



White Cross Offshore Windfarm Environmental Statement

Chapter 25: Inter-relationships



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Glossary of Acronyms

Acronym	Definition
ALC	Agricultural Land Classification
CCRA	Climate Change Risk Assessment
EIA	Environmental Impact Assessment
ES	Environmental Statement
GHG	Greenhouse Gas
IPC	Infrastructure Planning Commission
LNR	Local Nature Reserve
LVIA	Landscape and Visual Impact Assessment
m	Metre
MLWS	Mean Low Water Springs
MW	Megawatts
NO_x	Nitrogen Oxides
NPS	National Policy Statement
NRMM	Non-Road Mobile Machinery
WCOWL	White Cross Offshore Windfarm Limited
PDE	Project Design Envelope
SAC	Special Area of Conservation
SSSI	Site of Special Scientific Interest
TCPA	Town and Country Planning Act

Glossary of Terminology

Defined Term	Description
Agreement for Lease	An Agreement for Lease (AFL) is a non-binding agreement between a landlord and prospective tenant to grant and/or to accept a lease in the future. The AFL only gives the option to investigate a site for potential development. There is no obligation on the developer to execute a lease if they do not wish to.
Applicant	White Cross Offshore Windfarm Limited
Cumulative effects	The effect of the Onshore Project taken together with similar effects from a number of different projects, on the same single receptor/resource. Cumulative Effects are those that result from changes caused by other past, present or reasonably foreseeable actions together with the Onshore Project.
Environmental Impact Assessment (EIA)	Assessment of the potential impact of the proposed Project on the physical, biological and human environment during construction, operation and decommissioning.
Export Cable Corridor	The area in which the export cables will be laid, either from the Offshore Substation or the inter-array cable junction box (if no offshore substation), to the NG Onshore Substation comprising both the Offshore Export Cable Corridor and Onshore Export Cable Corridor.
Landfall	Where the offshore export cables come ashore
Mitigation	<p>Mitigation measures have been proposed where the assessment identifies that an aspect of the development is likely to give rise to significant environmental impacts, and discussed with the relevant authorities and stakeholders in order to avoid, prevent or reduce impacts to acceptable levels.</p> <p>For the purposes of the EIA, two types of mitigation are defined:</p> <ul style="list-style-type: none"> • Embedded mitigation: consisting of mitigation measures that are identified and adopted as part of the evolution of the project design, and form part of the project design that is assessed in the EIA • Additional mitigation: consisting of mitigation measures that are identified during the EIA process specifically to reduce or eliminate any predicted significant effects. Additional mitigation is therefore subsequently adopted by WCOWL as the EIA process progresses.
National Grid Onshore Substation	Part of an electrical transmission and distribution system. Substations transform voltage from high to low, or the reverse by means of the electrical transformers.
Offshore Export Cable Corridor	The proposed offshore area in which the export cables will be laid, from Offshore Substation Platform or the inter-array cable junction box to the Landfall
the Offshore Project	The Offshore Project for the offshore Section 36 and Marine Licence application includes all elements offshore of MHWS. This includes the infrastructure within the windfarm site (e.g. wind turbine generators, substructures, mooring lines, seabed anchors, inter-array cables and Offshore Substation Platform (as applicable)) and all infrastructure associated with the export cable route and landfall (up to MHWS) including the cables and associated cable protection (if required).
Offshore Substation Platform	A fixed structure located within the Windfarm Site, containing electrical equipment to aggregate the power from the wind turbines and convert it into a more suitable form for export to shore

