/B1113 junction.	No	The Applicant welcomes confirmation from Norfolk County Council that the list of cumulative projects is appropriate. With reference to comments regarding the A140/B1113 junction, please refer to the Applicant's previous response to Norfolk County Council in relation to this junction.
Norfolk County Council	Appendix 1 – Detailed Comments Wider Strategic Highway Issues Highways England (HE) has proposed six highway improvement schemes for the A47 as part of the Road Investment Strategy (RIS). The schemes that could potentially impact on the TTSA are: - • A47 North Tuddenham to Easton RIS; • A47 Blofield to North Burlingham RIS; and • 47/A11 Thickthorn junction improvement RIS.	No	Please refer to the Applicant's response to Norfolk County Council at page 508.
Norfolk County Council	Highway Comment 11 HE has requested that the inter-relationship between the A47 Corridor Improvement programme and DEP/SEP be investigated and this will be assessed by HE.	No	Noted, no response required.

	The construction of the proposed A47 Great Yarmouth Junction Improvements Including Reconstruction of the Vauxhall Roundabout RIS is projected to start by 2023/2024 and should be complete by 2024/2025 prior to the commencement of the Projects' construction. However, HE noted that the scheme has been paused pending a review. A review of the project will be undertaken prior to submission of the DCO application. This will be assessed by HE.		
Norfolk County Council	Highway Comment 12 It is anticipated that the construction works associated with the Great Yarmouth third river crossing will be completed prior to commencement of the Project's construction phase. A review of the project will be undertaken prior to submission of the DCO application.	No	Noted, no response required.
Norfolk County Council	Highway Comment 13 It is agreed that assessing the impact in this manner is appropriate. There is potential for the construction traffic associated with the Norwich western link to interact with DEP and SEP. In addition, the new road layout would provide alternative routes for the Projects construction traffic.	No	Noted, no response required.

Norfolk County Council	Highway Comment 14 The County Council, as LHA is working closely with the applicant on the above matters. The applicant is asked to ensure that their underground Cable Route does not fetter any future highway improvement schemes in Norfolk i.e. the Norwich Western Link and that where any reinforcement or diversion is needed to the cable route as a result of such highway works, they will be responsible for any upgrades or diversion of the cables and will fully meet the costs of these works.		Please refer to the Applicant's response to Norfolk County Council at page 508.
North Norfolk District Council (NNDC)	Chapter 26 - Traffic and Transport In respect of traffic and transport North Norfolk District Council defer such matters of consideration to Norfolk County Council, who are the Highway Authority covering North Norfolk and who are the technical experts who would normally give highway advice to the District Council.	No	Noted, no response required.
Ørsted Hornsea Project Three	1.3 Onshore Oulton 1.3.1 Ørsted notes the location of the main compound is yet to be confirmed and welcomes updates and consultation with Equinor once this has been established. Equinor's PEIR boundary shows that there is currently interaction at the bellmouth of Hornsea Three's access to the main compound, off The Street, Oulton. The location of Equinor's project in this area is also likely to give rise for the need to co-operate and align in relation to potential traffic	No	Following submission of the PEIR the Applicant has confirmed that a main compound would not be located at Oulton Airfield. Access would however be required from the Street to serve the construction of the onshore cable route. The Applicant is aware of the requirement for Ørsted to upgrade The Street and would be willing to co-operate and align

	and transport impacts. Ørsted would welcome further discussion on this.		proposals for DEP and SEP to manage potential cumulative traffic and transport impacts. The Outline Construction Traffic Management Plan (document reference 9.16) submitted with the Development Consent Order application includes a commitment to working with Ørsted in this regard.
Ørsted Hornsea Project Three	Norwich Main and Equinor's proposed substation area(s): 1.3.6 Ørsted notes Equinor's temporary access routes cross over Hornsea Three's 400kV connection area at multiple locations south of Mangreen Lane, en route to Hornsea Three's connection to National Grid's Norwich Main substation. In particular, Ørsted would like to discuss the types of loads likely to use these accesses, noting that they have the potential to be larger if serving Equinor's final substation location. As such, additional protections for Hornsea Three's cables may be required.	No	The Applicant are still finalising the route of the access to the onshore substation. Once a final decision has been made, should there be an interaction with Hornsea Project Three, the Applicant will engage with Ørsted to discuss the appropriate means to protect any buried cables.
Oulton Parish Council	1. The cable corridor route and crossover point 1. a) Oulton Parish Council needs urgent clarification on the route of the cable corridor, as it comes through the southern end of Oulton Street, especially in light of the recent refusal by Broadland District Council of the solar farm planning	No	The Applicant responds to each of the points as follows: With regard to the crossing of The Street, the Applicant can confirm that trenchless technology, such

	application. It is noted that, on the cable crossing document, cables belonging to Norfolk Vanguard/ Boreas have not been included (cumulative impact Oulton). The cable crossing of The Street, Oulton (**driver delay diversion map figure 2) needs clarification: on the map it appears to be near to the entrance to Equinor's proposed construction compound, which is the same as the entrance to Ørsted's Main Construction Compound. This cable crossing is proposed to be open cut. It is noted that NCC Highways have requested that HDD be used in the case of Oulton: this needs confirmation. This is not where OPC anticipated the cable route would be sited: is this the final location? The closure of The Street, Oulton, during open-cut trenching would be highly problematic as this would cut off the village of Oulton Street, and in addition need to be finely coordinated with the construction imperatives of Hornsea Project Three and Norfolk Vanguard/Boreas. The eventual construction windows will be crucial in terms of the construction imperatives and constraints, as this is the main access route to the Holt Road for the Main Construction Compounds for all the projects. Open-cut trenching across The Street: Highway mitigation measures would be in place as part of the DCO for Hornsea Three and Vanguard/Boreas, requiring highway modifications,		as, Horizontal Directional Drilling (HDD) will be utilised to install the DEP and SEP cables under the road. This type of technology allows cables to be installed under roads without them needing to be closed and therefore minimises the disruption to the travelling public. See the **Works Plan** (document reference 2.6) With regard to potential for cumulative impacts, section 24.7 of **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) includes a detailed cumulative impact assessment (CIA) of the potential for cumulative impacts with Hornsea Project Three and Norfolk Vanguard/Boreas. With specific regard to the B1149, the CIA identifies that Norfolk County Council have agreed cumulative HGV caps with Hornsea Project Three and Norfolk Vanguard/Boreas and confirms that SEP and DEP would

	including the formalization of temporary passing places. Open-cut trenching would interfere with these modifications. There is also an issue of residents being cut off from emergency vehicles. With so many projects potentially overlapping there is a danger of the road closures and diversions bringing the highway network to a complete standstill, especially at this central section of ALL of the proposed projects. Link 131: Equinor have mapped routes (figure 2) which will be subject to cumulative impacts and it is noted that (correctly) The Street is one such access route which will be impacted by Hornsea Project Three, Norfolk Vanguard/Boreas and SEP&DEP. However, we also note that some sections of the B1149 (the Holt Road) on the map appear as if they are impacted only by Vanguard/Boreas and exclude Hornsea Project Three, when this is not the case. To access The Street ALL vehicles from ALL Projects will travel along the entire B1149 to get to The Street. It is noted that there will be a peak hourly rate of 92 LCVs and 3 HGVs, giving a percentage increase of 45%. This is a smaller increase than was given for Ørsted and Vattenfall, so we can only assume that The Street traffic number increase from the other projects has changed the percentage rating - yet the road is not an A or B road and is being put forward		comply with these established caps. The Outline Construction Traffic Management Plan (document reference 9.16) submitted with the Development Consent Order application includes details of how the SEP and DEP would comply with these agreed caps.

