

# Hornsea Offshore Wind Farm

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Project Two

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## Appendix referred to in response to EL9 – Most/Least Disruptive Scenarios Table

**Appendix R to the Response submitted for Deadline I**

**Application Reference: EN010053**

15 July 2015

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**Appendix R: Appendix referred to in Response to EL9 – Most/Least Disruptive Scenarios Table**

There are a number of potential scenarios for the timing of construction of Project Two and Project One. This has been taken into account in the onshore cumulative impact assessment of Project Two with Project One. This has been assessed on the basis of the following three potential scenarios:

- Scenario One - Project One constructed before Project Two.
- Scenario Two - Project Two constructed before Project One.
- Scenario Three - Project One and Project Two constructed at the same time.

The potential cumulative effects of Project Two with Project One for ecology and nature conservation are summarised below.

| <b>Potential Cumulative Effects of Project Two with Project One on Ecology and Nature Conservation.</b>                    |   |  |   |  |
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| <b>Causes of Impact</b>  | <b>Most disruptive scenario - species</b>   | <b>Least disruptive scenario - species</b>   | <b>Most disruptive scenario - habitats</b>  | <b>Least disruptive scenario - habitats</b>  |
| Export cables installation at the landfall by trenchless method and cable pulling (including access tracks and compounds). | <p><u>Intertidal birds duration:</u></p> <p><b>The scenario over which disturbance may occur over the longest duration are Scenarios One and Two</b> (see Intertidal Ornithology Chapter 4 Volume 3 of the ES; Doc Ref 7.3.4). Under these scenarios successive construction of each project in the intertidal will result in an extended period of small scale disturbance in the vicinity of the cable landfall area, but this is not considered to be of any more than minor significance.</p> | <p><u>Intertidal birds duration:</u></p> <p><b>The scenario over which disturbance may occur for the shortest duration is Scenario Three</b> (see Intertidal Ornithology Chapter 4 Volume 3 of the ES; Doc Ref 7.3.4). Under this scenario construction activities for both projects would occur simultaneously with a duration no longer than Project One or Two being constructed alone.</p> | <p><u>Sand dunes/coastal lagoons:</u></p> <p><b>The most disruptive scenarios, with regard to the duration of habitat disturbance and damage, would be Scenario One or Two.</b> By constructing projects at different times, the duration of habitat disturbance and damage and delay until habitat reinstatement could be undertaken would be greater. However, this is not considered to be of any more than minor significance due to the limited width and location of access routes.</p>                       | <p><u>Sand dunes/coastal lagoons:</u></p> <p><b>The least disruptive scenario, with regard to the duration of habitat disturbance and damage, would be Scenario Three.</b> By constructing projects at the same time, the period of construction would be reduced and habitat reinstatement would be undertaken sooner.</p>  |
|  | <p><u>Intertidal birds spatial :</u></p> <p><u>The scenario over which disturbance may occur over the greatest spatial area is Scenario Three</u> (see Intertidal Ornithology Chapter 4 Volume 3 of the ES; Doc Ref 7.3.4). Under this scenario construction for both projects would occur simultaneously.</p> <p>Simultaneous work on Project One and Project Two would result in an increased spatial extent and frequency of disturbance between April and September. Disturbance to the</p>   | <p><u>Intertidal birds spatial :</u></p> <p><u>The scenarios over which disturbance will occur over the smallest spatial areas is Scenarios One and Two.</u> Under this scenario the spatial extent of disturbance will be no greater than from either project alone.</p>  | <p><u>Intertidal sand flats, including saltmarsh:</u></p> <p><b>The most disruptive scenario, with regard to habitat disturbance and damage, could be Scenario Three.</b> By constructing projects at the same time, the extent of habitat disturbance and damage would be greater than if projects were constructed at separate times. This would reduce the area of undisturbed muds/sands with associated plants and seed bank and reduce the ability to monitor the effectiveness of mitigation with regard</p> | <p><u>Intertidal sand flats, including saltmarsh:</u></p> <p><b>The least disruptive scenario, with regard to habitat disturbance and damage, could be Scenarios One or Two.</b> By constructing projects at different times, the impact area will be reduced at any one time and it will be possible to monitor the effectiveness of habitat reinstatement after each Phase of cable installation in order to inform restoration of habitat for the second project.</p> |