Defined Term	Description
Onshore Development Area	The onshore area above MLWS including the underground onshore export cables connecting to the White Cross Onshore Substation and onward to the NG grid connection point at East Yelland. The onshore development area will form part of a separate Planning application to the Local Planning Authority (LPA) under the Town and Country Planning Act 1990.
Onshore Export Cables	The cables which bring electricity from MLWS at the Landfall to the White Cross Onshore Substation and onward to the NG grid connection point at East Yelland.
Onshore Export Cable Corridor	The proposed onshore area in which the export cables will be laid, from MLWS at the Landfall to the White Cross Onshore Substation and onward to the NG grid connection point at East Yelland.
Onshore Infrastructure	The combined name for all infrastructure associated with the Project from MLWS at the Landfall to the NG grid connection point at East Yelland. The onshore infrastructure will form part of a separate Planning application to the Local Planning Authority (LPA) under the Town and Country Planning Act 1990
the Onshore Project	The Onshore Project for the onshore TCPA application includes all elements onshore of MLWS. This includes the infrastructure associated with the offshore export cable (from MLWS), landfall, onshore export cable and associated infrastructure and new onshore substation (if required).
White Cross Offshore Windfarm Ltd	White Cross Offshore Windfarm Ltd (WCOWL) is a joint venture between Cobra Instalaciones Servicios, S.A., and Flotation Energy Ltd
the Project	the Project is a proposed floating offshore windfarm called White Cross located in the Celtic Sea with a capacity of up to 100MW. It encompasses the project as a whole, i.e. all onshore and offshore infrastructure and activities associated with the Project.
Transition joint bay	Underground structures at the Landfall that house the joints between the offshore export cables and the onshore export cables
White Cross Offshore Windfarm	100MW capacity offshore windfarm including associated onshore and offshore infrastructure
White Cross Onshore Substation	A new substation built specifically for the White Cross project. It is required to ensure electrical power produced by the offshore windfarm is compliant with NG electrical requirements at the grid connection point at East Yelland.
Windfarm Site	The area within which the wind turbines, Offshore Substation Platform and inter-array cables will be present
Works completion date	Date at which construction works are deemed to be complete and the windfarm is handed to the operations team. In reality, this may take place over a period of time.

25. Inter-relationships

25.1 Introduction

1. This chapter of the Environmental Statement (ES) presents the inter-relationships identified during the Environmental Impact Assessment (EIA) process for the White Cross Offshore Windfarm Project (the Onshore Project). Specifically, this chapter considers the potential impact of the Onshore Project landward of Mean Low-Water Spring (MLWS) during its construction, operation and maintenance, and decommissioning phases.
2. This ES only considers inter-relationships for the Onshore Project above MLWS. Cumulative effects (including cumulative effects with the Offshore Project) are assessed within each technical chapter. Inter-relationships below Mean High Water Springs are considered in the separate Offshore Project ES.
3. The ES has been finalised with due consideration of pre-application consultation to date (see **Chapter 7: Consultation**) and the ES will accompany the planning permission application under the Town and Country Planning Act 1990 (TCPA 1990).
4. This chapter summarises the inter-relationships that have been identified on each receptor or receptor group by the technical chapters contained within this ES. These include:
 - **Chapter 8: Marine and Coastal Processes**
 - **Chapter 9: Marine Water and Sediment Quality**
 - **Chapter 10: Benthic and Intertidal Ecology**
 - **Chapter 11: Marine Mammal and Marine Turtle Ecology**
 - **Chapter 12: Ground Conditions and Contamination**
 - **Chapter 13: Air Quality**
 - **Chapter 14: Water Resources and Flood Risk**
 - **Chapter 15: Land Use**
 - **Chapter 16: Onshore Ecology and Ornithology**
 - **Chapter 17: Onshore Archaeology and Cultural Heritage**
 - **Chapter 18: Noise and Vibration**
 - **Chapter 19: Traffic and Transport**
 - **Chapter 20: Onshore Landscape and Visual Amenity**
 - **Chapter 21: Socio-Economics (including Tourism and Recreation)**
 - **Chapter 22: Human Health**
 - **Chapter 23: Climate Change**
 - **Chapter 24: Major Accidents and Disasters.**

5. Inter-relationships have been described taking into account all of the effects that have been identified upon specific receptors. Both beneficial and adverse effects have been considered in this process. Where appropriate to do so, a combined effect from all of the sources impacting a receptor has been identified.
6. When considering the potential for inter-relationships to occur, it is assumed that an impact determined as having No Change on a receptor will not result in an inter-relationship when combined with other impacts on the same receptor. However, where a series of negligible or greater impacts are identified, they are taken forward for further consideration.

25.2 Policy, Legislation and Guidance

7. **Chapter 3: Policy and Legislative Content** describes the wider policy and legislative context for the Onshore Project. The principal policy and legislation used to inform the assessment of potential inter-relationships for the Onshore Project are outlined in this section.

25.2.1 National Policy Statement

8. The specific assessment requirements for inter-relationships are set out within the overarching National Policy Statement (NPS) for Energy (EN-1) which is summarised in **Table 25.1**.
9. Although the Onshore Project is not an Nationally Significant Infrastructure Project, it is recognised that due to its size of up to 100MW, certain NPS are considered relevant to the Onshore Project.