	as being able to perform as such to accommodate yet more traffic.		
Oulton Parish Council	1. The cable corridor route and crossover point 1. b) The western part of Oulton will see construction traffic along very narrow rural roads in order to create a one-way system for construction. Please explain the rationale for this, especially as Equinor have proposed the use of the haul road as a means to cut down on construction traffic using the highway network. This latter suggestion is hard for us to understand, as we know that the haul road will be constructed – and removed – in sections. The other wind farm projects have been at pains to explain to us that it will simply not be practical to use the haul road for anything other than very temporary purposes. Link 56: Spinks Lane access to Cawston roundabout (B1145) is wrong, and will generate a cumulative impact with Norfolk Vanguard/Boreas AND Hornsea Project Three (HP3). This section of the B1149 will be used for their cable drum deliveries and HGVs to and from their Main Construction Compound. All of HP3's construction materials are stored at their Main Construction Compound and will come in and out and along the B1149 in both directions.	No	The Applicant responds to each of the points as follows: Following submission of the PEIR the Applicant has revised the access strategy in the vicinity of Oulton to remove the proposed access from Spa Lane. Alternative access would be provided from the north via the B1354 and the south from the B1149. This access strategy would be facilitated by a proposed haul road and would ensure no SEP and DEP HGV traffic would travel via Oulton Village. An **Outline Construction Traffic Management Plan** (CTMP) (document reference 9.16) is submitted with the Development Consent Order application. The outline CTMP includes measures to ensure that HGVs comply with the assessed routes and that

	Link 57 (access to C24/25 on cable route): It is noted that, on the cumulative impact map, from Saxthorpe roundabout to Blickling Road is marked as having 'no cumulative projects'. This is not true: Blickling Road is Link 75 for the Norfolk Vanguard and Boreas projects. HGVs will access their cable route along this road, which crosses the Blickling road. Equinor are proposing a construction medium peak along this section of 60-100 vehicles: this will represent a highly significant cumulative impact with Vanguard/Boreas. Link 55 Spinks Lane: It is proposed that this route will see an hourly peak rate of 92 LCVs and 0 HGVs along this route. This would represent a percentage increase of 170% in traffic along a singletrack rural road and yet is flagged as Low Sensitivity. What is the rationale for this assessment? As with link 55, Link 156 is also a single-track road with an hourly peak rate of 92 LVCs and - curiously - 1.4 HGVs. An increase of 651% in all vehicles, and a 1330% increase in HGVs has resulted in this route being designated as being of High Sensitivity. The disparity between the sensitivity ratings would appear to be generated by the fact that on one route there will be some HGVs. It should be noted that, even with LCVs, these single-track roads would be problematic - especially if they encounter agricultural vehicles. Equinor's		vehicle numbers do not exceed the levels assessed. In regard to the assessment of potential cumulative impacts, please refer to the Applicants response on page 520.

	proposed use of the haul road is being put forward as a means to reduce traffic on the highway network yet, looking at the maps and traffic numbers for Links 55 and156, this looks like using small rural roads as a one-way system in and out of the haul road.		
Oulton Parish Council	3. Cable Drums If Oulton is used as a Main Compound, how will cable drum deliveries interact with Hornsea Three's AILs along B1149/The Street and the wider highway network? Hornsea Three have currently proposed 1,121 cable drum deliveries - and Vattenfall has its Cable Logistics Area in Oulton, which will see further delivery of cable drums and storage. As Equinor are aware, Hornsea Three's main construction compound would be sited on the former runways to the north & west of the SEP/DEP proposed compound. HP3 & SEP&DEP would share an entrance, both projects accessing 1km along The Street from B1149, along with Norfolk Vanguard /Boreas to their respective mobilisation area and cable logistics area. Ørsted Hornsea Three Table 2.1 (see above). Regarding Link 208, the total number of cable drum movements associated with the construction of Hornsea Three is 1,121, which would affect The Street twice, as they would enter the compound from source and then leave again to the relevant cable section. The maximum anticipated number of	No	The Applicant can confirm that Oulton Airfield will not be used as a main compound or for the storage of cable drums.

	abnormal loads for Link 208 is therefore 2242 total abnormal load movements.		
Oulton Parish Council	4. Highway Intervention Scheme Hornsea Three have had to mitigate for their traffic numbers, either in isolation or cumulatively with Norfolk Vanguard/Boreas, by way of a Highway Intervention Scheme (HIS), along the whole 1km of the southern end of The Street. The highway mitigation forms part of the DCO for all of the projects. This was to accommodate Abnormal Loads to and from the HP3 compound and two-way HGV and other traffic. Equinor in their PEIR documents have suggested further highway mitigation for The Street in the form of widening the road to a full 2-lane width along its whole length. This would be completely unacceptable. Not only would it result in the loss of many mature trees and important hedgerows, it would speed up traffic and leave an unacceptable legacy in the form of a permanent industrial slip-road as the entrance to our village, instead of the current quiet country lane. The HIS provides for 8 passing places, improved width at the bend half way along the 1km route, junction widening, the railway hump smoothing,	No	The Applicant can confirm that Oulton Airfield is no longer proposed as a location for a main compound. However, it is proposed that there will be a temporary access from The Street to allow access for Horizontal Directional Drilling (HDD) equipment to facilitate the DEP and SEP cables to be installed under The Street and the B1149. **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) includes details of the volumes of traffic that could be expected to pass along the Street (link 131). To ensure that HGVs can negotiate this link, **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) identifies the requirement for mitigation measures to manage HGV movements. An **Outline Construction Traffic**

	priority signage at the railway hump and a 30mph speed limit along the 1km of The Street. There was also to be a private arrangement for further mitigation with The Old Railway Gatehouse, to mitigation for cumulative noise impacts at this property. The mitigation scheme also agreed that the first project to construction would proceed with the mitigation scheme, with the last to construct decommissioning all of the temporary part of the scheme. The HIS requires a financial, as well as a "first in, last out" agreement amongst the developers for construction and decommissioning of the mitigation. Have Equinor made an agreement with Ørsted and Vattenfall over how this should be carried out?		**Management Plan (CTMP)** (document reference 9.16) is submitted with the Development Consent Order application. The outline CTMP includes measures to ensure: • HGVs comply with the assessed routes; • vehicle numbers do not exceed the levels assessed; and • HGVs can safely manoeuvre along the link. The **Outline Construction Traffic Management Plan** (document reference 9.16) submitted with the Development Consent Order application includes a commitment to working with Equinor and Ørsted to deliver mitigation measures.
Oulton Parish Council	5. Traffic Data When will full traffic numbers be available for: a) Main Construction Compound b) All links over a 12-hour working day? Oulton Parish Council believes there is a serious under-estimation of cumulative traffic impacts. Given	No	The Applicant has undertaken further consultation in regard to the main compound. The Preliminary Environmental Information Report (PEIR) contained sufficient information to

	the limited traffic data provided by Equinor, it is hard to assess the cumulative impacts with the other projects, or understand how the local highway network could cope. It is also true that Oulton already has large volumes of agricultural HGV traffic as a baseline. It is noted that in the traffic data provided in the PEIR documents only peak traffic numbers are referred to. OPC questions what are the full traffic numbers for the rest of the working day? It is also noted that there are no traffic data for compound traffic, so further numbers need to be included. There is also some doubt over the proposed timelines for all projects given the delay on Norfolk Vanguard/Boreas which may cause a change in construction periods, thus further increasing cumulative impacts.		enable stakeholders to form a view of the likely significant environmental effects of DEP and SEP. Chapter 26 of the PEIR (and associated figures and appendices) included comprehensive details of baseline traffic flows and forecast construction flows for all links within the traffic and transport study area. The Applicant directs the Parish Council to Table 26.21 of the PEIR which includes a summary of the forecast daily traffic flows for all links. These baseline traffic data presented in the PEIR are compiled from surveys of all existing traffic movements, including agricultural traffic. The latest forecast for traffic flows are presented within **ES Chapter 24 Traffic and Transport** (document reference 6.1.24). In regard to the assessment of potential cumulative impacts, please refer to the Applicant's response at page 520.

