



# Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects

Response to ExA Request for a table of the anticipated  
adverse effects for each proposed scenario

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## Memo

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Subject Response to ExA Request for a table of the anticipated adverse effects for each proposed scenario

The Rule 6 letter (Annex F paragraph 10) requests “A table separately depicting the anticipated adverse effects for each proposed scenario corresponding to the individual receiving environments assessed in the Environmental Statement (ES) [APP-089, APP-092 to APP-115].”.

Advice Note Nine (PINS 2018) explains the use of the ‘Rochdale Envelope’ approach under the Planning Act 2008 as it applies to the Environmental Impact Assessment (EIA) process set out in The Infrastructure Planning (EIA) Regulations 2017 (the EIA Regulations). This includes that “the DCO must not permit the Proposed Development to extend beyond the ‘clearly defined parameters’ which have been requested and assessed” and “The parameters used for the assessment need to be clearly defined in the DCO and therefore in the accompanying [Environmental Statement] ES. This will simplify the assessment and give confidence that the Proposed Development within the DCO (as built) would not result in significant effects beyond those assessed in the ES.”. The Applicant observes that a key benefit of the Rochdale Envelope approach is that by identifying and assessing those parameters likely to result in the maximum adverse effect (the worst case scenario) negates the need to assess an unhelpful number of different scenarios that would result in lesser effects. This is consistent with Advice Note Nine (PINS 2018), which states that “Applicants should take care to ensure that the approach taken in the assessment is not overly complex, as this may impede the understanding of the assessment and the finding of likely significant effects.”.

The Scenarios Statement (APP-314) sets out the development scenarios and design options, and how these have been considered in the environmental assessment process (based on the information provided in ES Chapter 4 Project Description (APP-090)), ensuring the realistic worst case for each topic has been assessed. It explains that the EIA considers the appropriate realistic worst-case associated with the different development scenarios and design options, and presents the results accordingly.

The Applicant’s approach in this respect, including its consenting strategy, need for different development scenarios, the regulatory context, precedent for combined or linked NSIP applications and implications for DCO drafting were discussed with PINS pre-application. This followed the Applicant’s 31st March 2022 submission of certain draft application documents to PINS for review,

including ES Chapter 5 EIA Methodology (APP-091), on which section 51 advice was received on 27 May 2022 (PINS 2022) prior to the follow up meeting held on 15 June 2022 (PINS 2022). It was emphasised by the Applicant in this meeting that the key elements of its approach in this regard had been done multiple times before in other DCOs and that in this case, the Applicant is simply creating a clearer presentation of the different development scenarios (and associated EIA assessments) and more structured drafting in the Draft DCO (dDCO).

The information provided to define the realistic worst case is specific to the offshore and onshore topics of the ES. This is because for offshore topics the worst case is required to capture differences between SEP and DEP (namely that the wind farm arrays are in different locations and are different in size). Where both SEP and DEP are developed the differences are primarily driven by whether there will be one or two offshore substation platform/s (OSP). For example, in relation to temporary habitat loss / disturbance, Table 8-2 of ES Chapter 8 Benthic Ecology (APP-094) identifies the maximum area disturbed for each of SEP and DEP in isolation (scenario 1(a) or 1(b) in the dDCO (AS-009)), as well as where both SEP and DEP are developed, either with two OSPs (scenarios 1(c), 1(d), 2 or 3 in the dDCO (AS-009)) or one OSP (scenario 4 in the dDCO (AS-009)). The worst-case parameter for each activity / footprint where both SEP and DEP are developed is denoted with an asterisk and underlined. Cells are shaded grey to indicate the worst-case in relation to each of the impacts assessed. In addition, footnotes to the table are used to ensure that the rationale for the selection of the worst case is clear. In the example below, footnote 1 explains that where a scenario includes the design option to build out both the DEP North and DEP South array areas that is the worst-case for infield cable disturbance and footnote 2 explains that while a situation where only the DEP North array area is built out would require a greater length of interlink cables (154km compared to 143km), overall, the worst-case area subject to temporary habitat loss / disturbance would be in the instance that both the DEP North and DEP South array areas are built out.