Table 25.1 Summary of NPS EN-1 provisions relevant to Inter-relationships

Summary	How and where this is considered in the ES
<p>“The Infrastructure Planning Commission (IPC) (now the Planning Inspectorate) should consider how the accumulation of, and inter-relationship between, effects might affect the environment, economy or community as a whole, even though they may be acceptable when considered on an individual basis with mitigation measures in place.” - EN-1 paragraph 4.2.6</p>	<p>This is considered throughout Section 25.3.</p>

25.2.2 Other relevant guidance

10. The Onshore Project is based on a project design envelope (or 'Rochdale Envelope') approach. The advice note nine 'Rochdale Envelope' approach has been employed under the Planning Act 2008. It is recognised by consenting authorities that, at the time of submitting an application, offshore wind developers may not know the precise nature and arrangement of infrastructure and associated infrastructure that make up the proposed development.
11. The general principle of the assessment, under the Project Design Envelope (PDE), or 'Rochdale Envelope' approach, is that for each receptor the impact assessment will be based on assessing project design parameters likely to result in the maximum adverse effect, or least beneficial effect, (i.e. the worst-case scenario) for each potential impact. The PDE outlines the realistic worst-case scenario for each individual impact, so that it can be safely assumed that all lesser options will have less impact.
12. Using the PDE approach means that receptor-specific potential impacts draw on the options from within the wider envelope that represent the most realistic worst-case-scenario. It is also worth noting that under this approach the combination of project options constituting the realistic worst-case scenario may differ from one receptor to another and from one impact to another.
13. In accordance with the accepted industry approach, the impact assessments have been undertaken based on a realistic worst-case scenario of predicted impacts, which are set out within each topic chapter. The project design envelope for the proposed White Cross Wind Farm project is detailed in **Chapter 5: Project Description**.

25.2.3 Study Area

14. Details of the location of the Onshore Project and the onshore infrastructure are set out within **Chapter 5: Project Description**.
15. The inter-relationships study area is defined by the distance over which impacts from all the Onshore Project infrastructure (i.e. Onshore Export Cable Corridor, Onshore Substation, and Landfall) may occur and by the location of any receptors that may be affected by those potential impacts.

25.2.4 Approach to Assessment

16. Inter-relationship effects are covered as part of the assessment and consider impacts from the construction, operation or decommissioning of the Onshore Project

on the same receptor (or group). A description of the process to identify and assess these effects is presented in **Chapter 6: EIA Methodology**. The assessment of inter-relationships only considers impacts scoped in for assessment within environmental topic chapters. The potential inter-relationship effects that could arise include both:

- **Project lifetime effects:** Effects arising throughout more than one phase of the Onshore Project (construction, operation, and decommissioning) to interact to potentially create a more significant effect than if just one phase were assessed in isolation
- **Receptor led effects:** Assessment of the scope for all relevant effects to interact, spatially and temporally, to create inter-related effects on a receptor (or group). Receptor-led effects might be short term, temporary or transient effects, or incorporate longer term effects.

25.3 Assessment of Impacts

25.3.1 Inter-relationships that impact Marine and Coastal Processes

17. Potential inter-relationship impacts that are relevant to marine and coastal processes during construction are:
 - Impacts on the form and function of the coast above MLWS due to cable installation. Disruption to coastal morphology could affect these receptors by altering the existing sedimentary environment. However, this is unlikely to be at levels which are significant
 - Impacts on suspended sediment concentrations due to cable installation. Suspended sediment could be contaminated and could cause disturbance to fish and benthic species through smothering.
18. Inter-relationships for effects during the decommissioning phase will be the same as those outlined above for the construction phase. No inter-relationships have been identified during the operation and maintenance phase.

Although the impacts assessed in **Chapter 8: Marine and Coastal Processes** have the potential to impact a number of other receptors, no inter-relationships have been identified where an accumulation of residual effects on Marine and Coastal Processes and the relationship between those effects give rise to effects of greater significance. When assessed individually, all effects were assessed as negligible or had no effect. Effects were not significant due to the low magnitude of

effects and low sensitivity of the receptors. For the impacts assessed, no mitigation was required, therefore there is no need for additional mitigation. For further details see **Chapter 8: Marine and Coastal Processes**.