Oulton Parish Council	HDVs: A definition of a Heavy Duty Vehicle appears in Appendix 24-Traffic Data. This is misleading as it is a different definition to the already stated LCVs & HGVs used in other traffic data. What if anything is the difference between an HDV and an HGV?	No	HDH (Heavy Duty Vehicle) is a broader categorisation of large vehicles which includes buses/coaches in addition to HGVs. Noting that no bus or coach demand is anticipated for the Projects, there is not a requirement to sub-divide the HDV category, and therefore the terms HGV and HDV (Heavy Duty Vehicle) can be considered to be interchangeable for the purpose of the Development Consent Order application. The air quality assessment uses the term HDV (heavy duty vehicle) as this aligns with their relevant guidance.
Royal Mail	Under section 35 of the Postal Services Act 2011, Royal Mail has been designated by Ofcom as a provider of the Universal Postal Service. Royal Mail is the only such provider in the United Kingdom. The Act provides that Ofcom's primary regulatory duty is to secure the provision of the Universal Postal Service. Ofcom discharges this duty by imposing regulatory conditions on Royal Mail, requiring it to provide the Universal Postal Service. Royal Mail's performance of the Universal Service Provider obligations is in the public interest and should not be affected detrimentally by any	No	Noted, no response required.

	statutorily authorised project. Accordingly, Royal Mail seeks to take all reasonable steps to protect its assets and operational interests from any potentially adverse impacts of proposed development. Royal Mail and its advisor BNP Paribas Real Estate have reviewed chapter 26 (Traffic and Transport) of the Preliminary Environmental Information Report (PEIR) via the link which is included within the consultation material. This infrastructure proposal has been identified as having potential for impact on Royal Mail operational interests. However, at this time Royal Mail is not able to provide a consultation response due to insufficient information being available to adequately assess the level of risk to its operation and the available mitigations for any risk. Therefore, Royal Mail wishes to reserve its position to submit a consultation response/s at a later stage in the consenting process and to give evidence at any future Public Examination, if required. In the meantime, any further consultation information on this infrastructure proposal and any questions of Royal Mail should be sent to: Holly Trotman (holly.trotman@royalmail.com), Senior Planning Lawyer, Royal Mail Group Limited Daniel Parry Jones (daniel.parry-jones@realestate.bnpparibas), Director, BNP Paribas Real Estate		

Suffolk County Council	Suffolk County Council as Local Highways Authority Port Activities SCC would recommend that any requirements or management plans are worded to include consultation with the local highway authorities responsible for the relevant port used for onshore and offshore construction or operation in case the these are not within the primary planning authorities areas (i.e. North Norfolk District Council/ Norfolk County Council). This is a similar approach to that taken for EA1(N) and EA2.		It is not possible at this stage to confirm ports for the off-shore construction and/or operation of DEP and SEP. Such facilities would likely be provided or brought into operation by means of one or more planning applications or as port operations with permitted development rights.
Suffolk County Council	Suffolk County Council as Local Highways Authority Abnormal Loads It is presumed the Applicant will endeavour to follow NPS1 guidance and priorities movement of large loads by sea. The location of the landfall, cable route and substations suggests Kings Lynn, Great Yarmouth or Lowestoft would be the main origin for onshore movements of AILs. If a port or route is selected within a neighbouring authority then we would expect the wording of any management plan to require consultation with that authority.	No	The Applicant can confirm that Kings Lynn is the preferred port for the import of the DEP and SEP transformers and as such, there would be no impact upon the Suffolk County Council road network associated with these AILs. Other AILs that may come by port would likely be limited to cable drums, the location of the port to be used for the import of cable drums cannot be confirmed at this stage. The Applicant can however, confirm that the **Outline Construction Traffic Management Plan** (document reference 9.16) submitted with the Development Consent Order

			application includes a commitment to liaison with the relevant highway and structures authorities (through which the load will move) as part of the established national ESDAL (Electronic Service Delivery for Abnormal Loads) process.
Suffolk County Council	Suffolk County Council as Local Highways Authority Freight Management Strategy The location of the substation to the south of Norwich may result in additional movements to and from the south via the A140 to the A14 in Suffolk. SCC would expect to be consulted on the freight management strategy and evidence provided to show that there are no significant impacts on the A140 or other routes in Suffolk.		**ES Chapter 24 Traffic and Transport** (document reference 6.1.24) submitted with the Development Consent Order application outlines that all HGV deliveries to the onshore substation would travel north on the A140 towards the A47, no HGV movements would be permitted to travel south on the A140. This routeing strategy is secured through the **Outline Construction Traffic Management Plan (CTMP)** (document reference 9.16) submitted with the Development Consent Order application.

Swardeston Parish Council	Swardeston Parish Council have determined to limit comments to matters around the Onshore Substation and the cable route within our parish and surrounds, being that area in which we have the appropriate knowledge to offer such guidance and criticism as the consultation warrants. No comments will be made on the efficacy of the consultation document as a whole, nor any hypothetical alternatives to the project or its termination at Norwich Main.	No	Noted.
Swardeston Parish Council	1. Traffic & Onshore Substation Site Access 1.1 Onshore Substation Vehicle Movements The Provisional Environmental Impact Report (PEIR) (Table 26.21 and Table 26.24) estimates some 175 HGVs entering and leaving the substation site daily (350 movements). In addition, there could be up to 234 LCVs (468 movements). Assuming a 10-hour working day, this equates to a peak hourly traffic flow of 35 HGVs and 234 LCVs into or out of the site (as it has been assumed in the document that all LCV movements take place during the first and final hours of the working day). With either up to 130 employees (Table 26.20) or 144 employees (26.6.1.4.2.225) working on or passing through the substation site it is vital that steps are taken to improve on the one employee per vehicle assumption to reduce LCV traffic flow. Given that the bulk of employee travel will take place during existing peak traffic hours this will result in	No	Following the publication of the Preliminary Environmental Information Report (PEIR), the Applicant can confirm that the option for an access to the onshore substation from the B1113 (to Swardeston) has been removed and the Applicant has committed to an access from the A140. This change would result in a significant reduction in the requirement for DEP and SEP construction traffic to travel via the B1113. With regard to employee traffic, in order to consider a worst case, the assessment of employee traffic movements within **ES Chapter 24 Traffic and**

	extensive additional traffic with inevitable delays and possible gridlock. Conclusion Introducing a car share scheme or a minibus shuttle service would be beneficial in dramatically reducing the number of LCVs entering and leaving the site every day, lessening the impact of the site works on pre-existing commuter and local traffic.		**Transport** (document reference 6.1.24) is based upon all employees driving themselves to work. This assumption provides a worst case for assessing impacts, however, it is typical for construction projects that employees will car-share, or travel in contractor provided minibuses (therefore reducing overall vehicle movements). The Applicant has submitted an **Outline Construction Traffic Management Plan (CTMP)** (document reference 9.16) with the Development Consent Order application. This outline CTMP includes travel plan measures that seek to reduce the number of single occupancy employee vehicle trips.
Swardeston Parish Council	1. Traffic & Onshore Substation Site Access 1.2 Onshore Substation Access The PEIR details four potential access points for the onshore substation site (C78A, C78B, C78C and C78D) described in Chapter 26.6.1.3.8 para 212 and shown on Figure 26.4 sheet 3 of 3 although in some parts of the PEIR there are only three access points	No	The Applicant can confirm that an access to the onshore substation from the B1113 is no longer proposed. The Applicant and Norfolk County Council have agreed in principle (at a meeting on the 31 March 2022) proposed access designs for the onshore