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|   | intertidal area would be intermittent rather than continuous, with periods of no or minimal disturbance between periods of construction activity.   |  | to habitat reinstatement at the end of each Phase of cable installation.  |  |
| Trenchless duct installation and cable pulling elsewhere along the cable route (including access tracks and compounds).   | <p><u>Protected species:</u></p> <p><b>The most disruptive scenario, with regard to species displacement, would be Scenario Two.</b> Species displacement would occur due to species and habitat disturbance as well as habitat loss. Taking into account the proximity of the projects, displacement impact zones would overlap considerably and by constructing projects at different times, the duration of the displacement impact within these partially overlapping zones would be prolonged. In some cases the presence of the Project Two cables will preclude the use of some of Project One compounds and additional compounds are included in the Project Two DCO for use by Project One. These are identified as Compensation Compounds on the plans at Annex 4.5.4 of Volume 4 of the ES. This will result in some additional habitat loss and therefore, potential species disturbance and displacement. However, this is not considered to be of any more than minor significance due to the location of compounds, i.e. in open areas set at appropriate distances from ecologically sensitive features (Sections 4.2 and 4.3 of the OEMP).</p> | <p><u>Protected species:</u></p> <p><b>The least disruptive scenario, with regard to species displacement, would be Scenario Three.</b> By constructing projects together the period of displacement would be less than if projects were constructed separately and, therefore, fewer breeding seasons would be impacted upon and it would be possible to commencement habitat replacement/reinstatement sooner.</p> | <p><u>Habitats:</u></p> <p><b>The most disruptive scenario, with regard to habitat disturbance and damage, would be Scenario Two.</b> Although the impact of construction on habitats, in particular watercourses where trenchless installation would be undertaken, by constructing the projects separately the period of potential impact from pollutants would be greater than if projects were constructed at the same time. In some areas, the presence of Project Two cables would require additional works compounds to be constructed for Project One. These are identified as Compensation Compounds on the plans at Annex 4.5.4 of Volume 4 of the ES. However, this is not considered to be of any more than minor significance due to the location of compounds, i.e. in open areas set at appropriate distances from ecologically sensitive features (Sections 4.2 and 4.3 of the OEMP).</p> | <p><u>Habitats:</u></p> <p><b>The least disruptive scenario, with regard to habitat disturbance and damage, would be Scenario Three.</b> Although the impact of construction on habitats, in particular watercourses, would be minimal due to the commitment to trenchless installation, by constructing the projects together the period of potential impact from pollutants would be reduced and habitat replacement/reinstatement could be undertaken sooner.</p> |
| Open-cut trenching and cable installation or duct installation and cable pulling (including access tracks and compounds). | <p><u>Protected species:</u></p> <p><b>The most disruptive scenario, with regard to species displacement, would be Scenario Two.</b> Species displacement would occur due to species and habitat disturbance as well as habitat loss. Taking into account the proximity of the projects, displacement impact zones would</p>  | <p><u>Protected species:</u></p> <p><b>The least disruptive scenario, with regard to species displacement, would be Scenario Three.</b> By constructing projects together the period of displacement would be less than if projects were constructed separately and, therefore, fewer breeding seasons would be impacted</p>   | <p><u>Woodland and mature broadleaved trees/hedgerows and hedgerow trees:</u></p> <p><b>The most disruptive scenario, with regard to habitat loss and disturbance, would be Scenario Three</b> as this would result in a greater area of habitat clearance prior to the commencement of any replacement planting/habitat</p>  | <p><u>Woodland and mature broadleaved trees/hedgerows and hedgerow trees:</u></p> <p><b>The least disruptive scenario, with regard to habitat loss and disturbance, would be Scenario One.</b> Project One requires less tree/hedgerow clearance than Project Two (adjacent to the HVDC converter/HVAC substation site). Scenario Two and Three would require</p>  |