25.3.2 Inter-relationships that impact Marine Water and Sediment Quality

19. Potential inter-relationship impacts that are relevant to Marine Water and Sediment Quality during construction are:
 - Effects on suspended sediment concentrations and potential mobilisation of contaminants. Suspended sediment could cause disturbance to fish and turtles by causing a barrier to movement and benthic species through smothering. Sediments may also be contaminated which could harm fish, turtles and benthic species. Marine mammals may be affected through changes in prey availability. Suspended sediments (which may also contain contamination) may affect beach users during construction of the cable in the inshore area.
20. Inter-relationships for impacts during the decommissioning phase will be the same as those outlined above for the construction phase. No inter-relationships have been identified during the operation and maintenance phase.
21. All effects have been assessed in **Chapter 9: Marine Water and Sediment Quality** as negligible, with residual effects also being negligible. This is due to the low sensitivity of the water quality in the offshore area and the negligible magnitude of impacts. No inter-relationships have been identified where an accumulation of residual effects on marine water and sediment quality and the relationships between those effects give rise to effects of greater significance. Therefore, there is no need for additional mitigation.

25.3.3 Inter-relationships that impact Benthic and Intertidal Ecology

22. Potential inter-relationship impacts that are relevant to Benthic and Intertidal Ecology during construction and operation are:
 - Habitat loss through temporary alteration of the seabed could potentially disturb the form and function of the seabed (e.g., sand waves) – **Chapter 8: Marine and Coastal Processes**
 - Changes in suspended sediment concentrations and associated sediment deposition resulting in potential impacts on benthic habitats and species – **Chapter 8: Marine and Coastal Processes**

- Re-mobilisation of contaminated sediments and associated deposition could have potential impacts on benthic habitats and species. **Chapter 9: Marine Water and Sediment Quality** provides an assessment of the potential for contaminants to be present in the study area
 - A number of benthic species are prey for fish and shellfish. Therefore, impacts on benthic ecology can lead to indirect impacts on fish and shellfish (this is considered in the separate Offshore Project ES).
23. Inter-relationships for impacts during the decommissioning phase will be the same as those outlined above for the construction phase.
24. **Chapter 10: Benthic and Intertidal Ecology** concludes the effects from impacts on benthic and intertidal ecology during the construction, operation and decommissioning of the Onshore Project were negligible or not significant. Effects were assessed as negligible, due to the resilience of majority of receptors being high and having a low sensitivity to impacts. Many of the impacts assessed are also temporary and highly localised.

25.3.4 Inter-relationships that impact Marine Mammal and Marine Turtle Ecology

25. **Chapter 11: Marine Mammal and Marine Turtle Ecology** outlines that upon consideration of the baseline environment above MLWS, the project description outlined in **Chapter 5: Project Description**, and the Scoping Opinion (Case reference: EIA/2022/00002), all potential impacts marine mammals and marine turtles have been scoped out. Therefore, potential inter-relationship impacts relevant to Marine Mammal and Marine Turtle Ecology are not considered.

25.3.5 Inter-relationships that impact Ground Conditions and Contamination

26. Potential inter-relationship impacts during construction and decommissioning that are relevant to Ground Conditions and Contamination Land are:
- Exposure of construction workers, maintenance workers, neighbouring site users and future site users to contaminated soils and groundwater and associated health impacts. No additional inter-related effects to human health have been identified for these receptors during construction which would increase the standalone assessment from minor adverse (and not significant in EIA terms)
 - Direct impacts on groundwater quality and groundwater resources. Any project-related changes to ground conditions and contaminated land (both physically

and chemically) during construction could impact on the quantity and quality of groundwater resources and hydrologically connected surface water receptors

- Impacts on surface water quality and the ecological habitats they support from contamination. Potential changes to the quantity and quality of groundwater resources and any hydrologically connected surface water during construction could impact upon water dependent biological features, inclusive of designated sites
- Impacts on Agricultural Land. Potential contamination of agricultural land during the construction phase could impact on the Agricultural Land Classification (ALC) grade and productivity of agricultural land. This is also assessed in **Chapter 15: Land Use**.