Table 8-2: Realistic Worst-Case Scenarios

Impact	DEP in Isolation	SEP in Isolation	SEP and DEP		Notes and Rationale
			Two OSPs (one in SEP wind farm site and one in DEP North array area)	One OSP (located in SEP wind farm site)	
<b>Construction</b>					
Impact 1: Temporary habitat loss / physical disturbance	<p><b>Offshore cables:</b> Up to <b>263km</b>:</p> <ul style="list-style-type: none"> <li>One HVAC export cable up to <b>62km</b> in length</li> <li><b>135km</b> of infield cables (DEP North array area: 90km; DEP South array area: 45km)</li> <li>Up to 3 parallel interlink cables between DEP South array area and OSP in DEP North array area: up to <b>66km</b> in length (combined)</li> <li>Burial depth: 0.5 to 1.5m (excluding burial in sand waves up to 20m; and up to 1.0m for the export cables.</li> <li>Cable installation maximum width of disturbance: 15m</li> </ul> <p>Maximum area disturbed: <b>3.95km<sup>2</sup></b> (Export cable 0.93km<sup>2</sup>, Infield cables 2.025km<sup>2</sup>, Interlink cables 0.99km<sup>2</sup>)</p>	<p><b>Offshore cables:</b> Up to <b>130km</b>:</p> <ul style="list-style-type: none"> <li>One HVAC export cable up to <b>40km</b> in length</li> <li><b>90km</b> of infield cables</li> <li>No interlink cables</li> <li>Burial depth: Same as DEP in isolation</li> <li>Cable installation maximum width of disturbance: Same as DEP in isolation</li> </ul> <p>Maximum area disturbed: <b>1.95km<sup>2</sup></b> (Export cable 0.60km<sup>2</sup>, Infield cables 1.35km<sup>2</sup>)</p>	<p><b>Offshore cables:</b> Up to 393km:</p> <ul style="list-style-type: none"> <li>2 HVAC export cables up to <b>102km</b> in length</li> <li>Up to <b>225km</b> of infield cables (DEP North array area: 90km; DEP South array area 45km; SEP 90km)</li> <li>Up to 3 interlink cables from DEP South array area to the OSP in DEP North array area <b>66km</b> total length</li> <li>Burial depth: Same as SEP or DEP in isolation</li> <li>Cable installation maximum width of disturbance: Same as SEP or DEP in isolation</li> </ul> <p>Maximum area disturbed: <b>5.90km<sup>2</sup></b> (Export cable: 1.53km<sup>2</sup>, infield 3.38km<sup>2</sup>, interlink cables 0.99km<sup>2</sup>)</p>	<p><b>Offshore cables:</b> Up to <b>448km</b>:</p> <ul style="list-style-type: none"> <li>2 HVAC export cables from SEP up to <b>80km</b> in length</li> <li>Up to <b>225km</b> of infield cables (DEP North array area: 90km; DEP South array area 45km<sup>1</sup>; SEP 90km)</li> <li>Up to 7 interlink cables from DEP North array area (up to 5) and DEP South array area (up to 3) to OSP in SEP, up to <b>143km<sup>2</sup></b> total length<sup>2</sup></li> <li>Burial depth: Same as SEP or DEP in isolation</li> <li>Cable installation maximum width of disturbance: Same as SEP or DEP in isolation</li> </ul> <p>Maximum area disturbed: <b>6.72km<sup>2*</sup></b> (Export cable: 1.20km<sup>2</sup>, infield 3.37km<sup>2</sup>, interlink cables 2.15km<sup>2</sup>)</p>	<p>The temporary disturbance relates to sea bed preparation and cable installation and is based on a 15m maximum cable installation disturbance width.</p>
	<p><b>Sea bed preparation</b></p> <ul style="list-style-type: none"> <li>Sand wave clearance: <b>0.93km<sup>2</sup></b></li> <li>Worst-case is for GBS foundations: <b>0.073km<sup>2</sup></b> (for up to 24 18MW wind turbines)</li> <li>Route clearance:</li> <li>Pre-lay grapnel run (PLGR): included in cable installation width area</li> </ul>	<p><b>Sea bed preparation</b></p> <ul style="list-style-type: none"> <li>Sand wave clearance: <b>0km<sup>2</sup></b></li> <li>Worst-case is for GBS foundations: <b>0.057km<sup>2</sup></b> (for up to 19 18MW wind turbines)</li> <li>Route clearance:</li> <li>PLGR: included in cable installation width area</li> </ul>	<p><b>Sea bed preparation</b></p> <ul style="list-style-type: none"> <li>Sand wave clearance: <b>0.93km<sup>2*</sup></b></li> <li>Worst-case is for GBS foundations: <b>0.13km<sup>2</sup></b> (for up to 43 18MW wind turbines)</li> <li>Route clearance:</li> <li>PLGR: included in cable installation width area.</li> </ul>	<p><b>Sea bed preparation</b></p> <ul style="list-style-type: none"> <li>Sand wave clearance<sup>3</sup>: <b>0.76km<sup>2</sup></b></li> <li>Worst-case is for GBS foundations: <b>0.13km<sup>2</sup></b> (for up to 43 18MW wind turbines)</li> <li>Route clearance:</li> <li>PLGR: included in cable installation width area</li> </ul>	<p>The maximum area of sea bed preparation disturbance from a single 18MW GBS foundation = 3,019m<sup>2</sup>. Sea bed preparation disturbance from a 15MW GBS foundation = 1,735m<sup>2</sup> and therefore despite there being a higher number of 15MW foundations (30 for DEP and 23 for SEP) the worst-case is associated with the 18MW GBS foundation of which there could be up to 24 for DEP and 19 for SEP.</p>