	with C78D missing. Despite this, the map on page 42 of the Onshore Works Plan and also that forming part of the Online Exhibition and featuring in recent webinar presentations, shows five potential access points. Given that C78A and C78D are in different locations on the two maps we can best comment on these different access points by description. 1.2.1 Access off the A140 via the quarry. We will not presume to comment on the feasibility of using this route through the actual quarry but the access road into it from the A140 was specifically designed to take the type of HGV mainly being used on this project. Our concern relates to the rush-hour traffic flow of 35 HGVs plus 234 LCVs which equates to one vehicle every 14 seconds, assuming a one-way system is in place and the HGVs leave by a different access point. Given that the majority of these vehicles will arrive from the direction of the A47 and travelling south approximately 400m on the A140 they will then be turning right across the heavy rush-hour traffic travelling north towards Norwich on this road. Some form of traffic control, journey staggering or multioccupancy vehicle use will be essential to reduce this peak flow to a safe and workable figure and avoid queuing of traffic back to the A47 roundabout. However, given that access has to be gained somewhere this is probably, in our opinion, the best way into the substation site if feasible and would also provide a safe exit if a more desirable		substation from the A140 and Mangreen Lane. Details of the final access strategy is be provided within the **Transport Assessment** (document reference 9.2.24.1) that accompanies the Development Consent Order application.

	one-way system cannot be achieved. 1.2.2 Access off the A140 into the East end of Mangreen Lane. The comments in 1.2.1 regarding traffic volumes apply to this access also, being approximately 400m further south, but the entrance to Mangreen Lane from the A140 is sited at the top of a hill at the end of a blind bend for traffic travelling North on the A140. Although this short stretch of the A140 is subject to a 40mph speed limit as a railway bridge safety measure, this is generally accepted as widely ignored and traffic speeds can approach the national limit of 60mph at non-peak times. Having large numbers of slow-moving HGVs crossing such traffic is hazardous. 1.2.3 Access off the A140 into Bridle Road (Stoke Holy Cross BR3). Comments regarding traffic volumes as above. The gated access is narrow and would need a great deal of work to make it suitable for HGV access. Although the access is on a relatively straight stretch of road with good visibility the road has double white lines and no central right-turn lane. It could possibly be utilised as a “left-turn only” exit from the site but is not at all suitable as an entrance. 1.2.4 Access off the A140 into Hickling Lane. Comments regarding traffic volumes as above. This access has a reasonable splay onto the A140 and also has reasonable visibility in both directions. The road, at this point, has double white lines and no		

	central right-turn lane. It would serve only as a “left-turn only” exit for a one-way system but Hickling Lane and its railway bridge are too narrow and the bridge too close to its junction at the A140 to allow for safe two-way traffic management. 1.2.5 Access off the B1113 into a temporary access road alongside Mangreen Lane. It appears this road is being considered as an exit route for a one-way system in and out of the site but, despite only handling one-way traffic, the additional burden on the B1113 would be catastrophic. Given that it is likely this project will overlap Hornsea Project 3 (HP3), where all substation traffic (a significant number of HGV and LCV movements per day) is proposed to be using the B1113, periods of gridlock are inevitable. On the assumption that most of this traffic would then be heading north on the B1113 the B1113/A140 junction at Harford Bridges, which is already operating above capacity, subject to considerable queuing at peak times and to be impacted even further by HP3 traffic, simply is not capable of handling any further demand. This route would also heavily impact bridle roads Swardeston BR9 and BR12 which, being used by walkers and horse riders, would be highly desirable to maintain in use given the lengthy construction period of at least four years. The PEIR appears to rate the impact on these paths as major adverse and suggests “soft management”.		

	1.2.6 Access off the B1113 into Gowthorpe Lane. We have been advised that this is an error on Figure 26.4 sheet 3 where access C78D is shown in the wrong location. No further comments to be submitted on the basis that this is not a proposed access point, we reserve the right to make submissions at a later time if we have been incorrectly advised and this point is under consideration. Conclusion. In a number of places within their PEIR Equinor refer to HP3 as awaiting consent whereas consent was granted more than 3 months prior to PEIR publication. Given the developer's suggested construction windows for the onshore substations for both SEP and DEP and HP3, with the possibility that both projects could well be built in two consecutive phases it seems inevitable, should SEP and DEP receive consent, that substation construction for both projects will overlap to a considerable extent. In view of this, and the fact that HP3 plans to use the B1113 from the A140 (Harford) junction to the substation site south of the A140 for all traffic, any suggestion that SEP and DEP might use this same full-capacity B-class road for any traffic at all is unacceptable. The fact that a possible one-way exit route alongside Mangreen Lane onto the B1113 might form part of Equinor's traffic plan is inappropriate and should be discounted as a viable		

	option. The traffic volumes already proposed by HP3 will almost certainly gridlock the B1113/A140 (Harford) junction for large parts of each construction day which will severely impact both local and commuter traffic flows and traffic movement along the B1113 and at the B1113/A140 (Harford) junction cannot be added to.		
Weybourne Parish Council	Beach/Landfall • The village depends on tourism, especially in the peak April-October period, with the pub and shop, campsites, B&Bs and holiday lets and the North Norfolk Railway all vulnerable to the effects of any road closures and construction activity.	Yes	HDD crossings are planned for roads into Weybourne and the North Norfolk railway it is not anticipated that these transport routes will be closed.
Weybourne Parish Council	Traffic • WPC remains concerned about the size of delivery and construction vehicles and their frequency. • None of the roads in or through the village are suitable for HGVs, and particularly not for exceptional loads. • Holt Road is narrow and winding, with sharp bends and poor visibility. It culminates in a very difficult junction with Church Street, that is likely to be inaccessible for HGVs. • Church Street and the access onto the A149 is another pinch point that is likely to be problematic. • Sandy Hill Lane/Station Road is also a winding road with some sharp bends, and it narrows at the North Norfolk Railway crossing. In addition, the road	No	**ES Chapter 24 Traffic and Transport** (document reference 6.1.24) includes details of the volumes of traffic that could be expected to pass along link 10 (Holt Rd/Church St) and link 12(Sandy Hill Ln/Station Rd). To ensure that HGVs can safely negotiate along these links, Chapter 24 Traffic and Transport (document reference 6.1.24) identifies the requirement for mitigation measures to manage HGV movements.

	is used by campervans and cars towing caravans, and there are limited passing places where HGVs could cross with these vehicles.		An Outline Construction Traffic Management Plan (CTMP) (document reference 9.16) is submitted with the Development Consent Order application. The outline CTMP includes measures to ensure that HGVs comply with the assessed routes, that vehicle numbers do not exceed the levels assessed and measures (such as the use of pilot/escort vehicles or passing places) are provided to ensure HGVs can safely manoeuvre along links 10 and 12.
Weybourne Parish Council	Road Closures • There are four routes into the village. It is essential that only one is closed at any one time, and for the minimum amount of time. • Road closures must avoid the key tourist season as well as critical times for agricultural work.	No	It is not proposed that any of the routes into Weybourne Village will be closed. The A149, Holt Road, and Station Road will be crossed using HDD, which negate road closures.
Weybourne Parish Council	The A149 • Although this is a main A road, it is narrow, with a number of flint buildings directly on the edge of the road, meaning it is not suitable for heavy use by HGVs. • The road becomes extremely busy during the tourist season, and traffic queues are likely to build up very rapidly if there are issues of HGVs on both	No	**Section 24.5** of **ES Chapter 24 Traffic and Transport** (document reference 6.1.24) contains a characterisation of the existing environment in relation to traffic and transport to enable the potential impacts of DEP and SEP traffic to be determined. The

	sides of the road. • There are no pavements along the A149 through most of the village, but the road is regularly used both by local residents and by visiting walkers. As the road is very narrow, the presence of HGVs could cause hazards to pedestrians. • Equinor has committed to using HDD under the A149, but WPC is still concerned that this could create some disruption. There is no information on what sort of disruption HDD crossings are likely to cause.		sensitivity of the A149 through Weybourne (link 9) is assessed to be of 'high' sensitivity. The identified sensitivities have been fundamental in determining the potential impacts of DEP and SEP traffic demand and mitigation strategy as set out in **Section 24.6** of **ES Chapter 24 Traffic and Transport** (document reference 6.1.24). With regard to Horizontal Directional Drilling impacts, please refer to the Applicants response to Cley-next-the-sea Parish Council.
Weybourne Parish Council	Crossing Holt Road • According to the maps associated with the PEIR, Equinor plans to bring the cables across Holt Road, one of the routes into the village. • This has a difficult sharp bend, with poor visibility and high banks. • Trenchless HDD would be the preferred method.	Yes	The Applicant can confirm that Holt Road will be crossed using a HDD trenchless crossing technique.