27. Potential inter-relationship impacts during operation and maintenance that are relevant to Ground Conditions and Contamination Land are:

- Exposure of maintenance workers and future site users not involved with the project to contaminated soils and groundwater and associated health impacts.
- Impact on Controlled Waters (groundwater and surface waters) have the potential to also impact on water dependent biological features. However, no additional inter-related impacts on controlled waters have been identified
- Impacts on Agricultural Land. Potential contamination of agricultural land during the operational phase could impact on the ALC grade and productivity of agricultural land. This is also assessed in **Chapter 15: Land Use**.

28. **Chapter 12: Ground Conditions and Contamination** concludes that residual effects are minor adverse with mitigation measures. No inter-relationships have been identified where an accumulation of residual effects on ground conditions and contamination give rise to effects of greater significance. Therefore, due to the embedded mitigation that has been proposed, there is no requirement for additional mitigation.

25.3.6 Inter-relationships that impact Air Quality

29. Potential inter-relationship impacts during construction and decommissioning that are relevant to Air Quality are:

- Construction dust and fine particulate matter. There could be the potential for human health impacts associated with increases in pollutant concentrations at sensitive receptors. This is assessed in **Chapter 22: Human Health**.
- Non-Road Mobile Machinery (NRMM) emissions There could be the potential for human health and ecological impacts associated with NRMM emissions. This is

assessed in **Chapter 16: Onshore Ecology and Ornithology** and **Chapter 22: Human Health**.

- Construction road vehicle exhaust emissions. Potential ecological and human health receptors may be impacted by changes to air quality resulting from construction road vehicle exhaust emissions. This is assessed in **Chapter 16: Onshore Ecology and Ornithology** and **Chapter 22: Human Health**.
30. No inter-relationships have been identified during the operation and maintenance phase.
31. **Chapter 13: Air Quality** indicates all effects are not significant with mitigation and therefore concluded there is no potential for interactions between effects. No inter-relationships have been identified where an accumulation of residual effects on Air Quality give rise to effects of greater significance. Therefore, due to the embedded mitigation that has been proposed, there is no need for additional mitigation.

25.3.7 Inter-relationships that impact Water Resources and Flood Risk

32. Potential inter-relationship effects that could arise in relation to Water Resources and Flood Risk include impacts on the quality and quantity of groundwater. Potential changes to ground conditions (including chemical quality and physical properties such as transmissivity) could affect the quality and quantity of groundwater and where hydrologically connected surface water receptors. Impacts could occur in all phases of the Onshore Project.
33. There is also the potential impact to water dependant habitats and designated sites. Potential changes to the hydrology, geomorphology and water quality of designated sites could impact upon water-dependent biological communities, including the designated interest features.
34. Impacts associated with the decommissioning phase would be no greater than those identified for the construction phase.
35. All potential effects have been assessed in **Chapter 14: Water Resources and Flood Risk** as minor adverse with only direct disturbance to surface water bodies being assessed as moderate adverse. No inter-relationships have been identified where an accumulation of residual effects on Water Resources and Flood Risk and the relationships between those effects give rise to effects of greater significance. Therefore, there is no need for additional mitigation.

25.3.8 Inter-relationships that impact Land Use

36. Potential inter-relationship construction impacts in relation to Land Use and Agriculture include:

- Impacts on drainage could lead to changes in flood risk or water resources e.g. private water supplies – **Chapter 14: Water Resources and Flood Risk**
- Changes in land uses could impact on ecological receptors, for example the removal of trees or hedgerows or the loss of agricultural land – **Chapter 21: Socio-economics (including Tourism and Recreation)**
- Changes in soil quality could impact on ground conditions and potentially contaminated land – **Chapter 12: Ground Conditions and Contamination.**
- Changes in soil quality and quantity could impact on ecological receptors – **Chapter 16: Onshore Ecology and Ornithology**
- Impacts to Environmental Stewardship Schemes and disruption to Users of Recreational Routes **Chapter 21: Socio-economics (including Tourism and Recreation).**

Potential operation and maintenance impacts in relation to Land Use are:

- Disruption to Field Drainage – **Chapter 14: Water Resources and Flood Risk**
- Permanent loss of land for agriculture, Environmental Stewardship Schemes, and disruption to Users of Recreational Routes **Chapter 21: Socio-economics (including Tourism and Recreation).**

37. Impacts associated with the decommissioning phase would be no greater than those identified for the construction phase.

38. All effects have been assessed in **Chapter 15: Land Use** as moderate to minor adverse. No inter-relationships have been identified where an accumulation of residual effects on Land Use and the relationships between those effects give rise to effects of greater significance. Therefore, there is no need for additional mitigation.