<sup>1</sup> Build out of DEP North and South array areas is worst-case scenario for infield cable disturbance

<sup>2</sup> While a scenario where only the DEP North array area is built out would require a greater length of interlink cables (154km compared to 143km), overall, the worst-case area subject to temporary habitat loss / disturbance would be a scenario where both DEP North and South array areas are built out

<sup>3</sup> Greater area of sand wave clearance required for a one OSP scenario where both the DEP North and South array areas are developed compared to when only the DEP North array area is developed (0.76km<sup>2</sup> versus 0.64km<sup>2</sup>) means the former is the worst-case.

For onshore topics, given the shared nature of the cable corridor and substation, the worst case is primarily driven by whether the two projects are developed concurrently or sequentially and therefore the worst-case scenarios are presented in this context e.g. Table 17-2 of ES Chapter 17 Ground Conditions and Contamination (APP-103):



Table 17-2: Realistic Worst-Case Scenarios

Impact	SEP or DEP in Isolation	SEP and DEP Concurrently	SEP and DEP Sequentially	Notes and Rationale
<b>Construction</b>				
<p><b>Impact 1:</b> Exposure of Work Force, Land Owners, Land Users and Neighbouring Land Users to Contaminated Soils and Groundwater and Associated to Health Impacts.</p>	<p><b>Landfall:</b></p> <ul style="list-style-type: none"> <li>HDD drills: Number: 2, Length: 1,150m</li> <li>Transition joint bays: Number: 1, Dimensions: 26m (L) x 10m (W) x 3m (D)</li> <li>HDD compound area: 75m x 75m</li> <li>Total works area: 48,955m<sup>2</sup></li> <li>Approximate quantity of excavated material: Total: 3,250m<sup>3</sup></li> <li>Duration: Landfall HDD: 4 months, Landfall cable pull: 2 months</li> </ul>	<p><b>Landfall:</b></p> <ul style="list-style-type: none"> <li>HDD drills: Number: 4, Length: 1,150m</li> <li>Transition joint bays: Number: 2, Dimensions: 26m (L) x 12m (W) x 3m (D) per transition joint bay</li> <li>HDD compound area: 75m x 75m</li> <li>Total works area: 48,955m<sup>2</sup></li> <li>Approximate quantity of excavated material: Total: 3,450m<sup>3</sup></li> <li>Duration: Landfall HDD: 5 months, Landfall cable pull: 4 months</li> </ul>	<p><b>Landfall:</b></p> <ul style="list-style-type: none"> <li>HDD drills: Number: 4, Length: 1,150m</li> <li>Transition joint bays: Number: 2 (adjacent to each other), Dimensions: 26m (L) x 10m (W) x 3m (D) per transition joint bay</li> <li>HDD compound area: 75m x 75m (per project and overlapping)</li> <li>Total works area: 48,955m<sup>2</sup></li> <li>Approximate quantity of excavated material: Total: 6,500m<sup>3</sup></li> <li>Duration: Landfall HDD: 4 months, Landfall cable pull: 2 months (per project)</li> </ul>	<p>These parameters represent the maximum footprint of disturbance within the DCO order limits, in which the potential disturbance of existing contamination could occur.</p> <p>SEP and DEP are considered as the worst-case scenario when compared to SEP or DEP in isolation due to the requirement for two trenches. The creation of the onshore cable corridor has the potential to create a preferential pathway which could expose human health receptors to ground gas / vapours.</p>

As a result the Applicant considers that the information that it has provided in its application appropriately identifies and assesses the likely significant effects of the proposed development accounting for the possible development scenarios and design options that would be permitted by the dDCO. The Applicant has given careful consideration to the identification of the worst case in this regard and how this has been demonstrated throughout the assessments, and has consulted extensively with stakeholders on this basis pre-application. Further information depicting the anticipated adverse effects for any other scenario that by definition would result in lesser effects would involve a significant amount of additional assessment work and provide information which goes beyond that required by the EIA Regulations. The Applicant therefore cannot provide this at this stage, and is extremely reluctant to do so given the points made in this response.

### **References**

PINS 2018. Advice Note Nine: Rochdale Envelope. Republished July 2018 (version 3).

PINS 2022. Meeting note dated 15 June 2022 (including 27 May 2022 section 51 advice). Project update meeting. File reference EN010109.