



Triton Knoll Offshore Wind Farm Limited Triton Knoll Electrical System

**Appendix 8: Response to
Submission from Mr and Mrs Fox
at Deadline 3**

Date: 5th January 2016

**Appendix 8 of the Applicant's
Response to Deadline 4**

Triton Knoll Offshore Wind Farm Limited

Triton Knoll Electrical System

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1. MR AND MRS FOX

1.1 The representation submitted by Mr and Mrs Fox for Deadline 3 raises a number of specific issues and concerns regarding the potential impacts arising from the proposed development, in summary these are:

- a) Increased water table level; and
- b) Electromagnetic fields.

Increased Water Table Level

1.2 The representation comments on the potential for the water table to rise causing problems for septic tanks and ingesters. There is no detail about the location of the Fox's property so this response explains the approach that has been taken to flood risk for all elements of the proposed development.

1.3 The Applicant refers the ExA to paragraphs 1.6 – 1.7 of Appendix 7: *Written Representation Response to Mrs Helen Bowler* of the Applicant's response to Deadline 2 which explains how the Applicant has considered flood risk within the application and highlights that Requirement 10 of the draft DCO (Document Reference 3.1) requires a surface water drainage scheme to be submitted and approved by the lead local flood authority, the drainage boards and the relevant planning authority.

1.4 The Applicant has undertaken a Flood Risk Assessment (FRA) presented in Volume 5, Annex 7.3 of the ES (document reference 6.2.5.7.3); the EA were consulted throughout the development of the FRA and advised the Applicant that it should be based on the standard, published flood zones 2 and 3. This is what has been used for the FRA (see Figure 4.2 of Volume 5, Annex 7.3 Flood Risk Assessment of the ES (document reference 6.2.5.7.3)).

1.5 Paragraph 5.4.2 of the FRA states that the assessment "*demonstrates that the project will be safe and that it will **not increase flood risk elsewhere***" [emphasis added]. This assertion can be made because:

- Critical electrical components of the development at the Intermediate Electrical Compound (IEC) and Substation will be raised above the 0.1% plus climate change flood level.
- The electrical cables will be buried.

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- The floodplain storage volume taken by the development is negligible compared to the large extent of the floodplain and will therefore not increase flood levels or extents.
 - Runoff from impermeable areas at the IEC and substation sites will be attenuated within the voids of the gravel dressing the surface of the site.
- 1.6 The Flood Risk Assessment (FRA) includes a surface water drainage strategy which outlines the principles which the final scheme must accord with. The surface water drainage scheme will minimise risk of flooding.
- 1.7 Section 4.5 of the FRA acknowledges that groundwater flooding can occur when the water table rises above the ground level and flows or ponds on the ground surface. It states that *"long term high rainfall totals are the primary cause of high groundwater levels, which means groundwater flooding is more likely during the winter months when rainfall is greatest."*
- 1.8 The Applicant sought detailed information in relation to groundwater flooding from the EA and the Lead Local Flood Authority (LLFA) (in this case Lincolnshire County Council) at the time of developing the FRA. The only available information source was the EA's groundwater vulnerability map, which indicates vulnerability to pollution hazard and, in some areas, can also be indicative of vulnerability to groundwater flooding. A review of the groundwater vulnerability map indicated that groundwater vulnerability is 'Major High' and 'Minor High' to the north east of the cable route along the coastline due to the presence of the principal Chalk aquifer. However, since there is a thick layer (approximately 30 metres) of unproductive clay deposits overlying the bedrock chalk aquifer in this area, groundwater flooding is unlikely.
- 1.9 With regard to climate change as set out in Volume 5, Annex 7.3 of the ES the project has assessed the potential impacts using the Environment Agency mapping and estimated flood levels for the 0.1% (1 in 1000) annual probability event for the 2115 climate change scenario.
- 1.10 Paragraph 7.1.3 of Volume 5, Annex 7.3 of the ES states that for the cable route;
- "During operation, there will be no impact on flood risk elsewhere as the system will be underground and will not influence flood levels or extent at the surface. All subsurface land drains that are removed during construction will be replaced."*
- 1.11 Paragraph 7.1.6 of Volume 5, Annex 7.3 of the ES states that for the IEC;
- "The Intermediate Electrical Compound site will not increase flood risk elsewhere as the floodplain storage volume taken by the development is negligible compared to the"*
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tidal flood volumes and large extent of the floodplain. Runoff from impermeable areas at the site will be attenuated within the voids of the gravel dressing the surface of the site.”