25.3.9 Inter-relationships that impact Onshore Ecology and Ornithology

39. The potential inter-relationship impacts in relation to Onshore Ecology and Ornithology are:

- Direct and indirect damage and disturbance of Braunton Burrows Special Area of Conservation (SAC) / Site of Special Scientific Interest (SSSI):

- **Chapter 8: Marine and Coastal Processes** and **Chapter 10: Benthic and Intertidal Ecology** - Disturbance to beach topography and movement of sediment along / down the beach could impact on the flora and fauna communities
 - **Chapter 13: Air Quality** – Considers effects on air quality resulting from construction activities / traffic
 - **Chapter 12: Ground Conditions and Contamination** and **Chapter 14: Water Resources and Flood Risk** – Considers accidental leaks and spills, frac out and other hydrological pollution through impacts on groundwater and surface water.
- Direct and indirect disturbance of Taw-Torridge Estuary SSSI:
 - **Chapter 12: Ground Conditions and Contamination** and **Chapter 14: Water Resources and Flood Risk** – Considers accidental leaks and spills, frac out and other hydrological pollution through impacts on groundwater and surface water
 - **Chapter 13: Air Quality:** Considers effects from air quality (i.e. Nitrogen Oxides (NO_x), Nitrogen-deposition on habitats/dusk) resulting from traffic and machinery during construction.
 - Indirect impacts to Greenaways and Freshmarsh, Braunton SSSI:
 - **Chapter 13: Air Quality** - Considers effects from air quality (i.e. NO_x, Nitrogen-deposition on habitats/dusk) resulting from traffic and machinery during construction.
 - Indirect impacts to Saunton to Baggy Point Coast SSSI:
 - **Chapter 13: Air Quality** - Considers effects from air quality (i.e. NO_x, Nitrogen-deposition/dust) on habitats resulting from traffic and machinery during construction.
 - Temporary habitat loss affecting non-statutory designated sites (and associated habitats):
 - **Chapter 12: Ground Conditions and Contamination** and **Chapter 14: Water Resources and Flood Risk** - Considers potential changes to ground conditions that could affect groundwater and hydrologically-connected surface water receptors, and related habitat that rely on these water sources.

- Removal of sections of hedgerow:
 - **Chapter 20: Onshore Landscape and Visual Amenity** - Hedgerows to be lost or coppiced during construction will be re-established following completion of the Onshore Project.
 - Temporary loss/disturbance to ditches, riparian habitats and watercourses:
 - **Chapter 12: Ground Conditions and Contamination** and **Chapter 14: Water Resources and Flood Risk** - Considers changes to watercourses during construction.
 - Disturbance to over-wintering birds, and destruction, damage, or disturbance of over-wintering birds' habitats:
 - **Chapter 18: Noise and Vibration** - Construction activities will result in new sources of noise and ground vibration. These have the potential to impact nearby over-wintering bird assemblages.
 - Indirect impacts on ancient woodland and Fremington Local Nature Reserve (LNR):
 - **Chapter 13: Air Quality** - Considers effects from air quality (i.e. NO_x, Nitrogen-deposition/dust) on habitats resulting from traffic during construction.
40. **Chapter 16: Onshore Ecology and Ornithology** concluded that residual effects were minor adverse or negligible after mitigation measures have been applied. No inter-relationships have been identified where an accumulation of residual effects on onshore ecology and ornithology give rise to effects of greater significance. Therefore, due to the embedded mitigation that has been proposed, there is no requirement for additional mitigation.

25.3.10 Inter-relationships that impact Onshore Archaeology and Cultural Heritage

41. Potential inter-relationship impacts in relation to Onshore Archaeology and Cultural Heritage in terms of construction are:
- Change to the setting of heritage assets. Potential impacts on nearshore, intertidal, and coastal archaeology and cultural heritage – **Chapter 16: Marine Archaeology and Cultural Heritage** of the Offshore Project Section 36 Application