24 Landscape and Visual Impact Assessment

Consultee	Comment	Development Change?	Response
Norfolk Coast Partnership	Onshore construction compounds "Woodforde Farm unsuitable – too far from route and substandard access."	Yes	Woodforde Farm has not been taken forward as the main construction compound location.
Norfolk Coast Partnership	Landfall "We are very concerned about the visual impact and physical disturbance in the AONB During and after construction. This is a sensitive area in terms of biodiversity and landscape. There could be adverse knock on effects for farmers, fishermen, tourism, local people and visitors, sensitive species, adverse visual impact from movement, traffic and lighting. As a nationally designated landscape we would have preferred Bacton and difficult to see how impact can be mitigated here."	No	Potential effects on landscape and visual receptors at the landfall are assessed in **Section 26.6.2** of **ES Chapter 24 Landscape and Visual Impact Assessment** (document reference 6.1.24).
Norfolk Coast Partnership	Onshore Substation Access "Please pprox. the Norfolk Biodiversity Information Service to conduct searches on species and also refer to the Green Infrastructure Strategy. Is there a plan to mitigate impact or a potential community project which could be funded to provide access / biodiversity enhancement"	No	These services are not relevant to the purposes of the LVIA but have been considered (where relevant) within the **OLMP** and **OEMP** (document reference 9.18 and 9.19). The **OLMP** presents the key landscape principles and

			proposals to minimise impacts and provide screening. These landscape proposals form part of the embedded mitigation measures that are considered in the assessment of effects in **Section 26.6** of **ES Chapter 24 Landscape and Visual Impact Assessment** (document reference 6.1.24).
Norfolk County Council	"…we would expect to see phased and layered planting around the substation sites to afford long distance screening in the landscape without creating block planting that will not appear congruent with the landscape. As well as losses pprox. where possible and suitable mitigation proposed, we would support a "no net loss" approach. "	No	The **OLMP** (document reference 9.18) presents the key landscape principles and proposals to minimise impacts and provide screening. These landscape proposals form part of the embedded mitigation measures that are considered in the assessment of effects in **Section 26.6** of **ES Chapter 24 Landscape and Visual Impact Assessment** (document reference 6.1.24).
	"We have concerns regarding the cumulative impacts on the landscape to the North West and West of Norwich where several proposals (albeit at different stages) are currently in discussion or in the planning system."	No	Cumulative impacts area assessed in **Section 26.7** of **ES Chapter 24 Landscape and Visual Impact Assessment** (document reference 6.1.24).

North Norfolk District Council	"NNDC would wish to work with Equinor in seeking to ensure the minimum amount of tree, hedge and shrub loss to facilitate the project. NNDC will also insist on a ten-year replacement period for trees, shrubs and hedgerows within North Norfolk which would need to be secured within any DCO consent. In respect of hedgerow and tree removal, retention, replacement and management NNDC would wish to work with Equinor in the production of the Outline Landscape and Ecological Management Strategy (OLEMS) to be submitted with the DCO."	No	The **OLMP** and the separate **OEMP** (document reference 9.18 and 9.19) presents how the SEP and/or DEP projects would minimise tree, hedge and shrub loss. New tree, hedgerow and shrub planting will be maintained and, if any fail, replaced for ten years following implementation of planting, as set out in the **OLMP** (document reference 9.18).
South Norfolk & Broadlands District Council	"…an assessment of the effects of any lighting should be undertaken"	No	The LVIA has taken into account the potential effects of lighting at night, as set out in **Section 26.4.6.2** of **ES Chapter 24 Landscape and Visual Impact Assessment** (document reference 6.1.24).
	"Policy DM4.5 of the South Norfolk Development Management Document does not protect the river valley landscape character per se, it is a general landscape character policy that requires particular regard for the rural river valleys; DM4.5 applies for all landscape character in South Norfolk."	No	This has been accounted for in **Sections 26.5** and **26.6** of **ES Chapter 24 Landscape and Visual Impact Assessment** (document reference 6.1.24) accordingly.

	“Land north of the Street Cawston has now been the subject of a planning application for a solar farm (ref: 20201776) which has been refused”	No	This has been noted. A review of the application’s status on Broadlands District Council’s website confirms that this application has been consented. As such, in accordance with the LVIA’s methodology, the consented scheme is treated as part of the baseline environment.

	"We will expect full tree survey information to be provided as part of the DCO submission and, where there is likely to be conflict with the proposed developments"	No	The **OLMP** (document reference 9.18), submitted as part of this DCO application, presents further design work and survey post-PEIR and sets out key landscape principles and proposals. Surveys undertaken include: • An assessment of hedges identified as 'important' in accordance with Hedgerows Regulations 1997 has been undertaken and submitted as part of this DCO application. • A detailed desk-based approach to assessing trees using aerial photography, in

	"A full hedgerow assessment has not been undertaken yet. An assessment of hedges identified as "important" in accordance with the Hedgerow Regulations 1997 [sic] will be submitted with the DCO."		addition to Phase One Habitat Survey data and Tree Preservation Order Data. • Arboricultural surveys were undertaken at key locations, i.e. in proximity to the substation and within the AONB, and is presented in the **Arboricultural Report** (document reference 6.3.20.15). This document: • Summarises the relevant legislation and national and local policies that relate to the protection of trees, hedgerows and woodlands;

	"The ability of landowners to veto replacement planting is potentially an issue."		• Provides the results of the desk study within the entire DCO boundary; • Provides the results of the arboricultural surveys within the North Norfolk AONB and Norwich substation areas, which have been used to inform proposals; • Advises on how arboricultural impacts can be avoided through sensitive detailed design and best practice construction methods; and • Advises, where potential impacts cannot be avoided, on how mitigation and compensation could be provided in addition to any legislative barriers to tree work. Mitigation (replanting) will be secured by the Requirements in the DCO through the

			relevant management plans that will be submitted to and approved by the local planning authority. Where rights or land are acquired permanently under the DCO, this will extend to control over planting/mitigation where that has been specified in the Book of Reference. It is also possible to enter onto land to carry out mitigation works (including replacement planting) by relying on the temporary possession powers included in the DCO. The temporary possession powers make specific provision for carrying out mitigation works and for those mitigation works to remain on the land after the period of temporary possession ends.