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|  | <p>overlap considerably and by constructing projects at different times, the duration of the displacement impact within these partially overlapping zones would be prolonged. In some areas, the presence of Project Two cables would require additional compounds to be constructed for Project One (Annex 4.5.4 of Volume 4 of the ES). This would result in additional habitat loss and species disturbance. However, this is not considered to be of any more than minor significance due to the location of compounds, i.e. in open areas set at appropriate distances from ecologically sensitive features (Sections 4.2 and 4.3 of the OEMP).</p> | <p>upon and it would be possible to commence habitat replacement/reinstatement sooner.</p>  | <p>reinstatement than Scenarios One or Two. However, replacement planting would be undertaken sooner and the period of disturbance would be reduced than under the other scenarios. Therefore, this is not considered to be of any more than minor significance than other scenarios.</p>  | <p>additional access or works compounds and therefore, potential habitat disturbance. If Project One is undertaken first, replacement planting along the cable route could be completed prior to the clearance of a greater amount of trees/hedgerows for Project Two.</p>   |
|  |  |   | <p><u>Watercourses/ponds:</u></p> <p><b>The most disruptive scenario, with regard to habitat loss and disturbance, would be Scenario Two.</b> In some areas the, the presence of Project Two cables would preclude the use of some of Project One compounds and additional compounds would be required to be constructed for Project One (Annex 4.5.4 of Volume 4 of the ES), resulting in greater habitat disturbance. Taking into account the proximity of/overlap of some parts of the working areas, the duration of habitat disturbance would be greatest. However, taking into account measures to protect water environment described in Paragraphs 4.2.24 – 4.2.39 of the Outline Code of Construction Practice (OCoCP) (Doc ref No 12.4), this is not considered to be of any more than minor significance.</p> | <p><u>Watercourses/ponds:</u></p> <p><b>The least disruptive scenario, with regard to habitat loss and disturbance, could be Scenario Three</b> as this would result in the shortest period of disturbance before habitat could be reinstated.</p>   |
| <p>Construction of the onshore HVDC converter/HVAC substation (including access tracks and compounds).</p> | <p><u>Protected species:</u><br/><b>The most disruptive scenario would be Scenario One.</b> By undertaking the works separately, the duration of disturbance would be greater, affecting a greater number of breeding seasons. Species most likely to be affected by the longer works period will be breeding birds, bats and badgers. However, taking into account the availability of alternative favourable habitat in the surrounding area and the relatively low levels of species activity recorded in the area, the</p>   | <p><u>Protected species:</u><br/><b>The least disruptive scenario would be Scenario Three</b> as this would ensure the shortest potential duration of displacement/disturbance. Taking into account the proximity of the work areas for Project One and Project Two, it is considered that the disturbance impact zone of each project would overlap considerably and, therefore, the disturbance impact zone of the two projects combined would not be considerably different to that of any one project considered independently. Therefore, although by constructing Project Two first, some</p> | <p><u>Woodland and mature broadleaved trees/hedgerows and hedgerow trees:</u><br/><b>The most disruptive scenario, with regard to habitat loss and disturbance, would be Scenario One.</b> Scenario One would result in the greatest duration of habitat loss.</p>   | <p><u>Woodland and mature broadleaved trees/hedgerows and hedgerow trees:</u><br/><b>The least disruptive scenario, with regard to habitat loss, would be Scenario Two</b> as this requires less tree/hedgerow clearance than Scenario Three and a greater amount of replacement and enhancement planting could be undertaken prior to the completion of Project One construction than could be undertaken prior to the completion of Project Two construction, if Project One was constructed first. <b>However, the duration of habitat disturbance would be least under Scenario Three.</b></p> |

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|  | absence of badger setts and bat roosts, the impact will be limited and of no more than minor significance. | replacement planting could be undertaken prior to the commencement of Project One, the duration of construction disturbance would be greater than if projects were constructed at the same time. |   |  |
|  |  |  | <p><u>Watercourses:</u><br/> <b>The most disruptive scenario, with regard to habitat loss and disturbance, would be Scenario One</b> as these options would increase the duration of habitat disturbance and potential impact of pollutants. Although Scenario Two would result in a similar duration of potential habitat disturbance, replacement planting could be delayed for a longer period in some areas than under Scenario Two, which could present a greater duration of impact risk from potential run-off pollutants. However, taking into account measures to protect water environment described in Paragraphs 4.2.22-4.2.39, of the Outline Code of Construction Practice (OCoCP) (Doc ref No 12.4), this is not considered to be of any more than minor significance.</p> | <p><u>Watercourses:</u><br/> <b>The least disruptive scenario, with regard to habitat loss and disturbance, would be Scenario Three</b> as this would result in a reduced period of disturbance and therefore, reduced period of potential impact from pollutants.</p> |