- Indirect (physical) impacts on designated and non- designated heritage assets. Potential impacts resulting from changes to ground conditions affecting buried archaeological deposits – **Chapter 14: Water Resources and Flood Risk**
 - Potential for vibration from groundworks/construction traffic affecting the fabric of a heritage asset – **Chapter 19: Traffic and Transport**
 - Potential impacts related to noise and vibration could impact on the setting of heritage assets – **Chapter 18: Noise and Vibration**
 - Potential impacts with respect to visual receptors along the coast which could also represent potential impacts to the setting of heritage assets – **Chapter 19: Seascape, Landscape and Visual Amenity** of the Offshore Project Section 36 Application and **Chapter 20: Onshore Landscape and Visual Amenity.**
42. Potential inter-relationship impacts in relation to Onshore Archaeology and Cultural Heritage in terms of operation and maintenance are:
- Potential impacts related to noise and vibration could impact on the setting of heritage assets – **Chapter 18: Noise and Vibration**
 - Potential impacts with respect to landscape and visual receptors which could also represent potential impacts to the setting of heritage assets – **Chapter 20: Onshore Landscape and Visual Amenity.**
43. In **Chapter 17: Onshore Archaeology and Cultural Heritage**, mitigation measures are described for the potential impacts on these receptors. The assessments examining the potential interaction impacts suggest effects are of no greater significance than when individually assessed. No inter-relationships have been identified where an accumulation of residual effects on onshore archaeology give rise to effects of greater significance. Therefore, there is no need for additional mitigation.

25.3.11 Inter-relationships that impact Noise and Vibration

44. Potential inter-relationship impacts in relation to Noise and Vibration in terms of construction are:
- Potential for noise impacts on ecological receptors, which have been addressed separately in **Chapter 16: Onshore Ecology and Ornithology**
 - Potential noise impacts on socio-economics, which have been addressed separately in **Chapter 21: Socio-economics (including Tourism and Recreation)**

- Increase in noise or vibration levels at Noise and Vibration Sensitive Receptors (NVSRs) associated with the Onshore Project having the potential to result in human health effects
 - Noise emissions from traffic movements associated with construction of the Onshore Project having the potential to impact on local amenity.
45. Inter-relationships for noise impacts during the operation and maintenance phase include:
- Potential noise impacts at ecological receptors addressed separately in **Chapter 20 Onshore Ecology and Ornithology**.
 - Potential noise impacts addressed separately in **Chapter 21: Socioeconomics (including Tourism and Recreation)**.
 - Increase in noise or vibration levels at NVSRs associated with White Cross have the potential to result in human health effects are assessed in **Chapter 22: Human Health**.
46. The decommissioning phase will be the same as those outlined above for the construction phase or likely to have less impact than construction phase impacts.
47. All potential effects have been assessed in **Chapter 18: Noise and Vibration** as negligible or minor adverse with residual effects also being negligible or minor adverse. This is due to the negligible magnitude of impacts and proposed mitigation measures. No inter-relationships have been identified where an accumulation of residual effects on Noise and Vibration and the relationships between those effects give rise to effects of greater significance. Therefore, there is no need for additional mitigation.

25.3.12 Inter-relationships that impact Traffic and Transport

48. Potential inter-relationship impacts in relation to Traffic and Transport in terms of construction are:
- Traffic associated with construction may impact the local demography – **Chapter 21: Socio-economics (including Tourism and Recreation)**
 - Traffic has the potential to temporarily affect air quality and impact upon local residents – **Chapter 13: Air Quality**
 - Traffic has the potential to increase noise disturbance temporarily – **Chapter 18: Noise and Vibration**
 - Traffic associated with construction may impact the local demography – **Chapter 21: Socio-economics (including Tourism and Recreation)**

- Traffic associated with construction may generate localised dust emissions leading to potential complaints – **Chapter 22: Human Health.**
49. Inter-relationships for effects during the decommissioning phase will be the same as those outlined above for the construction phase.
50. All inter-relationship effects assessed within **Chapter 19: Traffic and Transport** were found to be no greater than individually assessed effects. When assessed individually, all effects were assessed as being between negligible to moderate adverse. However, with proposed mitigation measures all residual effects were assessed as being between negligible and minor adverse. Effects were not significant due to the low magnitude of impacts.