25 Socioeconomics and Tourism

Consultee	Comment	Development Change?	Response
East Suffolk Council	The council do not anticipate any significant cumulative impacts on tourism. The CIA table states that EA1N is scheduled for construction completion in 2020, however this is not correct as it together with the EA2 offshore wind farm project are currently approaching the final stages of the DCO Examination process and have yet to be approved.	No	The Application for East Anglia ONE North was submitted to the Planning Inspectorate in October 2019 the DCO was consented in March 2022. This is set out in **Section 27.7** of **ES Chapter 27 Socio-Economics and Tourism** (document reference 6.1.27).
East Suffolk Council	It is important that the potential positive and negative cumulative socio-economic effects are fully taken into consideration. For example there is the potential for there to be cumulative effects in relation to labour particularly in relation to offshore employment dependent on the 'load out' port specified and if the construction phases of the projects overlap. If the projects are built sequentially this would contribute to a pipeline of projects providing continuous employment.	No	Lowestoft and Felixstowe are the main ports that could be considered in Suffolk. The assessment considers that a port could have the potential to be used concurrently or sequentially depending on the development scenario. The assessment approach is set out in **Section 27.4** of **ES Chapter 27 Socio-Economics and Tourism** (document reference 6.1.27).

East Suffolk Council	Sizewell C is included and it is highlighted that this project may interact with some receptors, in particular in-migration of non-home based workers, reaching as far north as Lowestoft. East Suffolk Council agree that there could be a cumulative impact in this regard with ongoing assessment and monitoring being recommended. The Applicant for Sizewell C proposes workforce attending from a 90 minute radius.	No	It is common practice for major construction projects to use 90-minute travel to works areas (TTWA) for home based and 60-minute for non-home based construction workers. This approach is set out in **Section 27.4** of **ES Chapter 27 Socio-Economics and Tourism** (document reference 6.1.27).
East Suffolk Council	It is stated that the Nautilus Interconnector project impact area is not anticipated to overlap with the study area associated with SEP and DEP. Once further information is available on this project this will need to be reconsidered. No mention is made to National Grid Ventures' Eurolink interconnector project which appears to have been omitted.	No	The list of cumulative sites has been reviewed and is presented in **Section 27.7** of **ES Chapter 27 Socio-Economics and Tourism** (document reference 6.1.27). The Nautilus application is expected to be submitted to the Planning Inspectorate in Q2 2023. As such there is limited information available at this stage. However, Nautilus will include underground cabling works and onshore infrastructure which will be located in East Suffolk.

			The Eurolink interconnector is still at very early stages of development and therefore there is a lack of information to include this in the assessment.
Norfolk County Council	There are potentially significant economic benefits that may arise from the SEP and DEP in terms of: • Local employment creation; • Business sectors affected by construction; and • Operations and Maintenance (O&M) of the wind turbines. County Council officers have had good engagement with Equinor in terms of maximising the wider economic benefits from the projects. The County Council expect and support the longer-term operations and maintenance benefits to be experienced locally. In addition, the County Council would be keen for the project to enable/encourage manufacturing to be attracted to Norfolk. The County Council is working with all energy companies and the New Anglia LEP to promote the energy sector and develop a Skills Strategy for the types of skills required for young people in schools and colleges. In addition, the County Council is working to create: • Apprenticeships, • Work experience; and • Internship opportunities at an appropriate stage.	No	Equinor have developed a basis for promoting local economic benefits as part of the **Outline Skills and Employment Strategy** (document reference 9.23) (which in turn will be informed to some extent by the Contract for Difference Supply Chain Plan). The **Outline Skills and Employment Strategy** sets out the basis for working with local stakeholders (public sector, industry, education etc) in order to maximise skills and employability outcomes for host communities.

	It is felt that the given the scale of these proposals and potential disruption it may cause to local communities and business that there should be suitable local community benefits arising and appropriate compensation for local businesses.		
Norfolk County Council	The County Council welcome, on economic development grounds, the decision to use the Port facilities at Great Yarmouth for: • Construction; assembly and manufacture of windfarm components; and • Operations and maintenance. The County Council would wish to see the applicant develop through the DCO process an Employment and Skills Strategy. Equinor should set out clearly in the following application stage and the accompanying Environmental Statement (ES): (a) how local communities impacted by the onshore construction (e.g. Cable Route and Substation) can have such impacts mitigated; and (b) the need for a “local community fund” to assist the wider community affected by the proposal. Equinor should, given the potentially long timescales for construction address the cumulative impact/s on local businesses and communities and provide appropriate compensation for those businesses and communities adversely affected by the construction works.	No	An **Outline Skills and Employment Strategy** document reference 9.23) has been developed as part of the DCO process. The ES considers a wide range of potential construction phase impacts, including impacts from traffic and transport (see **ES Chapter 24 Traffic and Transport** (document reference 6.1.24)) and noise (see **ES Chapter 23 Noise and Vibration** (document reference 6.1.23)). Mitigation measures are identified within each assessment to reduce or eliminate any predicted significant adverse effects. This assessment has been updated during the preparation of the ES, identifying mitigation

			measures that contribute to the avoidance of significant adverse effects to socio-economics and tourism. The ES does not conclude there is a need for a community benefit fund as a form of mitigation for potential impacts resulting from the construction of SEP and DEP. The potential benefits of any community funds which may be associated with SEP and DEP will form part of the Applicant's stakeholder engagement with local communities as the projects are matured. The **Outline Skills and Employment Plan** (document reference 9.23) sets out Equinor's intention to deliver benefits to the local community.
North Norfolk District Council	The delivery and construction of these projects has the potential to cause some disturbance, albeit on a relatively temporary nature, to residents and business interests within	No	Please refer to the response above.

	North Norfolk. North Norfolk District Council would therefore wish to work with Equinor to find acceptable solutions to properly avoid, mitigate or compensate for any adverse impacts that may arise. The council welcome further discussion both within the remit of the DCO consent process but also outside of the DCO consent process to discuss community benefit schemes and other benefits that this project can bring to North Norfolk.		
Public Health England	The local community will experience impacts from a range of factors due to cumulative development over an extended period. The range of impacts over such a long period may result in minor effects gaining increased significance to local communities and the vulnerable population within. These schemes will have particular importance to the assessment of construction staff accommodation needs, traffic and transport and the impact on the local health care system and community cohesion from the introduction of a large external workforce across a number of infrastructure schemes. These potential impacts have been acknowledged within the PEIR but have not been adequately assessed and considered not significant partly on the basis that any impact or effects are temporary. Chapter 29 identifies 670 non home-based workers and makes a worst-case assumption that half of these workers will require local accommodation. There is no justification for this assumption.	No	The increased demand brought to local hospitality and accommodation businesses resulting from construction workers is considered in **Section 27.6** of **ES Chapter 27 Socio-Economics and Tourism** (document reference 6.1.27). The assumption that half of the non-home-based workers will require local accommodation (see **Section 27.6** of **ES Chapter 27 Socio-Economics and Tourism** (document reference 6.1.27)) is a best estimate based on assumptions about the geographical distribution of

	The cumulative effects assessment within Chapter 29 does recognise impacts on accommodation but does not assess or use published assessments of accommodation availability (baseline and projected) to determine likely effects. The PEIR also notes the impact of increased in-migration on demographic change during construction is temporary, short-term and reversible in nature. Although temporary the construction period may extend to 24 months, with vulnerable populations being at risk of reduced access to affordable low-cost accommodation.		the supply chain. There is limited ex-post evidence available on this, but similar assumptions have been used and tested as part of the examinations for other offshore wind farms. Equinor's experience also suggests this is a reasonable assumption. It should be noted that the proportion of the local workforce requiring local accommodation will be dependent on procurement decisions that have not been made yet. Looking at East Anglia-based ports such as King's Lynn, Great Yarmouth, Lowestoft and Felixstowe and the travel times and availability of accommodation within 60 minutes provides justification for the assumption around non-home-based workers and local accommodation. Norwich is within 60 minutes travel time at peak hours from