1.12 Paragraph 7.1.9 of Volume 5, Annex 7.3 of the ES states that for the substation;

“The development of the Substation will not increase flood risk elsewhere as the floodplain storage volume taken by the development is negligible compared to the large extent of the floodplain and will therefore not increase flood levels or extents. Runoff from impermeable areas at the site will be attenuated within the voids of the gravel dressing the surface of the site.”

1.13 Paragraph 7.1.12 of Volume 5, Annex 7.3 of the ES states that for the National Grid Substation;

“The new equipment to be installed at the National Grid Bicker Fen substation will not increase flood risk elsewhere as the floodplain storage volume taken by the development is negligible compared to the large extent of the floodplain and will therefore not increase flood levels or extents. Runoff from new impermeable areas at the site will drain freely to local drainage or drain to interceptors where there are water quality concerns.”

1.14 Paragraph 7.1.13 of Volume 5, Annex 7.3 of the ES states that for the development

“Flood risk from other potential sources of flooding to each part of the development are equal to or less than those outlined above from tidal and fluvial sources and are therefore mitigated through the measures put in place to address tidal and fluvial flooding.”

1.15 In addition the Applicant notes that the detailed FRA was agreed with the Environment Agency and other review panel stakeholders during the Evidence Plan process, as captured in the EIA Evidence Plan (document reference 8.16).

Electromagnetic Fields

1.16 The representation raises a concern regarding potential interference with medical equipment from electromagnetic field (EMF) generation and the possibility of increased cancer risk, particularly in children.

1.17 The Applicant takes its responsibility to the general public and to its own employees very seriously where our equipment may have an impact on health.

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- 1.18 The cable route has been designed to avoid crossing domestic dwelling land, and is kept within agricultural land. As a result the cable will not be in close proximity to dwellings as explained in the Applicant's response to **Eon 2.1** of the ExA's second written questions.
- 1.19 In respect of the strength of the field created, the Applicant confirms that at a distance of 1 m above the ground the EMF levels will be less than the international recognised ICNIRP limit for safe levels for both workers and general public of 200 μ T.
- 1.20 For purposes of determining the maximum current the 200 μ T limit is taken at 1 m above ground level. This equates to a single core carrying 2000 A, buried at 1 m deep; this is a simplification and presents a worst case scenario. The simplification does not take into account the benefits of the cancellation effect found in 3 phase systems; either flat formation or trefoil formation, where the magnitude will reduce from the simple worst case scenario as set in **E On 2.1** of the ExA's second written questions.
- 1.21 The currents in the TKES cables will be less than half this value, at 656 A, therefore the EMF level directly above the cables will be less than half the international guideline limits. It should also be noted that this value will diminish within a short distance as set out in the Applicant's response to **Eon 2.1** of the ExA's second written questions.
- 1.22 All medical equipment is designed such that EMFs do not cause the kind of issues described in the representation. The Applicant highlights that, for example, a medical facility has higher grade equipment that generates larger magnetic fields than those which will be generated by the cables; medical equipment that is taken into these facilities and is therefore exposed to such high grade EMF sources must operate normally in those circumstances and therefore there is no risk that the breathing equipment would not continue to operate normally in close proximity to the TKES cables.
- 1.23 The Applicant would also refer to Appendix 24 of the Applicant's response to Deadline 1, which includes a letter from Public Health England confirming that:
- "the documentation confirms that the EMF levels will comply with the recommended exposure guidelines. Public Health England (PHE) is now able to confirm that we have no further concerns regarding this aspect of the application."*