25.3.13 Inter-relationships that impact Onshore Landscape and Visual Amenity Impacts

51. Potential inter-relationship impacts in relation to Onshore Landscape and Visual Amenity Impacts are:
- **Chapter 16: Onshore Ecology and Ornithology** - Potential impacts on physical landscape features, hedgerow and tree removals; the Landscape and Visual Amenity Impacts (LVIA) considering the impact as landscape elements, and the Onshore Ecology assessment considering the impact on ecological assets. Both chapters consider the mitigation of loss in respect of planting proposed as outline landscape mitigation principles
 - **Chapter 17: Onshore Archaeology and Cultural Heritage** - Both chapters consider the potential effects of the Onshore Infrastructure on cultural heritage assets and their setting within the landscape
 - **Chapter 21: Socio-economics (including Tourism and Recreation)** - Both chapters consider the potential effects of the Onshore Infrastructure on recreational receptors in the local area.

25.3.14 Inter-relationships that impact Socio-Economics (including Tourism and Recreation)

52. Potential inter-relationship impacts in relation to Socio-Economics impacts in terms of construction are:
- Construction of the Onshore Infrastructure impacting on existing economic activity by affecting land use – **Chapter 19: Land Use**
 - Traffic resulting from the Onshore Infrastructure could restrict or affect access to tourism and recreation assets – **Chapter 23: Traffic and Transport**

- Construction of the Onshore Infrastructure could result in landscape and visual impacts affecting recreation and tourism assets – **Chapter 20: Onshore Landscape and Visual Amenity.**
53. Potential inter-relationship impacts in relation to Socio-Economics impacts in terms on operation and maintenance are:
- The presence of the Onshore Infrastructure could result in permanent changes in land use, having an economic impact on existing users – **Chapter 19: Land Use**
 - The presence of the Onshore Infrastructure could result in landscape and visual impacts affecting recreation and tourism assets – **Chapter 20: Onshore Landscape and Visual Amenity.**
54. All potential interaction effects assessed within **Chapter 21: Socio-Economics (including Tourism and Recreation)** were found to be no greater than individually assessed effects. All were assessed as negligible to minor adverse. When assessed individually, all effect were assessed as negligible, with effects being assessed as beneficial.

25.3.15 Inter-relationships that impact Human Health

55. Potential inter-relationship impacts during construction and decommissioning that are relevant to Human Health are:
- Impact on open space, leisure and play (access). Access to blue and green space is a determinant of health. Also considered in **Chapter 15: Land Use.**
 - Noise impacts. Increase in noise or vibration levels at Noise and Vibration Sensitive Receptors (NVSRs) associated with the Onshore Project having the potential to result in human health effects. Also considered in **Chapter 18: Noise and Vibration**
 - Air quality impacts. There could be the potential for human health impacts associated with increases in pollutant concentrations at sensitive receptors. This is assessed in **Chapter 13: Air Quality**
 - Journey times and / or reduced access effects. This is assessed in **Chapter 19: Traffic and Transport.**
56. Inter-relationships identified during the operation and maintenance phase include:
- Open space, leisure and play (access). Also considered in **Chapter 15: Land Use.**

- Impact on wider societal infrastructure Also considered in **Chapter 23: Climate Change**

57. **Chapter 22: Human Health** assessments indicate all potential effects are not significant with mitigation and concluded there is no potential for interactions between effects. No inter-relationships have been identified where an accumulation of residual effects on Human Health give rise to effects of greater significance. Therefore, due to the embedded mitigation that has been proposed, there is no need for additional mitigation.

25.3.16 Inter-relationships that impact Climate Change

58. The receptor for the Greenhouse Gas (GHG) assessment is the global atmosphere, therefore there are no inter-relationships with other environmental effects. There are also not considered to be any inter-relationships for the aspects covered in the Climate Change Risk Assessment (CCRA), with other environmental effects related to the Onshore Project.

25.4 Summary

59. This chapter has summarised the potential inter-relationships effects from the Onshore Project during construction, operation, maintenance, and decommissioning. The range of potential impacts and associated effects considered has been informed by the Scoping Opinion, consultation, and agreed through ETG Meetings, as well as reference to existing policy and guidance. The impacts considered include those brought about directly as well as indirectly.
60. The specific aim of the inter-relationships assessment has been to identify where the accumulation of residual effects on a single receptor, and the relationship between those impacts, gives rise to additional impacts or effects of greater significance. In doing so, this has ensured that the environmental impacts of the Onshore Project as a whole have been addressed.
61. A number of inter-relationships have been identified. Where appropriate, the inter-related impact on a given receptor has been found to be assessed in detail in the relevant ES chapter and none of the inter-relationships identified suggest the need for additional mitigation over and above that which is already identified within each ES chapter.