			Great Yarmouth and Lowestoft. Felixstowe is close to Ipswich. The implication is that the non-home-based construction workers will have a large choice of accommodation across a hinterland within 60 minutes travel time of these ports. With regard to vulnerable populations potentially being at risk of reduced access to affordable accommodation, whilst there may be an overlap between the accommodation that construction workers may use and temporary accommodation used by homeless people it is expected that this impact would be limited.
Public Health England	The ES should provide greater justification for the number for non-home-based workers and the impact on availability of affordable short-term accommodation and the cumulative effects for the study area. Local knowledge on the potential impact from non-home-based workers should be sought from	No	Equinor have a robust plan to appreciate, through current, local, Labour Market intelligence (LMI), the labour shortages that exist and which

	local stakeholders, such as the local authority, public health and CCG/ICS teams. Should the applicant wish to scope out any of these recommendations from the ES, the applicant must provide justification. The applicant may wish to consider a figure within the ES to identify the location of relevant other projects in relation to the proposed project. While it is assumed by the applicant that any impacts of decommissioning are likely to be no greater than construction, the submitted documents do not provide robust justification in support of this assumption. The council would expect to see further information as to the decommissioning in the ES.		can provide opportunity for local employment. Equinor are collaborating over local skills and employability programmes that will maximise the number of home-based workers contributing to the construction phase of the programme. In areas where there has been an increase in work-based accommodation needs, the county has seen further business/ hotel developments (For example in Great Yarmouth). As noted above, looking at East Anglia-based ports such as King's Lynn, Great Yarmouth, Lowestoft and Felixstowe and the travel times and availability of accommodation within 60 minutes provides justification for the assumption around non-home-based workers and local accommodation. Norwich is within 60 minutes

			travel time at peak hours from Great Yarmouth and Lowestoft. Felixstowe is close to Ipswich. The implication is that the non-home-based construction workers will have a large choice of accommodation across a hinterland within 60 minutes travel time of these ports. **Figure 5.3** presented in **ES Chapter 5 EIA Methodology** (document reference 6.1.5) shows the onshore projects taken into account in the CIA whilst **Figure 5.1** and **Figure 5.2** presented in the same chapter show the offshore projects taken into account in the CIA. The approach taken to the assessment of the decommissioning stage is a common approach adopted in ES assessment of socio-economics due to the lack of information available at PEIR and ES stages about the cost

			and approach to decommissioning. It is reasonable to assume it is unlikely to have more significant effects than the construction phase.
Suffolk County Council	Pleased to see the recognition that the project will have wide reaching, significant economic impacts and welcome the socio economic assessment being conducted at a regional (New Anglia Study Area) alongside a national level. Norfolk and Suffolk are currently seeing an unprecedented amount of large, significant infrastructure construction and there are potentially significant economic benefits that the SEP and DEP proposals will contribute to in regards to: • Local employment both in the construction and operational phases • Local supply chain growth opportunities in the construction and operational phases • Ongoing growth supporting operations and maintenance Suffolk County Council alongside its Local Authority partners, New Anglia LEP and employer representative bodies have developed working relationships with all energy developers and applicants to ensure that the socio-economic benefits of hosting the construction of energy infrastructure projects and the long term legacy of operational energy infrastructure are maximised. The council expect the applicant and the SEP and	No	An **Outline Skills and Employment Plan** (document reference 9.23) has been developed as part of the DCO process. The cumulative impact assessment, which is set out in **Section 27.7** of **ES Chapter 27 Socio-Economics and Tourism** (document reference 6.1.27) has been revisited and the timelines of the projects set out in the CIA have been updated as necessary.

	DEP proposals to contribute to this ongoing activity and show demonstrable benefit. Suffolk County Council supports the ask for the applicant to develop, through the DCO process, an Employment and Skills strategy. The council has concerns that the cumulative impact assessment reaches invalid conclusions as the construction periods of a number of identified projects considered in the CIA are fundamentally wrong. Suffolk County Council expects the timelines to be corrected and Cumulative Impact to be reassessed. Whilst reassessing it is vital that the workforce assessment considers the different demands on the different phases of the proposals and assess these cumulatively with the projects identified in the CIA.		
Swainsthorpe Parish Council	During the sub stations construction and subsequent cable laying stages there will be significant disruption - will there be financial compensation for communities thus affected?	No	The ES considers a wide range of potential construction phase impacts, including impacts from traffic and transport (see **ES Chapter 24 Traffic and Transport** (document reference 6.1.24)) and noise (see **ES Chapter 23 Noise and Vibration** (document reference 6.1.23)). Mitigation measures are identified within each assessment to reduce or

			eliminate any predicted significant adverse effects. This assessment has been updated during the preparation of the ES, identifying mitigation measures that contribute to the avoidance of significant adverse effects to socio-economics and tourism. The ES does not conclude there is a need for a community benefit fund as a form of mitigation for potential impacts resulting from the construction of SEP and DEP. The potential benefits of any community funds which may be associated with SEP and DEP will form part of the Applicant's stakeholder engagement with local communities as the projects are matured.
Weybourne Parish Council	The village depends on tourism, especially in the peak April-October period, with the pub and shop, campsites, B&Bs and holiday lets and the North Norfolk Railway all vulnerable to the effects of any road closures and construction activity.	No	Equinor has made several commitments to reduce

			impacts on tourism within the area: • A Horizontal Directional Drill (HDD) at the landfall to minimise impacts to the beach and to keep access restrictions to an absolute minimum • Locating the landfall on private land, with access through the Muckleburgh estate only and no access via Beach lane • No compound for the onshore cable works will be located at the landfall • Weybourne Woods will be crossed using HDD to avoid closing Sandy Hill Lane and to reduce impacts to recreational users of the woods

			• A commitment to avoid closing any of the roads leading in and out of Weybourne • Enhanced measures within a Construction Traffic Management Plan (CTMP), such as a Community liaison officer to help effectively manage deliveries during local planned events (see **Outline Construction Traffic Management Plan** (document ref. 9.16).
Weybourne Parish Council	Weybourne is a working fishing village, with the fishermen launching from the beach.	No	The potential impacts to commercial fisher's has been assessed within **ES Appendix 14.1 Commercial Fisheries Technical Report** (document reference 6.3.14.1). A Fisheries Liaison Officer has been appointed by SEP and DEP who is managing communications with local

			fishers. A **Fisheries Liaison and Co-existence Plan** (document reference 9.8) has been drafted in consultation with relevant stakeholders which sets out a plan for continued and ongoing consultation
Weybourne Parish Council	There are plans for a Community Land Trust for a social housing project to be constructed on land adjacent to Station Road, north of the PEIR area.	No	Based on the planning map for North Norfolk, as per July 2022, none of the shown planning applications related to housing projects overlap with the SEP and DEP DCO boundary.
Weybourne Parish Council	The council believes there should be some form of targeted compensation for the disruption and worry caused by each windfarm that affects the village; this should also apply to other areas affected. Areas that are disproportionately affected (e.g. Weybourne and Cawston) should receive a greater "slice of the cake". Such funding could be used for projects to benefit the community as a whole e.g. toilets at Weybourne beach (if these have not been installed beforehand); funding for a "green" village hall; repairs to the carparking by the beach; contributions to the upkeep of village amenities such as the Harry Dawson Playing Field; the creation of a village "sustainability fund" that the Parish Council could use at its discretion to contribute to projects such as those listed above.	No	The ES considers a wide range of potential construction phase impacts, including impacts from traffic and transport (see **ES Chapter 24 Traffic and Transport** (document reference 6.1.24)) and noise (see **ES Chapter 23 Noise and Vibration** (document reference 6.1.23)). Mitigation measures are identified within each assessment to reduce or eliminate any predicted

	Norfolk-wide grant funding, or funding for STEM bursaries etc. do not directly benefit the communities that bear the brunt of the disruption. The village lies in an AONB. The presence of an industrial construction site and HGVs completely contradicts the ethos of an AONB. Outside the key tourist season, the beach and coast path are still heavily used by walkers, birdwatchers and anglers, and these bring in revenue to local businesses in the low season. Beach Lane is a narrow road, used by tourist traffic, local residents, local fishermen and the emergency services (Coastguard). It is not suitable for HGVs. Moreover, the presence of construction traffic would have a strongly adverse effect on tourism and local quality of life. Road closures must avoid the key tourist season as well as critical times for agricultural work. Any activity on Sandy Hill Lane would have a very significant impact on a number of businesses including Breck Farm (working farm and campsite), Weybourne Forest Lodges, Kelling Heath Holiday Park, North Norfolk Railway, Clive Hay-Smith's farm.		significant adverse effects. This assessment has been updated during the preparation of the ES, identifying mitigation measures that contribute to the avoidance of significant adverse effects to socio-economics and tourism. The ES does not conclude there is a need for a community benefit fund as a form of mitigation for potential impacts resulting from the construction of SEP and DEP. The potential benefits of any community funds which may be associated with SEP and DEP will form part of the Applicant's stakeholder engagement with local communities as the projects are matured.

26 Health

Consultee	Comment	Development Change?	Response
Public Health England (now OHID)	General comments applicable across the PEIR We note that other projects potentially having interactions and relevant cumulative effects have been identified. At this stage, only a brief discussion of each of the developments is presented and the cumulative effects do not appear to have been adequately assessed. We would expect a full evaluation of potential cumulative effects within the Environmental Statement (ES). The applicant may wish to consider a figure within the ES to identify the location of relevant other projects in relation to the proposed project.	No	The CIA is presented in **Section 28.7** of **ES Chapter 28 Health** (document reference 6.1.28).
Public Health England (now OHID)	General comments applicable across the PEIR There also appears to be little consideration for decommissioning. While it is assumed by the applicant that any impacts of decommissioning are likely to be no greater than construction, the submitted documents do not provide robust justification in support of this assumption. We would expect to see further information as to the decommissioning in the ES.	No	Further details on decommissioning are provided in **ES Chapter 4 Project Description** (document reference 6.1.4) and **Section 28.6.4** of **ES Chapter 28 Health** (document reference 6.1.28).
Public Health England (now OHID)	Human Health and Wellbeing	No	These themes have been taken into consideration in in **Section**

	This section of PHE's response, identifies the wider determinants of health and wellbeing we expect the ES to address, to demonstrate whether they are likely to give rise to significant effects. PHE has focused its approach on scoping determinants of health and wellbeing under four themes, which have been derived from an analysis of the wider determinants of health mentioned in the National Policy Statements. The four themes are: • Access • Traffic and Transport • Socioeconomic • Land Use Having considered the submitted scoping report PHE wish to make the following specific comments and recommendations: <u>Methodology</u> <u>In combination & cumulative effects reporting</u>		**28.6** of **ES Chapter 28 Health** (document reference 6.1.28).

	The local community will experience impacts from a range of factors due to this and other local developments over an extended period. The range of impacts over such a long period may result in minor effects gaining increased significance to local communities and the vulnerable population within. The PEIR notes the number of ongoing NSIP schemes within this area, including other offshore energy generating schemes and the Sizewell C development. In relation to cumulative impact these schemes will have particular importance to the assessment of construction staff accommodation needs, traffic and transport and the impact on the local health care system and community cohesion from the introduction of a large external workforce across a number of infrastructure schemes. These potential impacts have been acknowledged within the PEIR but have not been adequately assessed and considered not significant partly on the basis that any impact or effects are temporary. Chapter 29 identifies 670 non home-based workers and makes a worst-case assumption that half of these workers will require local accommodation. There is no justification for this assumption. The cumulative effects assessment within Chapter 29 does recognise impacts on accommodation but does not assess or use published assessments of accommodation availability (baseline and projected) to determine likely effects. The PEIR		

	also notes the impact of increased in-migration on demographic change during construction is temporary, short-term and reversible in nature. Although temporary the construction period may extend to 24 months, with vulnerable populations being at risk of reduced access to affordable low-cost accommodation. Recommendation The final ES should provide greater justification for the number for non-home-based workers and the impact on availability of affordable short-term accommodation and the cumulative effects for the study area. Local knowledge on the potential impact from non-home-based workers should be he local authority, public health and CCG/ICS teams. Should the applicant wish to scope out any of these recommendations from the ES, the applicant must provide adequate justification.		
NFU	13. ELECTRO MAGNETIC FIELDS There is considerable concern over EMF and the impact on health. The NFU would like to discuss this further with Equinor to understand what mitigation measures they are considering and what if any they believe magnetic fields may be greater at crossing points with the other underground cable schemes being developed by Vattenfall and Ørsted. Greater detail is also	No	The assessment of EMFs is presented in **ES Appendix 28.1 Sheringham and Dudgeon Extension Projects EMF Assessment** (document reference 6.3.28.1) of **ES**

	required on potential interference on Soil Sense Technology, RTK and other agricultural software.		**Chapter 28 Health** (document reference 6.1.28). The other underground cable schemes being developed by Vattenfall (Norfolk Vanguard and Norfolk Boreas) and Ørsted (Hornsea Project Three) are Direct Current (DC) cables and do not contribute to the EMFs associated with the Alternating Current (AC) undergrounds cables proposed under SEP and DEP. Therefore, any underground cable crossing points will not result in EMF increase. In addition, the EMFs associated with SEP and DEP underground onshore cables are significantly lower than government guidelines.
North Norfolk District Council (NNDC)	Chapter 30 – Health The contents of this chapter are noted. NNDC does not have any specific comments to make here.	No	Noted.

Reepham Town Council	At its meeting on May 5th, Reepham Town Council considered the Statutory Consultation in Respect of the Proposed Development. Councillors were fully supportive of the development of green energy but had major concerns and some serious questions about this proposal. A major concern is the impact on the countryside of the proposed cable route, which would be additional to those proposed by other similar projects, one of which is currently the subject of a judicial review. There were also major concerns about the large quantities of fossil fuels which would be burnt in the construction process and the impact of large numbers of journeys by heavy lorries on local roads in the Reepham area. It is also understood that the cables produce a significant magnetic field and will cross over other similar cables that are being proposed. This could have implications for people's health and safety.	No	The assessment of EMFs is presented in **ES Appendix 28.1 Sheringham and Dudgeon Extension Projects EMF Assessment** (document reference 6.3.28.1) and summarised in **Section 28.5.9** and **Section 28.6.4.2** of **ES Chapter 28 Health** (document reference 6.1.28). The EMF levels associated with SEP and DEP would be significantly below the relevant exposure limits, therefore no significant EMF effects arise as a result of SEP and DEP. For most designs evaluated, the magnetic fields reduce to a background level at the DCO order limits.
Barford and Wramplingham Parish Council	Equinor has NOT provided an objective assessment of mental and physical health risks posed to individuals and the population by its activities. Equinor has provided 106 pages of selective narrative that minimises any potential impacts, makes no mention of the precautionary principle, and justifies all its activities. Who wrote it, and what are their qualifications?	No	The Health Impact Assessment (HIA) methodology and finsings are set out in **ES Chapter 28 Health** (document reference 6.1.28). The precautionary principle generally applies where there

			are threats of serious damage to the environment or to health, and a lack of full scientific certainty. It provides decision makers with a framework for considering consenting risks and for application of damage minimisation where such scientific uncertainty may exist. In this case the impact assessment does not identify serious threats to health and scientific literature provides adequate understanding of the relevant determinants of health. The impact assessment is based on the consideration of a conservative approach to aspects of SEP and DEP. The precautionary principle has therefore been appropriately applied.